

Appendix D

Wetlands



SOIL & WATER TESTING SERVICES, LLC.

**WETLAND DETERMINATION
&
DELINEATION REPORT**

For The:

**PROPOSED ARMORY AREA
DETENTION BASIN**

City of Oshkosh, Winnebago County



SOIL & WATER TESTING SERVICES, LLC.

February 21, 2012

Joey Shoemaker
US Army Corps of Engineers
Suite 211, Old Ft. Square
211 North Broadway
Green Bay, WI 54303-2757

RECEIVED

FEB 23 2012

DEPT. OF PUBLIC WORKS
OSHKOSH, WISCONSIN

Re: Wetland Determination/Delineation - Proposed Armory Area Detention Basin
City of Oshkosh, Winnebago County

Dear Mr. Shoemaker:

On behalf of the City of Oshkosh, please find enclosed a Wetland Determination & Delineation Report. This report is intended to serve as a request for an approval on the wetland area identified from the Wisconsin Department of Natural Resources and the Department of Army, Army Corps of Engineers.

If you have any questions or comments regarding this report or work performed, please call me at 920-779-0000.

Respectfully submitted,
Bates Soil & Water Testing Services, LLC.

Brian D. Bates, P.S.S.
Licensed Professional Soil Scientist/Hydrogeologist



cc: Brenda Nordin, WDNR-Oshkosh
James Rabe, P.E., CPESC, City of Oshkosh - Department of Public Works

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The U.S. Army Corps of Engineers and U.S. Environmental Protection Agency
wetland definition is:

“Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.”

INTRODUCTION & OBJECTIVE

On October 23, 2011, Bates Soil & Water Testing Services, LLC. performed a wetland investigation for the subject property. The investigation was conducted by Brian Bates and Tom Neitzel, both Licensed Professional Soil Scientists in the State of Wisconsin. The survey map was provided by the City of Oshkosh, Department of Public Works.

The property is located in the SE & SW 1/4 of the NW 1/4, Section 27, T18N, R16E, City of Oshkosh, Winnebago County. The objective of the wetland determination and delineation was to determine if there were any wetland areas on the property for a proposed detention basin.

Most wetlands are considered waters of the United States and are subject to regulation under the Clean Water Act (CWA). Non-Isolated wetlands are regulated under Section 404 of the CWA and regulated by the United States Army Corps of Engineers (USACE). The Wisconsin Department of Natural Resources (WDNR) has regulatory authority over wetlands, navigable waters, and adjacent lands under Chapter 30 Wisconsin State Statutes, Act 6, and NR 103 Wisconsin Administrative Code.

METHODOLOGY

The initial steps for the wetland determination and delineation included a preliminary reconnaissance (walk through) of the property and a review of the following documents:

- Soil Survey of Winnebago County
- Natural Resources Conservation Service Hydric Soil List for Winnebago County
- Wisconsin Department of Natural Resources Wetland Inventory Map
- Reconnaissance Survey (observe land use, vegetation, hydrology influences, site alterations, etc.)

These steps provided information on where wetlands have been previously identified or areas that possess a high likelihood of wetlands occurring. Wetland areas or areas with wetland potential were then field investigated to make on-site determinations and where necessary, complete delineations of the uppermost wetland boundary.

Wetland determinations were made using the criteria and methods outlined in the "Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual" Northcentral and Northeast Region (October 2009). The Quadrat Sampling Method was used and consisted of 5' radius for Herb Layer, 15' radius for Sapling/Shrub Layer and 30' radius for Trees. Absolute Cover was based on Stem Density. Plants observed during the investigation were identified to the Species Level. The "50/20" rule was used for determining major plant dominance unless the Prevalence Index was required.

SITE DISCUSSION & RESULTS

The objective of the wetland determination and delineation was to determine if there were any wetland areas on the property for a proposed detention basin. Fourteen test plots were evaluated. The associated USACE data sheets are provided in Appendix A.

Soils in the vicinity of the investigation are mapped as Manawa Silty Clay Loam (MnA), Kewaunee Silt Loam (KnB) and Omro Clay Loam (OmB). None of these soils are classified as hydric, however they possibly may have hydric inclusions. The Wisconsin Wetland Inventory Map did not identify any wetlands on the property. The Wetland Inventory Map did identify the potential for wetlands in the area of the Manawa Silty Clay Loam soils.

Photographs of the site are provided in Appendix B. Soil Survey Excerpts are provided in Appendix C and a Hydric Soil List is provided in Appendix D.

Precipitation averages from the National Climatic Center in Green Bay for 2011 (closest observation point) were compared to the NRCS WETS Table for Winnebago County. Based on this comparison, the precipitation average was above normal for September and October and very close to normal for August.

	2011 Monthly Average	WETS Table Monthly Average
August	3.97"	4.15"
September	3.37"	3.36"
October	2.65"	2.20"

CONCLUSIONS

The objective of the wetland determination and delineation was to determine if there were any wetland areas on the property for a proposed detention basin. Three wetland areas were identified, having a combined size total of 0.88 acres. The eastern portion of the property is owned by the State of Wisconsin, 1415 Armory Place, Oshkosh, WI, 54902, Telephone Number. 920-424-2439. The western portion of the property is owned by 2323 East Capitol, LLC., 1530 S. Koeller Street, Oshkosh, WI 54901, Telephone Number 920-233-7219.

The information provided within this report is an excellent estimate of the wetland area identified. However, these judgements are based on field data at the time the wetland was reviewed. Ultimately, the final decision rests with the WDNR and USACE. Therefore, Bates Soil & Water Testing Services, LLC., will submit copies of this report to both agencies for review.

It is recommended that the Client obtain written authorization from both regulating agencies prior to proceeding with any development or utilization of the property, especially where permits are required.

BIBLIOGRAPHY

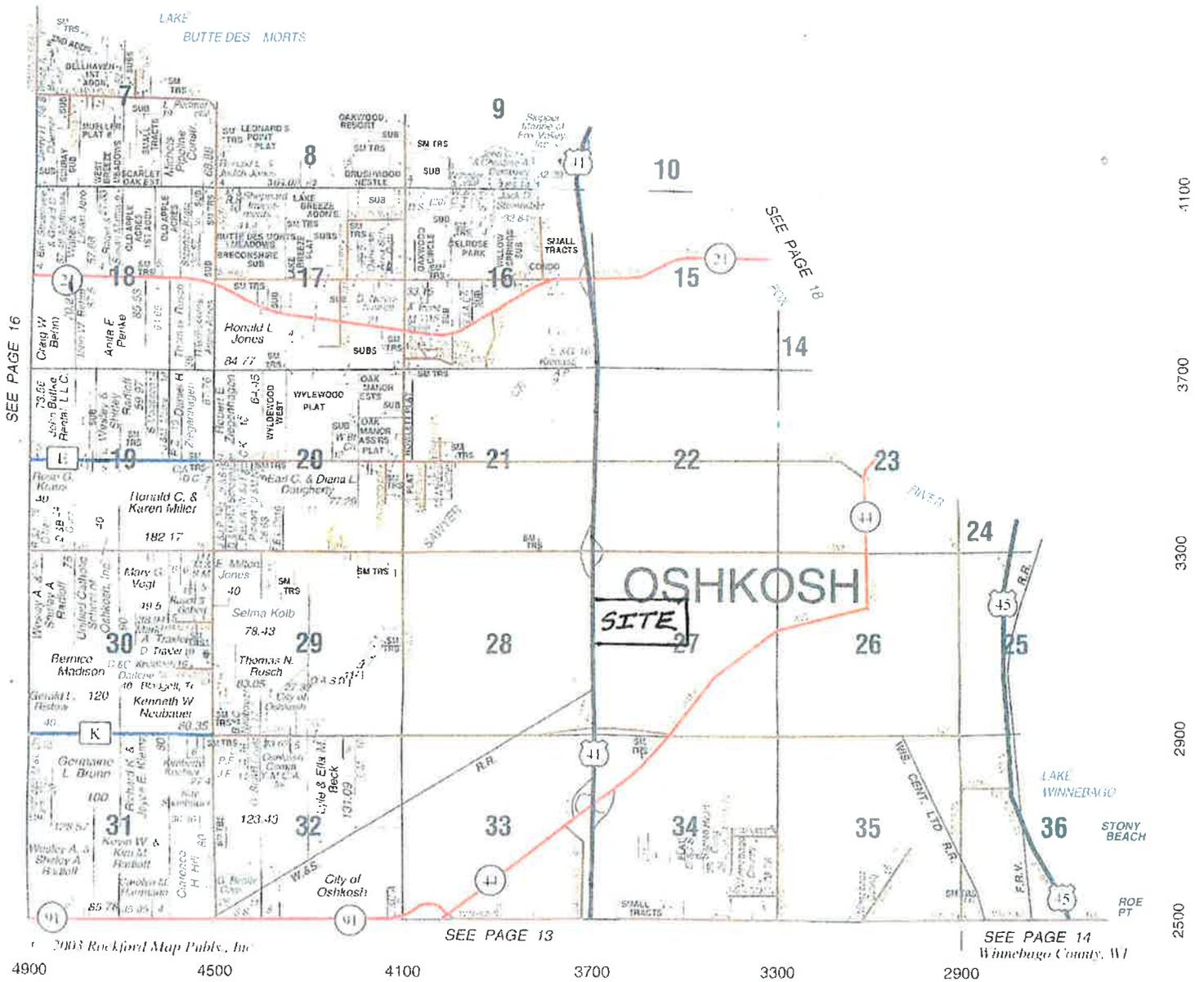
Bates Soil & Water Testing Services, LLC. was founded in 1996 and is owned and operated by Brian Bates. Mr. Bates consults on multiple disciplines associated with the soils and waters of Wisconsin. Wetland related disciplines include wetland delineations, wetland hydrology monitoring, wetland restoration and invasive plant control.

Mr. Bates is a Soil Scientist and a Hydrogeologist with a Bachelors Degree in Soil Science and a Master's Degree in Natural Resources - Hydrogeology emphasis, from the University of Wisconsin-Stevens Point. He is a Certified Soil Tester and a Licensed Professional Soil Scientist. In 1991, Mr. Bates was recognized as one of the "Top Ten" Soil Profile Evaluators in the nation, recognized at a collegiate level, National Soil Judging Contest held in California.

Additional continuing education training includes the Basic Wetland Delineation course offered by the Wisconsin Department of Administration, Coastal Management Program (1998), Critical Methods in Wetland Delineation seminar offered by the Wisconsin Department of Natural Resources (2010) and the Advanced Wetland Delineation Training Workshop offered by the University of Wisconsin-LaCrosse (2010). Mr. Bates is also a member of the Wisconsin Society of Professional Soil Scientists.

ALGOMA

T.18N.-R.16E.



WETLAND DELINEATION FOR THE PROPOSED ARMORY AREA DETENTION BASIN

CITY OF OSHKOSH
WINNEBAGO COUNTY

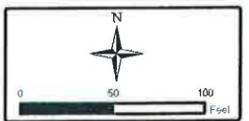
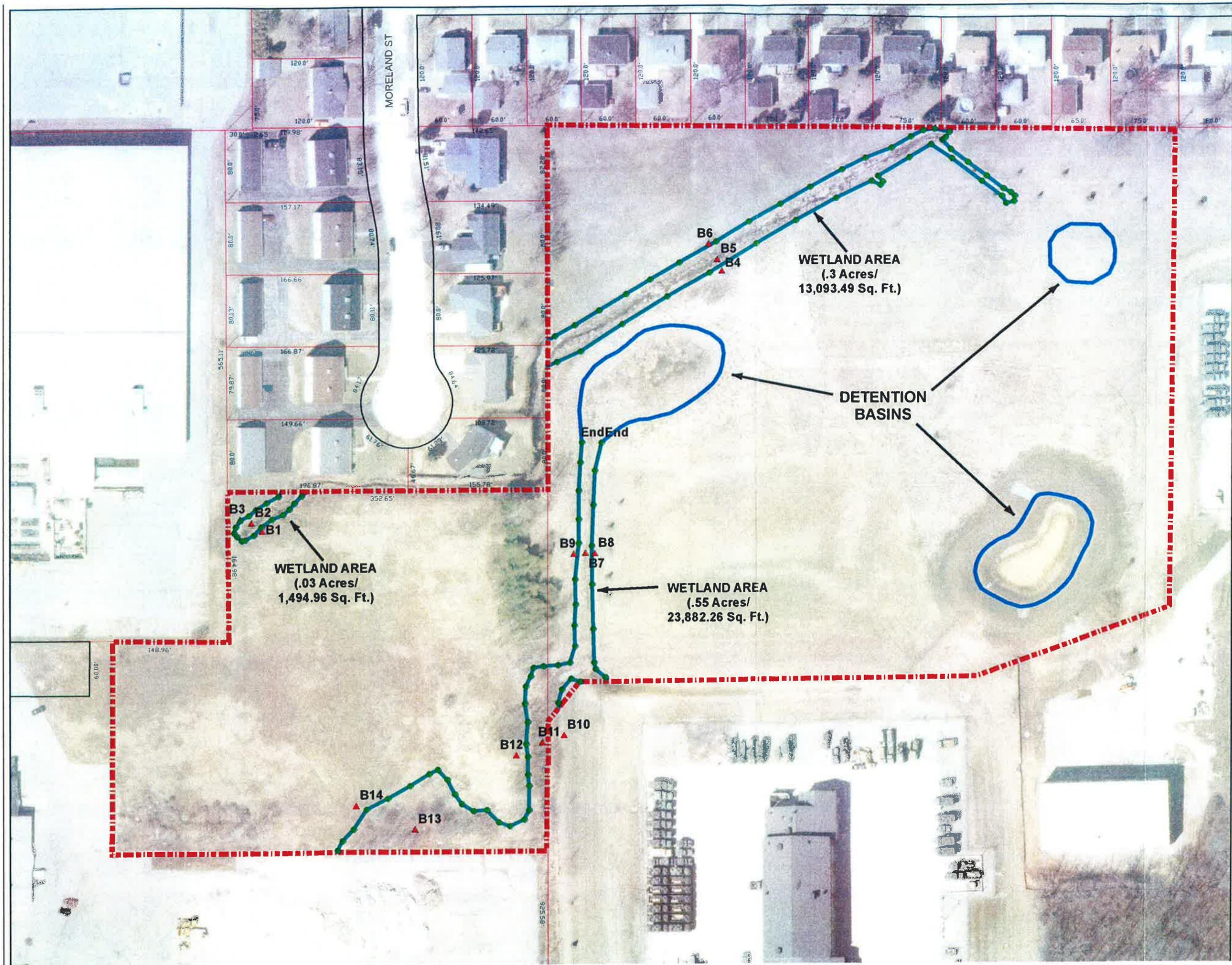
SE 1/4 OF NW 1/4 OF SECTION 27 OF
TOWN 18N OF RANGE 16E

&
SW 1/4 OF NW 1/4 OF SECTION 27 OF
TOWN 18N OF RANGE 16E

CITY OF OSHKOSH

Legend

- ▲ Wetland Test Holes
- Boundary Flags
- Limits of Investigation
- Detention Basin
- Wetland Boundary
- Right-of-Way
- City Parcels



I:\Engineering\12-01 Armory Area
Det Basin\GIS\Wetland Short
Base Map.mxd

APPENDIX A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B1
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): HILLSLOPE (DITCH SIDE) Local relief (concave, convex, none): NONE
 Slope (%): 20 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLLC HAPLUDALF) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B1

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____ = Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. PHALARIS ARUNDINACEA	15	N	FACW	
2. SOLIDAGO ALTISSIMA	35	Y	FACU	
3. ERYNGIUM YUCCIFOLIUM	5	N	FAC	
4. VITIS RIPARIA	5	N	FACW	
5. CIRSIUM ARVENSE	2	N	FACU	
6. RUMEX CRISPUS	20	Y	FAC	
7. RHAMNUS CATHARTICA	5	N	FAC	
8. POA PRATENSIS	10	N	FAC	
9. CAREX species	10	N	FACW*	
10. _____				
11. _____				
12. _____				
	_____ = Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
	_____ = 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 25 x 2 = 50
 FAC species 40 x 3 = 120
 FACU species 37 x 4 = 148
 UPL species _____ x 5 = _____
 Column Totals: 102 (A) 318 (B)
 Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)
***NO SPIKELETS OBSERVED. ASSUMED FACW OR WETTER.**

SOIL

Sampling Point: B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10 YR 3/3	100					SIL	MIXED SILT LOAM FILL WITH 30% GRAVEL AND COBBLES
			</					

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B2
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): BOTTOM OF DITCH Local relief (concave, convex, none): CONCAVE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLIC HAPLUDALF) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<p><u>Secondary Indicators (minimum of two required)</u></p> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<p>Field Observations:</p> Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<p>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____</p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B2

<u>Tree Stratum</u> (Plot size: _____)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				_____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				
1. SALIX EXIGUA	60	Y	OBL	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				60 = Total Cover
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. PHALARIS ARUNDINACEA	85	Y	FACW	
2. CIRSIUM ARVENSE	5	N	FACU	
3. SOLIDAGO GIGANTEA	5	N	FACW	
4. VITIS RIPARIA	5	N	FACW	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
				100 = Total Cover
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				_____ = 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

<u>Total % Cover of:</u>	<u>Multiply by:</u>
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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B3
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): HILLSLOPE (DITCH SIDE) Local relief (concave, convex, none): NONE
 Slope (%): 20 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLIC HAPLUDALF) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:33%;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:33%;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td style="width:33%;"><input type="checkbox"/> Surface Soil Cracks (B6)</td> </tr> <tr> <td><input type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> <td><input type="checkbox"/> Drainage Patterns (B10)</td> </tr> <tr> <td><input type="checkbox"/> Saturation (A3)</td> <td><input type="checkbox"/> Marl Deposits (B15)</td> <td><input type="checkbox"/> Moss Trim Lines (B16)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> <td><input type="checkbox"/> Dry-Season Water Table (C2)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> <td><input type="checkbox"/> Crayfish Burrows (C8)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> <td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> <td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> <td><input type="checkbox"/> Geomorphic Position (D2)</td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> <td><input type="checkbox"/> Shallow Aquitard (D3)</td> </tr> <tr> <td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td> <td></td> <td><input type="checkbox"/> Microtopographic Relief (D4)</td> </tr> <tr> <td></td> <td></td> <td><input type="checkbox"/> FAC-Neutral Test (D5)</td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)			<input type="checkbox"/> FAC-Neutral Test (D5)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)																																
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)																																
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<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)																																
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<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)																																
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)																																
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)																																
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)																																
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		<input type="checkbox"/> FAC-Neutral Test (D5)																																
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>																																	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																																		
Remarks:																																		

VEGETATION – Use scientific names of plants.

Sampling Point: B2

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				_____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				
1. SALIX EXIGUA	40	Y	OBL	
2. ACER NEGUNDO	15	Y	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
				55 = Total Cover
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. PHALARIS ARUNDINACEA	40	Y	FACW	
2. CIRSIUM ARVENSE	10	N	FACU	
3. SOLIDAGO ALTISSIMA	5	N	FACU	
4. POA PRATENSIS	10	N	FAC	
5. RUMIX CRISPUS	15	N	FAC	
6. ERYNGIUM YUCCIFOLIUM	5	N	FAC	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
				85 = Total Cover
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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:

___ Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

___ Prevalence Index is ≤3.0¹

___ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No _____

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B4
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): HILLSLOPE (DITCH SIDE) Local relief (concave, convex, none): NONE
 Slope (%): 20 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLLC HAPLUDALF) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B4

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
Herb Stratum (Plot size: <u>5'</u> _____)				
1. PHALARIS ARUNDINACEA	25	Y	FACW	
2. CIRSIUM ARVENSE	5	N	FACU	
3. DAUCUS CAROTA	5	N	NI	
4. BROMUS INERMIS	35	Y	NI	
5. FESTUCA ARUNDINACEA	30	Y	FACU	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	100 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes _____ No ✓

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B5
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): DEPRESSION/DITCH BOTTOM Local relief (concave, convex, none): CONCAVE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLIC HAPLUDALF) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ___ Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) ___ Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B5

<u>Tree Stratum</u> (Plot size: _____)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____ = Total Cover			
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. TYPHA ANGUSTIFOLIA	35	Y	OBL	
2. PHALARIS ARUNDINACEA	25	Y	FACW	
3. ACER NEGUNDO	5	N	FACW	
4. RUMEX CRISPUS	15	N	FAC	
5. SALIX EXIGUA	5	N	OBL	
6. CIRSIUM ARVENSE	2	N	FACU	
7. POLYGONUM PENSYLVANICUM	10	N	FACW	
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	97 = Total Cover			
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
	_____ = 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B6
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): HILLSLOPE (DITCH SIDE) Local relief (concave, convex, none): NONE
 Slope (%): 20 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: MANAWA SILTY CLAY LOAM (MnA) (AQUOLIC HAPLUDALF) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	---

Remarks: (Explain alternative procedures here or in a separate report.)
***AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER.**
***DITCH SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.**

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B6

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	_____ = Total Cover			
Herb Stratum (Plot size: <u>5'</u>)				
1.	PHALARIS ARUNDINACEA	20	Y	FACW
2.	CIRSIUM ARVENSE	5	N	FACU
3.	RUMEX CRISPUS	10	N	FAC
4.	POA PRATENSIS	35	Y	FAC
5.	SOLIDAGO ALTISSIMA	5	N	FACU
6.	ASCLEPIAS SYRIACA	5	N	NI
7.	CAREX species	5	N	FACW*
8.	ERYNGIUM YUDDIFOLIUM	5	N	FAC
9.	HELIANTHUS TUBEROSUS	5	N	FACW
10.				
11.				
12.				
	95 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
	_____ = 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No

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

***NO SPIKELETS OBSERVED. ASSUMED FACW OR WETTER.**

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B7
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): DRAINAGE SWALE Local relief (concave, convex, none): CONCAVE
 Slope (%): 1 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (KnB) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
--	---

Remarks: (Explain alternative procedures here or in a separate report.)
***AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER.**
***POSSIBLE MIXED SOILS OR HISTORIC FILL.**

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>4</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	---

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B7

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	_____ = Total Cover			
Herb Stratum (Plot size: <u>5'</u> _____)				
1.	JUNCUS TENUIS	15	N	FAC
2.	PHALARIS ARUNDINACEA	20	Y	FACW
3.	SOLIDAGO GIGANTEA	10	N	FACW
4.	RUMEX CRISPUS	15	N	FAC
5.	POA PRATENSIS	15	N	FAC
6.	ERYGIUM YUCCIFOLIUM	20	Y	FAC
7.				
8.				
9.				
10.				
11.				
12.				
	95 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B8
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): DRAINAGE SWALE (UPPER EDGE) Local relief (concave, convex, none): CONCAVE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (KnB) [TYPIC HAPLUDALF] NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)
 *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER.
 *POSSIBLE MIXED SOILS OR HISTORIC FILL.
 *AREA IS HISTORICALLY MOWED.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B8

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum (Plot size: <u>5'</u>)				
1. RUMEX CRISPUS	15	N	FAC	
2. TARAXACUM OFFICINALE	15	N	FACU	
3. POA PRATENSIS	60	Y	FAC	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
1. _____				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B9
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): DRAINAGE SWALE (UPPER EDGE) Local relief (concave, convex, none): CONCAVE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (KnB) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: B9

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
Herb Stratum (Plot size: <u>5'</u> _____)				
1. RUMEX CRISPUS	5	N	FAC	
2. TARAXACUM OFFICINALE	5	N	FACU	
3. POA PRATENSIS	40	Y	FAC	
4. SOLIDAGO ALTISSIMA	25	Y	FACU	
5. ERYNGIUM YUCCIFOLIUM	25	Y	FACU	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	100 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
	_____ = 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes _____ No ✓

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B10
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): FLAT SLOPE Local relief (concave, convex, none): NONE
 Slope (%): 1 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (Knb) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *AREA IS HISTORICALLY MOWED.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____ _____	
Remarks: _____ _____	

VEGETATION – Use scientific names of plants.

	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	
Tree Stratum (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
				_____ = Total Cover
Sapling/Shrub Stratum (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
				_____ = Total Cover
Herb Stratum (Plot size: <u>5'</u> _____)				
1.	<u>POA PRATENSIS</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>
2.	<u>TRIFOLIUM PRATENSE</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
3.	_____	_____	_____	
4.	_____	_____	_____	
5.	_____	_____	_____	
6.	_____	_____	_____	
7.	_____	_____	_____	
8.	_____	_____	_____	
9.	_____	_____	_____	
10.	_____	_____	_____	
11.	_____	_____	_____	
12.	_____	_____	_____	
				<u>85</u> = Total Cover
Woody Vine Stratum (Plot size: _____)				
1.	_____	_____	_____	
2.	_____	_____	_____	
3.	_____	_____	_____	
4.	_____	_____	_____	
				_____ = Total Cover
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

<u>Total % Cover of:</u>	<u>Multiply by:</u>
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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No _____

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B11
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): CONCAVE DEPRESSION Local relief (concave, convex, none): CONCAVE
 Slope (%): 0 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (KnB) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	---

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

Remarks:
EXPOSED ROOTS

VEGETATION – Use scientific names of plants.

Sampling Point: B11

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. SALIX EXIGUA	100	Y	OBL	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. PHALARIS ARUNDINACEA	10	Y	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
10 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
<p>Remarks: (Include photo numbers here or on a separate sheet.)</p>				

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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:

Rapid Test for Hydrophytic Vegetation

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes No

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B12
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): HILLSLOPE COMPOSED OF FILL Local relief (concave, convex, none): NONE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: KEWAUNEE SILT LOAM (KtB) [TYPIC HAPLUDALF] NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *PLOT CONTAINS HISTORICAL FILL	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B12

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. SALIX EXIGUA	5	Y		OBL
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	5 = Total Cover			
Herb Stratum (Plot size: <u>5'</u>)				
1. PHALARIS ARUNDINACEA	20	Y		FACW
2. BROMUS INERMIS	60	Y		NI
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	80 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:	
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (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:	
<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation	
<input checked="" type="checkbox"/> Dominance Test is >50%	
<input type="checkbox"/> Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Definitions of Vegetation Strata:	
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
Woody vines – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B13
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): FLAT AREA Local relief (concave, convex, none): NONE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: OMRO CLAY LOAM (OmB) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): **	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	---

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

Remarks:
****NOT SATURATED BUT VERY MOIST**
MULTIPLE STEMS
EXPOSED ROOTS
REDOX TO 0" BELOW GRADE SUGGESTS HYDROLOGY AT <12" BELOW GRADE
SEASONALLY OR HISTORICALLY.

VEGETATION – Use scientific names of plants.

Sampling Point: B13

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: _____)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. RHAMNUS CATHARTICA	75	Y	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
75 = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1 CAREX species	85	Y	FACW*	
2 SOLIDAGO GIGANTEA	5	N	FACW	
3 RHAMNUS CATHARTICA	5	N	FAC	
4 SOLIDAGO ALTISSIMA	5	N	FACU	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
100 = Total Cover				
Woody Vine Stratum (Plot size: _____)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
1. _____				
2. _____				
3. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) *NO SPIKELETS, ASSUMED FACW OR WETTER.				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
4. _____				

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: ARMORY AREA DETENTION BASIN City/County: OSHKOSH, WINNEBAGO Sampling Date: 10/23/11
 Applicant/Owner: SEE REPORT DISCUSSION State: WI Sampling Point: B14
 Investigator(s): BRIAN D. BATES, P.S.S. & TOM NEITZEL, P.S.S. Section, Township, Range: SECTION 20, T18N, R16E
 Landform (hillslope, terrace, etc.): FLAT AREA Local relief (concave, convex, none): NONE
 Slope (%): 2 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: OMRO CLAY LOAM (OmB) [TYPIC HAPLUDALF] NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) *AVERAGE PRECIPITATION WAS NEAR NORMAL FOR AUGUST AND ABOVE NORMAL FOR SEPTEMBER AND OCTOBER. *SOILS ARE HISTORICALLY DISTURBED OR CONTAIN HISTORIC FILL.	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION – Use scientific names of plants.

Sampling Point: B14

<u>Tree Stratum</u> (Plot size: _____)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>		
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
_____ = Total Cover				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 = _____	
<u>Sapling/Shrub Stratum</u> (Plot size: _____)					Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
<u>Herb Stratum</u> (Plot size: <u>5'</u> _____)					Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
1. BROMUS INERMIS	20	Y	NI		
2. POA PRATENSIS	40	Y	FAC		
3. FESTUCA ARUNDINACEA	10	N	FACU		
4. VICIA SATIVA	30	Y	FACU		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
_____ = Total Cover					
<u>Woody Vine Stratum</u> (Plot size: _____)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

APPENDIX B

Site Photographs



View Facing Northeast Near Center of Property



View Facing Northeast Near Center of Property



View Facing Northwest Near Center of Property



View Facing Southwest Near Center of Property



View of Wetland Ditch Facing Northeast Toward B4, B5 & B6



View of Wetland Ditch Facing Northeast Toward B1, B2 & B3



View of Wetland Ditch Facing South Toward B7, B8 & B9



View of Wetland Facing West Toward B11



View of Wetland (South of B10) Facing Southwest



View of Wetland (South of B10) Facing West



View of Wetland & B13, Facing Southeast

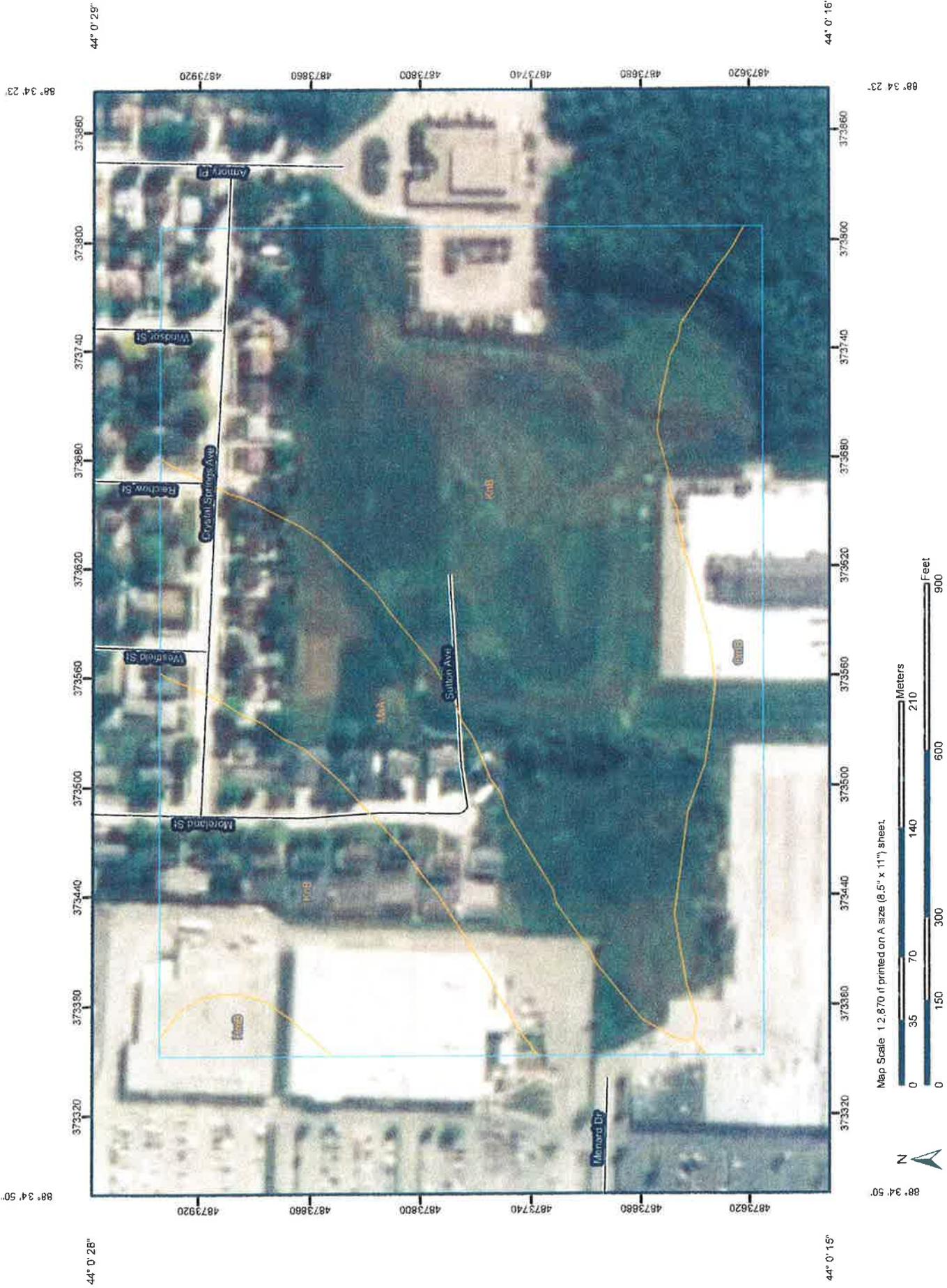


View of Wetland (North of B10) Facing West

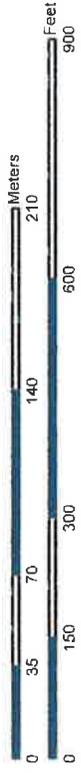
APPENDIX C

Soil Survey Excerpts

Soil Map—Winnebago County, Wisconsin
(Armory Area Detention Basin - Soils Map)



Map Scale 1:2,870 if printed on A size (8.5" x 11") sheet.



- A1—0 to 3 inches; very dark gray (10YR 3/1) fine sand; weak fine subangular blocky structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.
- A2—3 to 4 inches; dark grayish brown (10YR 4/2) fine sand; weak medium subangular blocky structure; very friable; common fine roots; very strongly acid; abrupt smooth boundary.
- B2—4 to 14 inches; yellowish brown (10YR 5/6) fine sand; very weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.
- B3—14 to 22 inches; yellowish brown (10YR 5/4) fine sand; very weak coarse subangular blocky structure; very friable; few fine roots; strongly acid; gradual wavy boundary.
- C—22 to 60 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine roots; medium acid.

Thickness of the solum ranges from 18 to 30 inches. The solum ranges from medium acid to very strongly acid.

The A1 horizon has value of 2 or 3 and chroma of 1 or 2. It is 1 to 4 inches thick. Some pedons have an Ap horizon. Most pedons in cultivated areas have no A2 horizon. The B horizon has 10YR or 7.5YR hue, value of 4 or 5, and chroma of 4 through 6. The C horizon is medium or slightly acid.

Omro series

The Omro series consists of well drained soils that are slowly or moderately slowly permeable in the upper part and moderately permeable in the lower part. These soils formed in a thin mantle of silty or loamy material and the underlying clayey or loamy glacial till. They are on the crests and sides of broad hills on till plains. Slopes are 2 to 6 percent.

Omro soils have a Bt horizon similar to that of Kewaunee soils. They have a C horizon similar to that of Hochheim soils. The C horizon of Kewaunee soils has more clay and less sand and gravel than the C horizon of Omro soils. Hochheim soils have a thinner solum and less clay and more sand in the Bt horizon.

Typical pedon in an area of Omro clay loam, 2 to 6 percent slopes, 400 feet east and 1,200 feet south of northwest corner sec. 18, T. 17 N., R. 17 E.

- Ap—0 to 8 inches; dark brown (7.5YR 3/2) clay loam; pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure; friable; many fine roots; about 2 percent by volume gravel; neutral; abrupt smooth boundary.
- B21t—8 to 13 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm; many fine roots; common thin clay films on faces of peds; about 5 percent by volume of gravel; common

dark brown (7.5YR 3/2) worm casts; neutral; clear wavy boundary.

- B22t—13 to 20 inches; reddish brown (5YR 4/3) clay; strong very fine angular blocky structure; firm; common fine roots; many thin clay films on faces of peds; about 8 percent by volume of gravel; few dark brown (7.5YR 3/2) worm casts; neutral; clear wavy boundary.
- B23t—20 to 28 inches; reddish brown (5YR 4/3) silty clay; moderate fine prismatic structure parting to strong fine angular blocky; firm; common fine roots; many thin clay films on faces of peds; about 8 percent by volume of gravel; about 5 percent by volume of cobblestones; neutral; gradual wavy boundary.
- B3—28 to 36 inches; reddish brown (5YR 4/3) silty clay; moderate medium prismatic structure; firm; few fine roots; about 8 percent by volume of gravel; about 5 percent by volume of cobblestones; common fine pink (5YR 7/4) lime segregations; slight effervescence; mildly alkaline; abrupt wavy boundary.
- IIC—36 to 60 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles in upper part; massive; very friable; about 25 percent by volume of gravel; about 10 percent by volume of stones; strong effervescence; moderately alkaline.

Thickness of the solum and depth to the coarser textured underlying till range from 24 to 40 inches. Thickness of the upper silty mantle is less than 18 inches. Reaction in the solum ranges from medium acid to neutral in the upper part and from slightly acid to mildly alkaline in the lower part. Free carbonates are just below the solum or in the B3 horizon. The solum is 2 to 10 percent by volume dolomite gravel.

The Ap horizon has 10YR or 7.5YR hue, value of 3 or 4, and chroma of 2 or 3. The B horizon commonly is clay or silty clay. Some pedons have subhorizons of silty clay loam or clay loam. The IIC horizon is 15 to 50 percent by volume dolomite gravel. It has a calcium carbonate equivalent between 40 and 60 percent and is mildly or moderately alkaline.

Ossian series

The Ossian series consists of poorly drained, moderately permeable soils formed in thick deposits of silty material. These soils are in depressional areas and upland drainageways. Slopes are 0 to 2 percent.

Ossian soils formed in the same kind of material as the nearby Atterberry soils. They are near Keowns and Lamartine soils. Atterberry soils are somewhat poorly drained. Keowns soils, in similar landscape positions, have carbonates at a depth of 12 to 24 inches. They are coarse-loamy. The somewhat poorly drained Lamartine soils are on adjacent terraces where the silty material overlies glacial till at depths of 20 to 36 inches.

thin A12 horizon. Some pedons have a dark gray (10YR 4/1) A3 horizon less than 4 inches thick. The B2g horizon has 5Y or 2.5Y hue and value of 5 or 6. It is silt loam, loam, very fine sandy loam, loamy very fine sand, or very fine sand. The C horizon is mildly or moderately alkaline. It contains strata of silt, very fine sand, or fine sand.

Kewaunee series

The Kewaunee series consists of well drained and moderately well drained soils that are moderately slowly or slowly permeable. These soils formed in a thin mantle of silty or sandy material and in the underlying loamy or clayey glacial till (fig. 7). These soils are on ground, end, and recessional moraines. Slopes are 2 to 12 percent.

Kewaunee soils are near Hortonville, Manawa, and Omro soils. They are similar to those soils and Winneconne soils. Hortonville and Omro soils are in similar landscape positions. Hortonville soils formed in similar material but are fine-loamy. Omro soils have a similar Bt horizon, but contain more sand and gravel and less clay in the C horizon within depths of 24 to 40 inches. Manawa soils formed in similar material but have mottles with chroma of 2 or less within the upper 10 inches of the argillic horizon. Winneconne soils have more clay in the solum and formed in lacustrine sediment.

Typical pedon in an area of Kewaunee silt loam, 2 to 6 percent slopes, 2,540 feet north and 200 feet east of southwest corner sec. 36, T. 19 N., R. 14 E.

- Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine roots; high content of very fine sand; neutral; abrupt smooth boundary.
- A2—8 to 10 inches; brown (10YR 5/3) silt loam; weak thin platy structure; very friable; common fine roots; high content of very fine sand; slightly acid; abrupt wavy boundary.
- B1t—10 to 13 inches; dark brown (7.5YR 4/4) silty clay loam; moderate fine and very fine subangular blocky structure; friable; common fine roots; few thin clay films on faces of peds; slightly acid; clear wavy boundary.
- 11B21t—13 to 18 inches; reddish brown (5YR 4/3) clay; strong fine and very fine angular blocky structure; firm; common fine roots; many thin clay films on faces of peds; few black (5YR 2/1) stains on faces of peds; slightly acid; clear wavy boundary.
- 11B22t—18 to 24 inches; reddish brown (5YR 4/3) clay; moderate fine prismatic structure parting to strong fine angular blocky; firm; common fine roots; many thin clay films on faces of peds; about 5 percent by volume of gravel; few black (5YR 2/1) stains on faces of peds; slightly acid; clear wavy boundary.
- 11B3t—24 to 29 inches; reddish brown (5YR 4/4) clay; strong medium prismatic structure parting to moder-

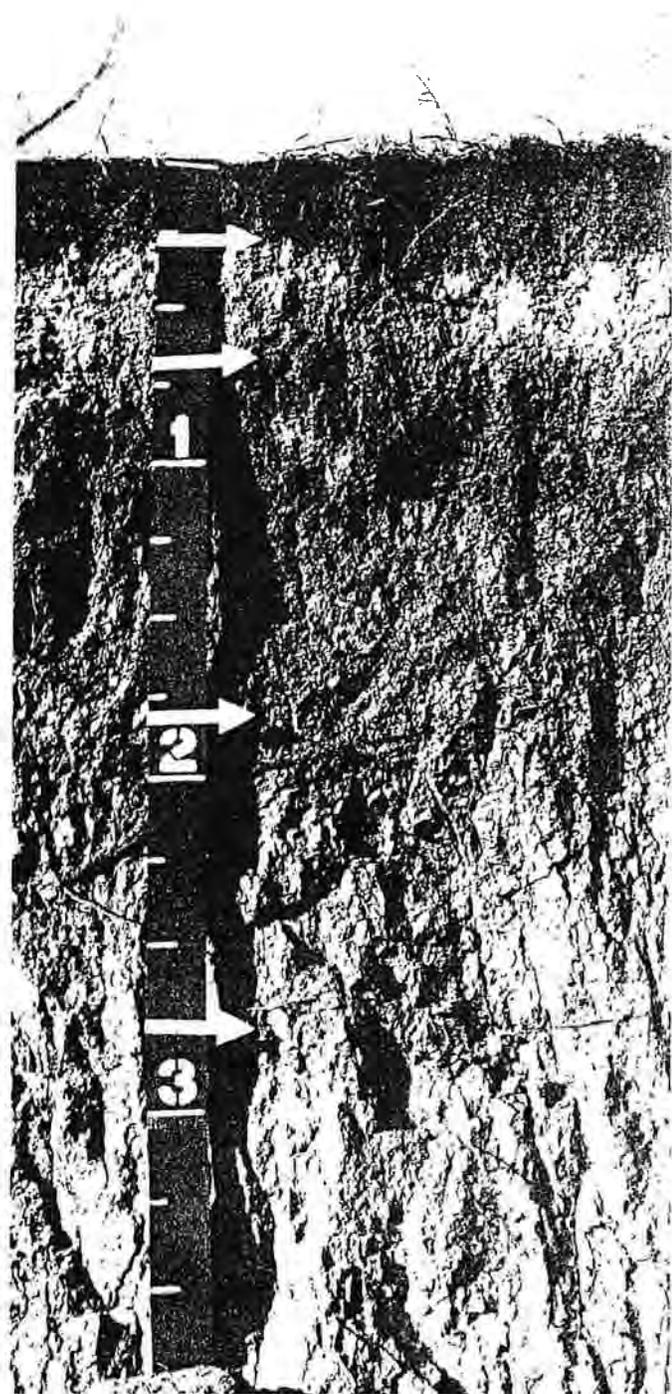


Figure 7.—Profile of Kewaunee silt loam showing prismatic structure in lower part of subsoil. The scale is in feet

ate medium angular blocky; firm; few fine roots; common thin clay films on faces of prisms; about 8 percent by volume of dolomite gravel; slight effervescence; mildly alkaline; clear wavy boundary

stones; slight effervescence; mildly alkaline; abrupt wavy boundary.

- IIC1—19 to 32 inches; brown (7.5YR 5/4) very gravelly loamy sand; common medium distinct strong brown (7.5YR 5/6) mottles; single grained; loose; few fine roots; about 63 percent by volume of gravel; about 15 percent by volume of cobblestones; strong effervescence; mildly alkaline; abrupt wavy boundary.
- IIIC2—32 to 60 inches; reddish brown (5YR 5/3) clay loam; common fine prominent gray (5Y 6/1) and yellowish red (5YR 5/6) mottles; massive; firm; about 17 percent by volume of gravel; few cobblestones; common pink (5YR 7/3) lime segregations; strong effervescence; mildly alkaline.

Thickness of the solum ranges from 12 to 27 inches. Depth to the IIIC horizon ranges from 24 to 40 inches. The Bt horizon has no mottles with chroma of 2 or less. Free carbonates are in the B3 horizon or just below the solum. The IIC horizon is seasonally saturated.

The Ap horizon has value of 2 or 3. It is slightly acid to mildly alkaline.

The B2t horizon has 10YR, 7.5YR, or 5YR hue and value and chroma of 3 or 4. It is loam, clay loam, or sandy clay loam that is as much as 20 percent by volume gravel. It is slightly acid to mildly alkaline. The B3t horizon has 10YR or 7.5YR hue, value of 4 or 5, and chroma of 3 or 4. It is gravelly or very gravelly sandy loam or loamy sand that is about 20 to 60 percent by volume gravel and as much as 10 percent by volume cobblestones. It ranges from neutral to moderately alkaline.

The IIC1 horizon has 10YR or 7.5YR hue, value of 4 through 6, and chroma of 2 through 4. It is very gravelly loamy sand or sand that is about 55 to 75 percent by volume gravel and as much as 15 percent by volume cobblestones. It is mildly or moderately alkaline. The IIIC2 horizon is clay loam, silty clay loam, silty clay, or clay that is as much as 20 percent by volume gravel. It is mildly or moderately alkaline.

Manawa series

The Manawa series consists of somewhat poorly drained, slowly permeable soils formed in clayey or loamy glacial till. These soils are on valley terraces and in upland drainageways. Slopes are 0 to 3 percent.

Manawa soils formed in the same kind of material as the nearby Kewaunee and Poygan soils. Kewaunee soils, in higher landscape positions, do not have mottles with chroma of 2 or less. The poorly drained Poygan soils are in depressional areas.

Typical pedon in an area of Manawa silty clay loam, 0 to 3 percent slopes, 805 feet south and 160 feet east of northwest corner SW1/4 sec. 12, T. 17 N., R. 16 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangu-

lar blocky structure; friable; many fine roots; neutral; abrupt smooth boundary.

- B21t—9 to 15 inches; reddish brown (5YR 4/4) silty clay loam; many medium distinct brown (7.5YR 5/2) and common fine faint dark brown (7.5YR 4/4) mottles; strong fine angular and subangular blocky structure; firm; many fine roots; many thin clay films on faces of peds; about 3 percent by volume of gravel; neutral; clear wavy boundary.
- B22t—15 to 26 inches; reddish brown (5YR 4/3) silty clay; many medium distinct grayish brown (10YR 5/2) and many medium prominent strong brown (7.5YR 5/6) mottles; moderate fine prismatic structure parting to strong fine subangular blocky; firm; many fine roots; common thin clay films on faces of peds; about 8 percent by volume of gravel; neutral; clear wavy boundary.
- B3—26 to 35 inches; reddish brown (5YR 4/3) silty clay; many medium prominent gray (5YR 5/1) mottles; moderate medium prismatic structure; firm; few fine roots; about 5 percent by volume of gravel; many pink (5YR 7/3) lime segregations; faces of prisms almost totally gleyed; strong effervescence; mildly alkaline; gradual wavy boundary.
- C—35 to 60 inches; reddish brown (5YR 4/3) silty clay; common medium prominent gray (5YR 5/1) mottles; massive; firm; about 5 percent by volume of gravel; few pink (5YR 7/3) lime segregations; strong effervescence; moderately alkaline.

Thickness of the solum ranges from 26 to 40 inches. Some pedons have an upper mantle of silty material less than 20 inches thick. The solum commonly ranges from slightly acid to mildly alkaline but is moderately alkaline in the lower part of some pedons. Free carbonates are just below the solum or in the B3 horizon. The solum is as much as 10 percent by volume gravel.

The Ap horizon has 10YR or 7.5YR hue, value of 2 or 3, and chroma of 1 or 2. It is 6 to 9 inches thick. Some pedons have an A1 and A2 horizon. The B horizon has value of 4 or 5 and chroma of 3 or 4. It commonly is silty clay loam, silty clay, or clay, but subhorizons of clay loam are in some pedons. The C horizon is clay, silty clay, clay loam, or silty clay loam. It is mildly or moderately alkaline. It is as much as 10 percent by volume gravel.

McHenry series

The McHenry series consists of well drained, moderately permeable soils formed in silty material and the underlying loamy glacial till. These soils are on valley sides and on low hills and morainic ridges of till plains. Slopes are 2 to 12 percent.

McHenry soils formed in the same kind of material as the nearby Kidder, St. Charles, and Whalan soils. Kidder soils, in similar landscape positions, contain more sand in the upper part of the solum. St. Charles soils com-

APPENDIX D

Hydric Soil List

HYDRIC SOIL INTERPRETATIONS - QUICK REFERENCE HYDRIC LIST
 WINNEBAGO COUNTY, WISCONSIN - Technical Guide - Section II

whole map unit: all of the named components of the map unit are hydric.
 part of map unit: 1 or more named components are hydric and 1 or more named components are not hydric.
 inclusions: none of the named components are hydric, but the map unit commonly contains hydric inclusions.
 Map units not included on this list have no hydric components, and do not commonly contain hydric inclusions.

THIS IS NOT THE OFFICIAL HYDRIC LIST. Refer to the official hydric list and notes for more information.

Symbol	Map Unit Name	Hydric Part
Ak	ADRIAN MUCK-----	whole map unit
AtA	ATTERBERRY SILT LOAM, 0 TO 3 %-----	inclusions
Ed	EDWARDS MUCK-----	whole map unit
FkA	FISK LOAMY FINE SAND, 0 TO 3 %-----	inclusions
Fn	FLUVAQUENTS-----	whole map unit
HoB	HORTONVILLE LOAMY FINE SAND, 2 TO 6 %-----	inclusions
HrB	HORTONVILLE SILT LOAM, 2 TO 6 %-----	inclusions
Hu	HOUGHTON MUCK-----	whole map unit
Hw	HOUGHTON MUCK, PONDED-----	whole map unit
KaB	KAUKAUNA SILTY CLAY LOAM, 1 TO 4 %-----	inclusions
Ke	KEOWNS SILT LOAM-----	whole map unit
KnB	KEWAUNEE SILT LOAM, 2 TO 6 %-----	inclusions
Ks	KINGSVILLE MUCKY LOAMY FINE SAND-----	whole map unit
KyA	KOROBAGO SILT LOAM, 0 TO 3 %-----	inclusions
LmA	LAMARTINE SILT LOAM, 0 TO 3 %-----	inclusions
LzB	LORENZO VARIANT LOAM, 2 TO 8 %-----	inclusions
MaA	MANAWA SILTY CLAY LOAM, 0 TO 3 %-----	inclusions
Mn	MENASHA CLAY-----	whole map unit
MoA	MOROCCO LOAMY FINE SAND, 0 TO 3 %-----	inclusions
MtA	MOSEL SILT LOAM, 0 TO 3 %-----	inclusions
Na	NAVAN SILT LOAM-----	whole map unit
NeA	NEBAGO FINE SAND, 0 TO 3 %-----	inclusions
Ng	NEBAGO VARIANT MUCKY LOAMY FINE SAND-----	whole map unit
NhA	NEENAH SILTY CLAY LOAM, 0 TO 3 %-----	inclusions
NnA	NENNO LOAM, 0 TO 3 %-----	inclusions
OmB	OMRO CLAY LOAM, 2 TO 6 %-----	inclusions
Os	OSSIAN SILT LOAM-----	whole map unit
Pa	PALMS MUCK-----	whole map unit
Pt	POY SILTY CLAY LOAM-----	whole map unit
Pu	POYGAN SILTY CLAY LOAM-----	whole map unit
We	WAUSEON SILT LOAM-----	whole map unit
Wm	WILLETTE MUCK-----	whole map unit
WnB	WINNECONNE SILTY CLAY LOAM, 1 TO 4 %-----	inclusions
YaA	YAHARA SILT LOAM, 0 TO 3 %-----	inclusions
ZtA	ZITTAU SILTY CLAY LOAM, 0 TO 3 %-----	inclusions

Appendix E

Hazardous Materials



AECOM
558 North Main Street
Oshkosh, WI 54901

920.235.0270 tel
920.235.0321 fax

April 26, 2011

Mr. Steven M. Gohde, P.E.
Assistant Director of Public Works
City of Oshkosh
215 Church Avenue
Oshkosh, Wisconsin 54903-1130

Subject: Environmental Review of Historical Records for the Proposed Armory Detention Basin, Oshkosh, Wisconsin, AECOM Project No 60191534

Dear Mr. Gohde,

AECOM Technical Services, Inc. (AECOM) was contracted to evaluate current and past property uses within and around the proposed Armory Detention Basin project that may have potential environmental impacts to the proposed project. The proposed Armory Detention Basin is located to the west of the Wisconsin Army National Guard - Oshkosh and to the south of the residential homes located on Crystal Springs Avenue. The associated storm sewer upgrades will be located to the west of the Wisconsin Army National Guard – Oshkosh and on Menard Drive from South Koeller Street to the proposed basin. AECOM is providing this environmental historical records review, which included a general environmental site reconnaissance, for the Armory detention basin.

The environmental historical review utilized several information sources:

- Existing AECOM reports and information
- Historic Sanborn® Fire Insurance maps of the area
- Available environmental database information
- Historical Aerial Photographs of the area
- Wisconsin Department of Natural Resources (WDNR) and Department of Commerce (WDCOM) file information
- City of Oshkosh Sanitation Department report regarding historic landfills
- Site reconnaissance information that includes site photographs and field observations from public right-of-ways.

Results of the review indicated that the Wisconsin Army National Guard-Oshkosh, located at 1415 Armory Place and 1550 Osborn Avenue, was identified on the underground storage tank (UST), RCRA-Conditionally Exempt Small Quantity Generator (CESQG), Tier 2 and MANIFEST regulatory database lists. The UST database indicated this site had a 10,000-gallon fuel oil tank that was closed and removed in 1991. The RCRA-CESQG status was listed as 2004, with no violations noted, and the Manifest listing was for the disposal of lead hazardous waste in 2008 and 2009. The

Tier 2 listing included reporting for storage of diesel fuel in a UST on site in 2008 and JP8-universal fuel in a UST on site in 2009. These sites adjoin the subject property to the east and south. Based on inferred groundwater flow (site is down gradient from the subject property) and based on the closed/removed status with no listing for the site under the investigation or cleanup programs (indication of contamination); it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Koeller Center, 1126 South Koeller Street, is located west to northwest of the subject property and was identified on the WI Emergency Repair Program (ERP) regulatory database list. According to the listing, this is an active site with ongoing investigations relating to chlorinated solvent contaminated groundwater and soil. The site is located less than one-quarter mile topographically up gradient from the project area and therefore, there is a slight potential for groundwater impacts to be encountered within the proposed construction limits.

Pennzoil 10 minute Oil Change, 1124 South Koeller Street, is also located less than one-quarter mile north and northwest of the project site, and was identified on the aboveground storage tank (AST) and RCRA-Non-generator (NonGen) regulatory database list as having a waste/used motor oil tank that was closed and removed in 2004. Based on its distance, it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Lang Oil Inc., 1759 West 9th Avenue, is located north to northwest of the project site, and was identified on the leaking underground storage tank (LUST) and activity use limitation (AUL) regulatory database lists. This site was closed with petroleum contaminated soil and groundwater remaining on site. According to the GIS closure information available from the online database, groundwater flow at this site is to the southeast. Based on the site's status and distance from the subject property (over 0.25 miles), it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Napa Auto Parts, 1405 South Washburn Street, is located to the west of the subject property, and was identified on the leaking underground storage tank (LUST) regulatory database list. This site was closed with petroleum contaminated soil and groundwater remaining on site. Based on the site's status and distance from the subject property (over 0.25 miles and across Highway 41), it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Sheas Muffler Shop., 1781 West 9th Avenue, is located north to northwest of the subject property, and was identified on the leaking underground storage tank (LUST) and activity use limitation (AUL) regulatory database lists. This site was closed with petroleum contaminated soil and groundwater remaining on site. According to the GIS closure information available from the online database, groundwater flow at this site is to the southeast. Based on the site's status and distance from the subject property (over 0.25 miles), it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Oshkosh Quarries, Knapp Street, is located south and southeast of the subject property, and is identified on the state hazardous waste sites (SHWS) regulatory database list. Based on inferred groundwater flow (site is side and down gradient from the subject property), it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Sew Cleaners, 2100 West 9th Avenue, is located northwest of the subject property. This site was also erroneously listed at 1142 South Koeller Street in the EDR report but is actually located on West 9th Avenue. This site is located on the activity use limitation (AUL), WI Emergency Repair Program (ERP), and RCRA-Non-generator (NonGen) regulatory databases. Based on the site's

distance from the subject property (approximately 0.5 miles), it is unlikely that impacts will be encountered within the proposed construction limits from this site.

Attached are the documents AECOM used to identify the areas of potential contamination along with a photograph log of the current property uses. AECOM observed a drainage pond located in the northeast corner of the subject property. It appears water drains from the adjacent Wisconsin Army National Guard - Oshkosh parking lot into this pond. However, AECOM did not observe any sheen or any other signs of contamination in or near the pond and the associated drainage ditch.

Based on the results of this review, AECOM identified the Koeller Center (northwest of the subject property) as having a slight potential to impact groundwater in the project area. AECOM recommends a review of the WDNR file to determine the extent of the contamination at the Koeller Center Site to further evaluate the potential for impacts to the project area. In addition, it is recommended that AECOM be notified in the event any odor or discoloration of soil and/or groundwater is encountered during construction.

If you have any questions or comments, please contact us at 920-235-0270.

Sincerely yours,



Craig C. LeNoble
Assistant Project Manager
craig.lenoble@aecom.com



Michelle L. Freimund, P.G.
Project Manager
michelle.freimund@aecom.com



Albert W. Cole, Section Chief
Senior Program Manager
albert.cole@aecom.com

cc: Jim Bachhuber, Project Manager – AECOM Technical Services, Inc.
Mike Wegner, Assistant Project Manager – AECOM Technical Services, Inc.

Attachments

- Photograph Log
- EDR Historical Aerials
- EDR Sanborn® Maps
- EDR Radius Map Report



AECOM
558 North Main Street
Oshkosh, WI 54901

920.235.0270 tel
920.235.0321 fax

July 6, 2011

Mr. Steven M. Gohde, P.E.
Assistant Director of Public Works
City of Oshkosh
215 Church Avenue
Oshkosh, Wisconsin 54903-1130

Subject: Addendum to the Environmental Review of Historical Records for the Proposed Armory Detention Basin, Oshkosh, Wisconsin, AECOM Project No 60191534

Dear Steve,

AECOM Technical Services, Inc. (AECOM) was contracted to evaluate current and past property uses within and around the proposed Armory Detention Basin project that may have potential environmental impacts to the proposed project. The proposed Armory Detention Basin (“subject property”) is located to the west of the Wisconsin Army National Guard - Oshkosh property and to the south of the residential homes located on Crystal Springs Avenue. The associated storm sewer upgrades will be located to the west of the Wisconsin Army National Guard – Oshkosh property and on Menard Drive from South Koeller Street to the proposed basin. AECOM completed the evaluation and presented the results in a letter report dated April 26, 2011, *Environmental Review of Historical Records for the Proposed Armory Detention Basin, Oshkosh, Wisconsin*. AECOM identified the Koeller Center (less than one quarter mile northwest of the subject property) as having a slight potential to impact groundwater in the project area and recommended a review of the Wisconsin Department of Natural Resources (WDNR) file to further evaluate the potential for impacts to the project area.

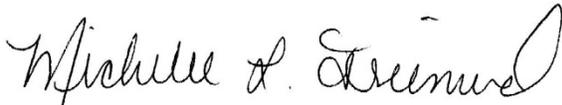
AECOM reviewed the Koeller Center WDNR file at the Oshkosh Service Center on June 10, 2011. A former drycleaner was located in the tenant space on the southeast corner of the building (1142 South Koeller Street). The results of the most recent investigation report (January 2011) indicated chlorinated solvent impacted soil and groundwater are present in an area adjacent to the building, from the southeast corner north to the nearest transformer (approximately 60 feet) on east side of the building. Groundwater was determined to flow to the north, based on groundwater elevations measured in April 2009.

Based on the results of the WDNR file review, it is unlikely that impacts from the chlorinated solvent release at the Koeller Center will be encountered within the proposed construction limits for the proposed Armory Detention Basin, due to the limited area of impacted soil and groundwater and the northern groundwater flow direction (away from the proposed basin). This addendum letter should

be read in conjunction with and incorporated into the April 26, 2011 letter report for the proposed Armory Detention Basin referenced above.

Please call Michelle Freimund at 920-236-6712 with any questions.

Yours sincerely,



Michelle L. Freimund, P.G.
Project Manager



Albert W. Cole
Sr. Program Mgr./Oshkosh Env. Dept. Mgr.

cc: Mr. James Rabe, Civil Engineer – City of Oshkosh Public Works Department
Jim Bachhuber, Project Manager – AECOM Technical Services, Inc.
Mike Wegner, Assistant Project Manager – AECOM Technical Services, Inc.