Year Five
Monitoring and Management Report

Ravenna Training and Logistics Site (RTLS)
Route 80 Tank Farm Wetlands Mitigation Area
Charlestown Township, Portage County, Ohio

November, 2011

DAVEY RESOURCE GROUP

A Division of The Davey Tree Expert Company

Year Five
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Route 80 Tank Farm Wetlands Mitigation Area
Charlestown Township, Portage County, Ohio

November, 2011

Prepared for: **State of Ohio Adjutant General's Department**
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Introduction

Davey Resource Group has been retained by U.S. Property and Fiscal Officer (USPFO) for Ohio to perform monitoring and to prepare a *Year Five Monitoring and Management Report* for the Route 80 Tank Farm wetlands mitigation project within the Ravenna Training and Logistics Site (RTLS) in Charlestown Township, Portage County, Ohio (Appendix A). This mitigation project was constructed to provide future mitigation as needed. Currently, only a portion of this site, 0.915 acre, is being used as mitigation for isolated wetland impacts on RTLS (SWIMS ID # 083389) (Appendix B).

Monitoring of a mitigation site for a period of five years for mitigation projects is generally required by the U.S. Army Corps of Engineers (USACE) and the Ohio Environmental Protection Agency (OEPA). This report provides a description of the site characteristics, including vegetation, soils, and hydrology, in order to evaluate the success for this site five years following construction.

Mitigation Site Description

Preconstruction Habitat

The wetland mitigation area was originally a tank farm associated with the former Ravenna Army Ammunition Plant. The tanks and contaminated soil were removed, leaving an area of clean fill, gravel, and disturbed soils. Two small wetlands were present in the northern and west-central parts of the mitigation site. In addition, three small areas of non-wetland vegetation, which included shrubs and small trees, were also present in the project area.

Description of the Mitigation Wetlands

Construction of the mitigation wetlands was completed in October, 2007. At that time, the study area totaled 4.964 acres. This area was expanded slightly in 2008 to accommodate some of the restored wetlands. The entire project area now totals 5.148 acres. Within this project area, nine wetland cells were created ranging in size from 0.091 acre to 1.061 acres. These cells were created by excavating shallow depressions which are separated by low berms. Three small, deeper depressions were excavated within three of the wetland cells. Two of the existing wetlands (0.082 acre) and three areas of non-wetland vegetation were left undisturbed.

A map depicting as-built conditions for the mitigation site is located in Appendix C. The nine excavated wetland cells total 3.243 acres. This acreage includes the deeper excavated areas, but does not include the berms or the two small wetlands that existed prior to construction.

Following construction on October 22, 2007, the entire mitigation area was seeded with 150 pounds of a wetland seed mix obtained from Ernst Conservation Seeds. The rate of seeding was 30 pounds an acre and the seed mix was sown into the soil using a seed drill. Table 1 contains a list of plants contained within this seed mix.

Table 1. Species Contained in Wetland Seed Mix

Scientific Name	Common Name	Indicator Status
Agrostis perennans	autumn bent grass	FACU
Carex lurida	bottlebrush sedge	OBL
Carex scoparia	pointed broom sedge	FACW
Carex vulpinoidea	fox sedge	OBL
Elymus virginicus	Virginia wild rye	FACW-
Juncus effusus	soft rush	FACW+
Panicum clandestinum L.	deer's-tongue panicgrass	FAC+
Panicum virgatum	switch grass	FAC
Secale cereale	annual rye	UPL
Tripsacum dactyloides	eastern gamma grass	UPL

Review of Mitigation Parameters and Monitoring Methodology

The objective of the annual wetlands monitoring is to report on the progress of wetland restoration at the Route 80 Tank Farm Wetlands Mitigation Area. Cells 7 and 8, totaling 0.915 acre is to be used for isolated wetland impacts associated with construction (Appendix B). The remaining portion of this site was constructed in anticipation of future mitigation needs. The specific parameters outlined in this section will be collected during a five-year monitoring period so that specific goals can be tracked. These parameters are similar to those that have been required by Ohio Environmental Protection Agency (OEPA) and USACE for mitigation projects.

The Ohio Rapid Assessment Method (ORAM) for wetlands is a rapid, semi quantitative, wetland ranking tool. It is designed to categorize a wetland based on whether it is a particular type of wetland (*e.g.,* fen, bog, old growth forest, etc.) or contains threatened or endangered species, or based on its "score". A wetland will obtain a score which will classify it as a low-quality Category 1 wetland, a Category 2 wetland, or a high-quality Category 3 wetland. An ORAM form will be completed and a score assigned to the mitigation wetlands each monitoring year (Mack, 2001).

After construction of the wetland cells, six monitoring quadrats were chosen within different projected depth zones of the new wetlands in different existing and proposed habitat types. A one-square-meter quadrat was centered at each monitoring stake to sample herbaceous vegetation. Live, woody vegetation stems were counted within a 5-meter radius of each monitoring stake to sample the forested, scrub/shrub community. These monitoring quadrats were permanently marked for future monitoring purposes using ultraviolet, light-resistant, polyvinyl chloride stakes. Each monitoring quadrat was also surveyed using a global positioning system (GPS) unit with navigational capability so that these areas can be relocated if the stakes are lost during the five-year monitoring period. The location of these quadrats is shown on the map in Appendix C. Photographs of all monitoring quadrats are included in Appendix D.

Hydrologic Conditions

Hydrology monitoring in May and July/August of each year included quantitative hydrologic measurements of surface water inundation or depth to soil saturation at the center of each monitoring quadrat. Measurements were expressed in inches above or below the soil surface. The depth to saturation in the soil column was determined using a one-inch diameter soil probe. The depth of the groundwater table was noted, when possible, by measuring the depth to standing water in the pit made by the soil probe.

The hydrologic goal is to achieve a mixture of areas which have seasonally to regularly inundated to saturated hydrologic regimes (Environmental Laboratory, 1987). The hydrology definitions refer to hydroperiods greater than 12.5 percent to 25 percent of the growing season for a seasonally inundated or saturated area, and greater than 25 percent to 75 percent of the growing season for a regularly inundated or saturated area. Wetland areas were planned in which a variety of water depths will be present from early spring to summer ranging from saturated soils to soils inundated with up to two feet of water.

Vegetation

Information regarding plant species composition and percent cover within the monitoring quadrats was collected in July/August of each monitoring year. Plant identification resources used include Braun (1967, 1989), Newcomb (1977), and Weishaupt (1971).

The Floristic Quality Assessment Index (FQAI) is a value given to wetlands to assess the nativeness of an area based on the presence of conservative species (Andreas, 1995). The values are based upon how sensitive the plants are and whether or not they are indigenous to the area. A FQAI score was calculated during each monitoring year.

The Vegetation Index of Biotic Integrity (VIBI) is an intensive statistical wetlands monitoring methodology used by OEPA at mitigation sites that measures the ecological condition of wetlands. Monitoring protocols will follow the *Integrated Wetland Assessment Program: Part 9: Field Manual for the Vegetation Index of Biotic Integrity for Wetlands v. 1.4* (Mack, 2007). Using the vegetation and hydrogeomorphic classes of the wetlands in conjunction with the VIBI data, inferences can be made regarding the wetlands' functions and performance level.

One VIBI focus plot was established in the mitigation wetlands. A VIBI score was calculated for the site each monitoring year.

The following invasive species were taken from the Ohio Department of Natural Resources Division of Natural Areas and Preserves top ten invasive species list of 2007. Percent areal vegetative cover of these species, if present, was measured[1:]

Alliaria petiolata	garlic mustard
Elaeagnus umbellate	autumn-olive
Lonicera japonica	Japanese honeysuckle
Lonicera maackii, L. morrowii , L tatarica	bush honeysuckles
Lythrum salicaria	purple loosestrife
Phalaris arundinacea	reed canary grass
Phragmites australis	giant reed
Polygonum cuspidatum	Japanese knotweed
Rhamnus frangula, R. cathartica	buckthorns
Rosa multiflora	multiflora rose

The vegetation goals set were used to evaluate wet meadow and emergent marsh habitats on the site. This area is expected to develop into a wet meadow with small areas of emergent marsh within the deeper excavated areas. A dominance of hydrophytic vegetation is expected within the mitigation wetlands. To extrapolate percent hydrophytic and invasive vegetation cover data over the entire mitigation site, a list of all species was recorded at each monitoring quadrat and assigned a percent areal coverage (Appendix D). This information was confirmed by visual observation of species coverage.

[1] Source: http://www.dnr.state.oh.us/dnap/invasive/invasivebrochure/tabid/2007/Default.aspx

Soils

Routine monitoring data collected in July of each year included the determination of soil characteristics at each monitoring quadrat. Soil samples were taken at a depth of approximately 10 inches using a 1-inch diameter soil probe. Collection methods adhered to those outlined in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987) and soil chromas were determined with a Munsell Color Chart (Munsell Color, 1994).

The wetland areas are expected to contain hydric soils chromas. Any soils that do not contain hydric soil indicators are expected to convert to hydric chromas or demonstrate characteristics of developing hydric indicators by the end of the monitoring period.

Monitoring Data—Year Five (2011) Results

The objective of the *Year Five Monitoring and Management Report* is to document conditions five years after construction activities in order to evaluate the progression and success of wetlands conversion, and to determine if the site has met its performance goals.

This site was visited on May 9 and August 1, 2011 by Todd Crandall. During these site visits, the extent of the mitigation wetlands were mapped and vegetation, soils, and hydrology were assessed at each of the six monitoring quadrats. Photographs of each stake and vegetation, water depth, and soils data collected at each monitoring stake are found in Appendix D.

A wetlands map that depicts the mitigation site with photograph locations and the extent of the mitigation wetlands in Year Five is located in Appendix C. A total of 3.137 acres of wetlands were delineated on May 9, 2011. Soils, hydrology, and vegetation data sheets from the wetland delineation are located in Appendix E. The locations of the wetland delineation sample points are shown on the map in Appendix C. These wetlands were identified within the individual wetland cells and outside the cells, if conditions were appropriate. Some wetlands have merged during the monitoring period and they are labeled on the map as combined cells.

Table 2 summarizes the mitigation project's five-year monitoring parameters and provides a concise look at the fifth year's results.

Table 2. Summary of Results

Monitoring Results	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
Acreage of wetlands created	0[1]	2.556[2]	2.536[2]	2.625[2]	3.137[2]
ORAM v. 5.0 score	25.5 (Category 1)	29.5 (Category 1)	32.5 (1-2 gray zone)	33.5 (1-2 gray zone)	41 (modified 2)
Percent unvegetated open water	-	27%	18%	14%	8%
Total number of plant species	38	91	124	139	146
Total number of FAC, FACW, and OBL wetlands plant species[3]	22	48	67	76	80
FQAI Score	9.07	14.58	17.89	19.62	20.04
Percent areal cover of hydrophytic vegetation[4]	<1%	30%	29%	60%	68%
VIBI-E score	0	23	30	44	43
Percent areal cover invasive species	<1%	<1%	<1%	<1%	7.5%
Total number of wildlife species	6	10	15	18	21

[1] Acreage of wetland cells created was 3.243 acres; however, wetland criteria were not present in Year One.

[2] Mitigation acreage does not include the two existing wetlands, totaling 0.082 acre.

[3] Wetland indicator status definitions are located in Appendix F.

[4] Calculated using percent cover data collected for each of the six monitoring quadrats.

Hydrologic Conditions

Standing water was observed over much of the site in 2011. During the May monitoring, water levels ranged from saturated soils to 14 inches of standing water. In August, standing water was observed at 3 quadrats, saturated soils at 2 quadrats, and no hydrological indicators at the remaining quadrat. Unvegetated open water throughout the site equals 0.248 acre.

Vegetation

Wetlands vegetation has colonized the mitigation area. The following is a description for each plant community type including the size and dominant plant species identified in 2011. These areas are depicted on the vegetation community map located in Appendix G. A vegetation list for all species identified at the Route 80 Tank Farm Wetlands Mitigation Site is located in Appendix H.

Marshes (1.159 Acres). In the marsh areas, *Typha latifolia* (broad-leaved cattail, OBL) is dominant in most of the shallow marsh areas. Other species such as *Juncus acuminatus* (sharp-fruited rush, OBL), *Juncus effusus* (soft rush, FACW+), and *Ludwigia palustris* (water-purslane, OBL) are also dominant in some of these areas. These conditions have changed very little since 2010.

Wet Meadows (1.613 Acres). *Juncus effusus* (soft rush, FACW+) is dominant in many of the wet meadow areas. Other dominant species include *Carex* spp. (sedges) and *Verbena hastata* (blue vervain, FACW+).

Scrub/Shrub Wetlands (0.182 Acre). A small portion of the site is a scrub/shrub wetland. Dominant species in this area include *Rhamnus frangula* (glossy buckthorn, FAC) and *Salix* sp. (willow, WIS).

Upland Old Fields (1.914 Acres). Most of the non-wetland areas on the site are upland old field. Dominant species in these areas include *Ambrosia artemisiifolia* (common ragweed, FACU), *Festuca* sp. (fescue, UIS), *Melilotus* spp. (sweet clovers, UIS), and *Trifolium* spp. (clovers, UIS). Although the areas of upland old field have decreased as the wetlands have expanded, the dominant species in these areas have remained relatively constant.

Shrub Thickets (0.032 Acre). The two, small shrub thickets within the site contain *Rhamnus frangula* (glossy buckthorn, FAC) and *Salix* sp. (willow, WIS).

The wetlands continue to expand as the site recovers from construction. The area of open water is decreasing as emergent plants begin to colonize these areas. The site will eventually become vegetated with no open water, but this process will take time and will not occur within the five-year monitoring period.

The percent areal cover of hydrophytic vegetation continues to increase and is currently at 68 percent.

The FQAI score was calculated for the mitigation wetlands. The mitigation area currently has a FQAI score of 20.04, a slight increase from last year's value of 19.62. This value is expected to continue to increase over time as the site continues to be colonized by new plant species, many of which are less disturbance tolerant and have higher Coefficient of Conservatism values.

An ORAM v. 5.0 form was completed for the mitigation wetland. The wetlands mitigation system scored 41, which places it within the modified Category 2 range. This is an increase of 7.5 points from the 2009 score of 33.5. The ORAM form for Year Five (2011) is included in Appendix I. As vegetation continues to colonize the site and hydrology comes to equilibrium following construction disturbance, the ORAM score will continue to increase over time.

VIBI

One VIBI focus plot was established in the mitigation site. The location of this plot is shown on the map in Appendix C. The location of the plot was chosen so as to be representative of the mitigation wetlands. The data for the VIBI survey were collected on August 1, 2011. This data, including each calculation step, can be found in Appendix J.

The VIBI-E score for emergent wetlands was calculated as 43, a decrease of 1 point from the 2010 score of 44 and within modified Category 2 range. The VIBI score is expected to further increase as the mitigation wetlands recover from construction disturbance and vegetation coverage and diversity continue to increase.

Wildlife

Four amphibian, 14 bird, and 3 mammal species were observed utilizing the mitigation site (Appendix K). The wetlands mitigation project is adjacent to a woodlot; therefore, it is highly likely that many other species inhabit or at least utilize this site. The species list is merely a snapshot in time and contains only wildlife and signs observed during this one-day visit. It should be noted that the identification of all species taking advantage of this project area would require much more intensive study, such as netting or trapping surveys.

Maintenance Concerns and Discussion

The successional process on the site continues, with more areas becoming vegetated and perennial species replacing annual species. The area of open water continues to decrease and is expected to eventually be covered with vegetation. The yearly increases in wetland acreage, plant species diversity, Coefficient of Conservatism values, ORAM, and VIBI scores demonstrate that the ecological quality of the wetlands is increasing over time.

The areal cover of invasive species has shown an increase from 2010. *Phragmites australis* (giant reed, FACW) is found in a few areas of the mitigation site and has significantly spread since 2010. Some of the cattails which are developing colonies within the areas of deeper water are *Typha angustifolia* (narrow-leaved cattail, OBL), which is another invasive species. This situation should be monitored in 2012, and control of invasive species colonies is recommended to prevent their further spread.

Portions of the site, including parts of the VIBI focus plot, are dominated by cattails, primarily *Typha latifolia* (broad-leaved cattail, OBL). The cattails are beginning to form monocultures which are excluding other native and desirable hydrophytes and are likely responsible for the slight decrease in the VIBI score this year. Elimination of some of the cattail monocultures combined with planting and/or seeding of other native hydrophytes should be considered.

Summary

Davey Resource Group has been retained by USPFO for Ohio to perform monitoring and to prepare a *Year Five Monitoring and Management Report* for the wetlands mitigation project within the Ravenna Training and Logistics Site at the Route 80 Tank Farm Wetlands Mitigation Site in Charlestown Township, Portage County, Ohio. A portion of this site, 0.915 acre is to be used as mitigation for isolated wetland impacts associated with construction on RTLS. The remaining acreage is to be used for future mitigation.

The site was visited on May 9 and August 1, 2011 to collect data for the *Year Five Monitoring and Management Report*.

A total of 146 plant species were found on the site this year, of which 80 are wetlands species. The FQAI score of 20.04 has shown yearly increases over the five year monitoring period. Four amphibian, 14 bird, and 3 mammal species were observed utilizing the mitigation site.

Using the ORAM form, the wetlands mitigation system scored a 41 which falls within the modified Category 2 range. The VIBI-E score for emergent wetlands is 43, which is a decrease of 1 point from the 2010 score, and also is within the modified Category 2 range.

Percent areal cover of hydrophytic vegetation is 68 percent, which is an increase of 8 percent from 2010. Marsh and wet meadow plant communities have formed within the mitigation area. Open water continues to decrease and now comprises 8 percent of the total area of restored wetland.

The cover of invasive species, including *Phragmites australis* (common reed, FACW) and *Typha angustifolia* (narrow-leaved cattail, OBL), has increased to 7.5 percent this year. Future control of invasive species is recommended.

The mitigation wetlands have shown yearly increases over the five-year monitoring period for most of the parameters that were measured. The wetland will continue to increase in diversity and vegetation cover over time. A total of 3.137 acres of Category 2 wetlands have been created. The acreage and category meet the goals for the isolated wetlands mitigation. This report for Year Five concludes our monitoring of the site.

References and Professional Staff

Appendix L contains a list of references consulted while conducting this study and Appendix M lists Davey Resource Group professionals involved.

Appendix A
Location of Study Area on Highway Map

N
W E
S

0.5 0.25 0 0.5 1
Miles

Site Location: Ravenna Training and Logistics Site (RTLS)
Route 80 Tank Farm
Wetlands Mitigation Area
Charlestown Township, Portage County, Ohio

Source: ESRI
Redlands, California

Appendix B
Isolated Wetlands Ohio EPA Permit Approval

Ohio EPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
50 West Town Street, Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, Ohio 43216-1049

July 25, 2008

Timothy Morgan
Ravenna TLS
1438 State Route 534 SW
Newton Falls, OH, 44444

via E-Mail

Re: Complete Isolated Wetland Level 1 Permit Application

Dear Applicant:

The following application was reviewed by DSW:

Project Name	Authorized Agent	County	Received	SWIMS ID
RTI Group 2 Heavy Equip. Training Area	Timothy Morgan	Portage	2nd Submittal	083389

Effective July 17, 2001, pursuant to Ohio Revised Code (ORC), the application cited above is considered **COMPLETE** since it provided all the required items identified in Section 6111.022(B).

Ohio EPA is also required to review that application within 15 business days of submission and to notify the applicant whether the application is considered complete, or not. This letter constitutes that notification.

Ed Wilk has been assigned as the reviewer for this project. He can be reached at 330-963-1172.

If you have any questions regarding the information that has been presented, please contact me at (614) 644-2012.

Sincerely,

Jeff Boyles,
Application Coordinator, 401/Wetlands Section

cc: Ed Wilk, 401 Reviewer

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Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

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THE ADJUTANT GENERAL'S DEPARTMENT
RAVENNA TRAINING AND LOGISTICS SITE
1438 State Route 534 SW
Newton Falls, OH 44444

Mitigation Proposal
for
RTI Group 2 Heavy Equipment Training Area Isolated Wetlands Fill Permit

I. Mitigation Requirement: The Ohio Army National Guard (OHARNG) is required to mitigate for filling of 0.06 acres of category 2 forested wetland and 0.44 acres of category 1 non-forested wetland as identified in this Pre-Activity Notice (PAN). In accordance with division (F) of rule 3745-1-54 of the Ohio Administrative code the forested wetland must be mitigated at a ratio of 2:1 and the non-forested wetland at a ratio of 1.5:1. The total mitigation required is (0.06 x 2) + (0.44 x 1.5) = 0.78 acres.

II. Mitigation Site Description: The wetland mitigation site is with the same watershed as the fill site – 05030103 (Mahoning River). The mitigation was actually constructed in the fall of 2007 in conjunction with an Army funded project. At that time the OHARNG was finalizing the Environmental Assessment for standing up an Engineer School at the RTLS, of which the Group 2 Heavy Equipment Training Area project is a part, and we knew wetland mitigation would be needed. When the opportunity to have the Army construct our mitigation presented itself we could not pass it up. Both the Ohio EPA and the US Army Corps of Engineers (USACE) were contacted for consultation during the planning phase of the mitigation site. The Ohio EPA indicated that they were not able to assist unless the OHARNG had a fill permit pending and directed us to the USACE. The USACE did not respond when contacted.

The mitigation site was a former Defense Logistics Agency (DLA) strategic materials storage area within the RTLS where dry materials were stored in large above ground storage tanks. The materials were removed and the site was slated for fill and leveling. The site showed the propensity to hold water and looked like a good site for wetland creation so the OHARNG requested that instead of filling the site that wetlands be created. Because there was no added cost to the contract the Army modified their scope of work and had their contractor turn the Route 80 Tank Farm Area into a wetland. Nine (9) shallow basins were created within the mitigation area and were seeded with a combination upland/wetland seed mix.

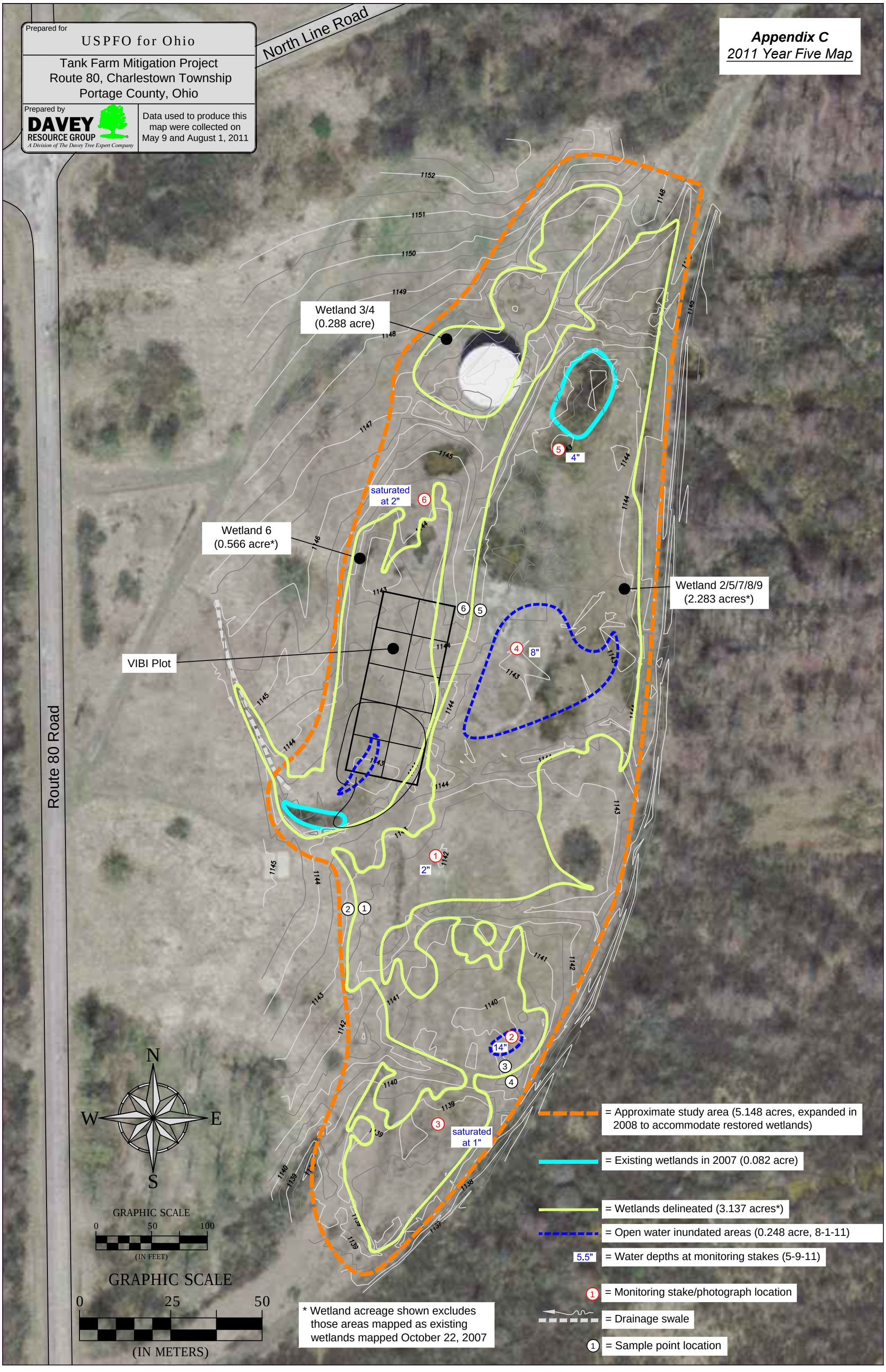
Included with this mitigation proposal is an excerpt from the Final Completion Report for the DLA Route 80 Tank Removal and an as built map of the wetland mitigation area from that same report. Also included is the Year One Monitoring and Management Report of the mitigation site. This report was done shortly after the construction and provides detailed information on the mitigation.

III. Mitigation Goal and Monitoring: The goal of the mitigation is to create a minimum of 0.78 acres of category 2 or better wetland. Most of the basins are expected to develop into emergent wet meadow type wetlands with the basins near the eastern edge probably developing into scrub shrub and forested wetlands as seed from adjacent areas is introduced. The OHARNG intends to allow wetland diversity to develop as seed is introduced and will only control invasive and non-native species.

The OHARNG has a contract in place with Davey Resources Group to monitor the wetland over a five year period to ensure proper development.

IV. Protection of the Wetland Mitigation: The RTLS is federally owned property controlled by the United States Property and Fiscal Officer (USP&FO) for Ohio who is a representative of the National Guard Bureau (NGB) in Alexandria, VA. The property is licensed to the OHARNG who manages the property and natural resources for NGB. The OHARNG and NGB are required to comply with State and Federal environmental laws and regulations to include the protection of wetlands. All OHARNG activities on the training site that involve earth moving, construction, development and off-road activity are coordinated and reviewed by environmental personnel to ensure wetlands are avoided as much as possible, unavoidable impacts are minimized, and mitigation sites are protected.

The OHARNG has an active Natural Resources Management Program at the RTLS and is required by the SIKES Act Improvement Act to have an Integrated Natural Resources Management Plan (INRMP). This plan is developed in cooperation with, and with the signatory concurrence of, the U.S. Fish and Wildlife Service (USF&WS) and the Ohio Department of Natural (DNR) Resources. The INRMP is reviewed by the OHARNG, USF&WS, and Ohio DNR annually and updated every five years as necessary. It has visibility with agencies outside of the NGB and OHARNG and is an appropriate venue to document and track protection of wetland mitigation areas. The OHARNG will develop GIS data and a Wetland Mitigation Map for insertion into the INRMP that identifies all wetland mitigation sites at the RTLS and earmarks them for protection and maintenance as wetlands in perpetuity. Mitigation site protection will be monitored by the OHARNG environmental staff and by annual reviews of the RTLS INRMP.


Prepared for
USPFO for Ohio
Tank Farm Mitigation Project
Route 80, Charlestown Township
Portage County, Ohio
Prepared by
DAVEY RESOURCE GROUP
A Division of The Davey Tree Expert Company
Data used to produce this map were collected on May 9 and August 1, 2011
North Line Road
Route 80 Road
Appendix C
2011 Year Five Map
Wetland 3/4 (0.288 acre)
Wetland 6 (0.566 acre*)
Wetland 2/5/7/8/9 (2.283 acres*)
VIBI Plot
saturated at 2"
4"
8"
2"
14"
saturated at 1"
N
S
E
W
GRAPHIC SCALE
0 50 100
(IN FEET)
GRAPHIC SCALE
0 25 50
(IN METERS)
* Wetland acreage shown excludes those areas mapped as existing wetlands mapped October 22, 2007
= Approximate study area (5.148 acres, expanded in 2008 to accommodate restored wetlands)
= Existing wetlands in 2007 (0.082 acre)
= Wetlands delineated (3.137 acres*)
= Open water inundated areas (0.248 acre, 8-1-11)
5.5" = Water depths at monitoring stakes (5-9-11)
1 = Monitoring stake/photograph location
= Drainage swale
1 = Sample point location

Appendix D
Photographs, Quadrat Descriptions, and Vegetation Coverage

Summary of Data at Monitoring Quadrat 1

Photograph 1 (8-1-11). Monitoring Quadrat 1 is located near the center of the mitigation area in Wetland 2/5/7 (formerly Cell 7). This photograph was taken facing east.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
0.5	2”	1”	1.5”	saturated to surface	2”	saturated at 3” sediment deposits	2”	saturated to surface

Soil Data Summary

2007	2008	2009	2010	2011
non-hydric	non-hydric	non-hydric	hydric	hydric

Vegetation Summary at Monitoring Quadrat 1

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	14%	34%	95%	100%
Percent Areal Cover Invasive Species					0%	0%	0%	0%	0%
Percent Unvegetated Open Water					0%	70%	0%	0%	0%
Percent Unvegetated Bare Ground					97%	0%	49%	0%	0%
Alisma subcordatum	southern water-plantain	OBL	perennial	2				20%	
Ambrosia artemesiifolia	annual ragweed	FACU	annual	0			2%		
Aster sp.	aster	n/a	n/a	n/a				5%	
Carex sp.	sedge	n/a	n/a	n/a		2%			
Echinochloa muricata	rough barnyard grass	FACW+	annual	3		10%			
Festuca sp.	fescue	n/a	n/a	n/a		2%			
Juncus effusus	soft rush	FACW+	perennial	1				5%	10%
Juncus torreyi	Torrey’s rush	FACW	perennial	3		2%		5%	10%
Ludwigia palustris	water-purslane	OBL	annual	3				25%	40%
Lycopus americanus	American water-horehound	OBL	perennial	3				5%	15%
Populus deltoides	eastern cottonwood	FAC	perennial	3					1%
Salix discolor	pussy willow	FACW	perennial	3					10%
Salix sp.	willow	n/a	perennial	n/a		2%	2%	15%	
Scirpus pendulus	drooping bulrush	OBL	perennial	2					2%
Trifolium sp.	clover	n/a	n/a	n/a	1%				
Typha latifolia	broad-leaved cat-tail	OBL	perennial	1		10%	30%	40%	40%
unknown grass seedlings	n/a	n/a	n/a	n/a	2%	2%	15%		
Verbena hastata	blue vervain	FACW+	perennial	4			2%		1%

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring.

Summary of Data at Monitoring Quadrat 2

Photograph 2 (8-1-11). Monitoring Quadrat 2 is located in the southeastern portion of the mitigation wetlands in Wetland 8. This photograph was taken facing southeast.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
14”	14”	14”	16”	10”	14”	7”	14”	4”

Soil Data Summary

2007	2008	2009	2010	2011
non-hydric	non-hydric	non-hydric	hydric	hydric

Vegetation Summary at Monitoring Quadrat 2

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	0%	0%	40%	5%
Percent Areal Cover Invasive Species					0%	0%	0%	0%	25%
Percent Unvegetated Open Water					100%	100%	100%	60%	70%
Percent Unvegetated Bare Ground					0%	0%	0%	0%	0%
no vegetation	n/a	n/a	n/a	n/a	100%				
Alisma subcordatum	southern water-plantain	OBL	perennial	2				5%	5%
Chara sp.	stonewort	n/a	n/a	n/a			25%	25%	X
Typha angustifolia	narrow-leaved cat-tail	OBL	perennial	*					25%
Typha latifolia	broad-leaved cat-tail	OBL	perennial	1		10%	30%	35%	

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring. Species denoted with an “x” are present during spring monitoring but not during summer monitoring.

Summary of Data at Monitoring Quadrat 3

Photograph 3 (8-1-11). Monitoring Quadrat 3 is located in the southern portion of the mitigation area in Wetland 9. This photograph was taken facing west.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
-	sat. to surface	sat. to surface	sat. to surface	-	sat. to surface	watermarks, sediment deposits	sat. at 1" water at 5"	blackened leaves

Soil Data Summary

2007	2008	2009	2010	2011
hydric	hydric	hydric	hydric	hydric

Vegetation Summary at Monitoring Quadrat 3

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	67%	32%	100%	87%
Percent Areal Cover Invasive Species					5%	10%	10%	0%	0%
Percent Unvegetated Open Water					0%	0%	0%	0%	0%
Percent Unvegetated Bare Ground					73%	0%	0%	0%	0%
Achillea millefolium	yarrow	FACU	perennial	1	2%		5%		
Agrostis gigantea	redtop	FACW	perennial	*		30%	10%	25%	20%
Apocynum cannabinum	Indian hemp	FACU	perennial	1	5%	15%	10%	5%	25%
Carex lurida	bottlebrush sedge	OBL	perennial	3				5%	
Carex sp.	sedge	n/a	n/a	n/a			5%		
Cyperus esculentus	yellow nut-sedge	FACW	perennial	0		5%			
Daucus carota	Queen-Anne's-lace	UPL	biennial	*	3%	30%	2%		
Eleagnus umbellata (shrub)	autumn-olive	FACU	perennial	*	5%	10%	10%		
Festuca sp.	fescua	n/a	n/a	n/a		5%			
Fragaria virginiana	wild strawberry	FACU	perennial	1	1%	5%	5%	5%	5%
Holcus lanatus	velvet grass	FACU	perennial	*		5%	5%	10%	
Hypericum sp.	St. John's wort	n/a	n/a	n/a				5%	
Juncus effusus	soft rush	FACW+	perennial	1				10%	10%
Juncus tenuis	path rush	FAC-	perennial	1				20%	10%
Lycopus americanus	American water-horehound	OBL	perennial	3					5%
Malus sp.	crabapple sp.	n/a	n/a	n/a		1%			
Medicago lupulina	black medick	UPL	annual	*		30%	5%		
Melilotus sp.	sweet clover	n/a	biennial	*	1%		10%	2%	
Panicum clandestinum	deer's-tongue panic grass	FAC+	perennial	2					10%
Panicum dichotomiflorum	fall panic grass	FACW-	annual	0				5%	
Panicum virgatum	switch grass	FAC	perennial	4					5%
Poa sp.	grass sp.	n/a	n/a	n/a		15%	15%		
Populus deltoides	eastern cottonwood	FAC	perennial	3		1%	2%	10%	
Populus deltoides (shrub)	eastern cottonwood	FAC	perennial	3				30%	
Populus tremuloides (shrub)	quaking aspen	FACU	perennial	2	10%	15%	15%		25%
Potentilla simplex	old field cinquefoil	FACU-	perennial	1			2%	5%	5%
Pycnanthemum tenuifolium	narrow-leaved mountain-mint	FACW	perennial	4				5%	5%
Rudbeckia hirta	black-eyed Susan	FACU-	perennial	1			5%	10%	2%
Salix discolor	pussy willow	FACW	perennial	3				10%	
Salex etigua (shrub)	sandbar willow	OBL	perennial	1					35%
Salix sp.	willow	n/a	perennial	n/a		10%	35%		
Salix sp. (shrub)	willow	n/a	perennial	n/a				30%	
Scirpus pendulus	drooping bulrush	OBL	perennial	2			10%		
Sisyrinchium angustifolium	stout blue-eyed grass	FACW-	perennial	2				10%	
Solidago canadensis	Canada goldenrod	FACU	perennial	1		5%	15%	10%	10%
Solidago juncea	plume goldenrod	UPL	perennial	2		2%			
Solidago rugosa	rough goldenrod	FAC	perennial	2			10%	10%	2%
Solidago sp.	goldenrod	N/A	n/a	n/a		15%			
Trifolium sp.	clover	n/a	n/a	n/a			2%		

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring.

Summary of Data at Monitoring Quadrat 4

Photograph 4 (8-1-11). Monitoring Quadrat 4 is located in the central portion of the mitigation area in Wetland 2/5/7 (formerly Cell 7). This photograph was taken facing southeast.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
2.5”	9”	7”	9”	4”	9”	5”	8”	4”

Soil Data Summary

2007	2008	2009	2010	2011
non-hydric	non-hydric	non-hydric	hydric	hydric

Vegetation Summary at Monitoring Quadrat 4

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	0%	0%	15%	0%
Percent Areal Cover Invasive Species					0%	0%	0%	0%	0%
Percent Unvegetated Open Water					0%	100%	100%	80%	100%
Percent Unvegetated Bare Ground					100%	0%	0%	0%	0%
no vegetation	n/a	n/a	n/a	n/a	100%				
Chara sp.	stonewort	n/a	n/a	n/a				20%	X
Stuckenia pectinata	sago pondweed	OBL	perennial	2				15%	

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring. Species denoted with an “x” are present during spring monitoring but not during summer monitoring

Summary of Data at Monitoring Quadrat 5

Photograph 5 (9-1-11). Monitoring Quadrat 5 is located in in the northern portion of the mitigation area in Wetland 2/5/7 (formerly Cell 7). This photograph was taken facing north.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
5.5”	7”	5”	6”	2.5”	4”	4”	7”	1”

Soil Data Summary

2007	2008	2009	2010	2011
non-hydric	non-hydric	non-hydric	hydric	hydric

Vegetation Summary at Monitoring Quadrat 5

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	57%	80%	55%	80%
Percent Areal Cover Invasive Species					0%	10%	0%	5%	20%
Percent Unvegetated Open Water					80%	0%	0%	0%	0%
Percent Unvegetated Bare Ground					10%	0%	0%	0%	0%
Alisma subcordatum	southern water-plantain	OBL	perennial	2		30%	25%	25%	10%
Eleagnus umbellata	autumn-olive	FACU	perennial	*		10%			
Eleocharis obtusa	blunt spike-rush	OBL	annual	1		40%	25%	20%	10%
Juncus acuminatus	sharp-fruited rush	OBL	perennial	4				20%	20%
Juncus torreyi	Torrey’s rush	FACW	perennial	3					
Lemna minor	common duckweed	OBL	annual	3				X	5%
Ludwigia palustris	water-purslane	OBL	annual	3		15%	40%	30%	25%
Phragmites australis	giant reed	FACW	perennial	0				5%	
Populus deltoides	eastern cottonwood	FAC	perennial	3		15%			20%
Salix sp.	willow	n/a	n/a	n/a		10%			
Typha latifolia	broad-leaved cat-tail	OBL	perennial	1		2%	15%	10%	25%
unknown grass seedlings	n/a	n/a	n/a	n/a	10%	25%			

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring. Species denoted with an “x” are present during spring monitoring but not during summer monitoring

Summary of Data at Monitoring Quadrat 6

Photograph 6 (8-1-11). Monitoring Quadrat 6 is located in the western portion of the mitigation area in Wetland 6. This photograph was taken facing north.

Water Level Summary

2007	2008		2009		2010		2011	
Oct-22	May-5	July-29	May-8	July-14	May-3	July-19	May-9	Aug-1
-	sediment deposits	-	-	-	-	-	sat. at 2”	-

Soil Data Summary

2007	2008	2009	2010	2011
non-hydric	non-hydric	non-hydric	non-hydric	non-hydric

Vegetation Summary at Monitoring Quadrat 6

Scientific Name	Common Name	Indicator Status	Habit	C of C[1]	Year 1 2007[2]	Year 2 2008[2]	Year 3 2009[2]	Year 4 2010[2]	Year 5 2011[2]
Percent Areal Cover Native Perennial Hydrophytes					0%	24%	16%		80%
Percent Areal Cover Invasive Species					0%	0%	0%		0%
Percent Unvegetated Open Water					0%	0%	0%		0%
Percent Unvegetated Bare Ground					100%	0%	0%		0%
Agrostis gigantea	redtop	FACW	perennial	*			5%	25%	
Ambrosia artemisiifolia	common ragweed	FACU	annual	0		25%			
Anthoxanthum odoratum	sweet vernal grass	FACU	perennial	*			15%	20%	
Aster lateriflorus	calico aster	FACW-	perennial	2				2%	10%
Brassica nigra	black mustard	UPL	annual	*		5%			
Carex sp.	sedge	n/a	n/a	n/a					X
Chrysanthemum leucanthemum	ox-eye daisy	UPL	perennial	*				10%	
Daucus carota	Queen-Anne’s-lace	UPL	biennial	*			5%	5%	
Erigeron annuus	daisy fleabane	FACU	annual	0		1%	15%	5%	
Equisetum arvense	field horsetail	FAC	perennial	0		8%			10%
Eupatorium perfoliatum	common boneset	FACW+	perennial	3				2%	
Euthamia graminifolia	flat-topped goldenrod	FAC	perennial	2				10%	15%
Juncus effusus	soft rush	FACW+	perennial	1					5%
Juncus tenuis	path rush	FAC-	perennial	1				5%	10%
Medicago lupulina	black medick	UPL	annual	*		10%			
Melilotus alba	white sweet-clover	FACU-	biennial	*		1%	20%		
Melilotus officinalis	yellow sweet-clover	FACU-	biennial	*			10%		
Mimulus ringens	common monkey-flower	OBL	perennial	4		1%			
Onoclea sensibilis	sensitive fern	FACW	perennial	2				1%	
Panicum dichotomiflorum	fall panic grass	FACW-	annual	0				5%	
Panicum clandestinum	deer’s-tongue panic grass	FAC+	perennial	2					15%
Panicum sp.	panic grass	n/a	n/a	n/a			2%		
Poa sp.	bluegrass	n/a	n/a	n/a		5%			10%
Phleum pratense	timothy	FACU	perennial	*		15%	15%	20%	
Plantago lanceolata	English plantain	UPL	perennial	*				2%	
Potentilla simplex	old field cinquefoil	FACU-	perennial	1				5%	
Pycnanthemum tenuifolium	narrow-leaved mountain-mint	FACW	perennial	4		15%			5%
Rosa multiflora	multiflora rose	FACU	perennial	*				X	
Salix exigua	sandbar willow	OBL	perennial	1					5%
Salix sp.	willow	n/a	perennial	n/a			5%	5%	
Scirpus pendulus	drooping bulrush	OBL	perennial	2			5%		
Sisyrinchium angustifolium	stout blue-eyed-grass	FACW-	perennial	2				5%	
Solidago sp.	goldenrod sp.	n/a	n/a	n/a		1%			
Trifolium hybridum	alsike clover	FACU-	perennial	*		40%	20%		2%
Trifolium repens	white clover	FACU-	perennial	*			15%		
Trifolium sp.	clover	n/a	n/a	n/a					2%
Verbena hastata	blue vervain	FACW+	perennial	4			1%		5%

[1] C of C scores as well as scientific and common plant names are obtained from Andreas, et. al. (2004). Non-native species are denoted with an asterisk in the C of C column and have no score.

[2] Species are represented in the yearly totals as percent cover at the time of summer monitoring. Species denoted with an “x” are present during spring monitoring but not during summer monitoring.

Appendix E
Vegetation, Soils, and Hydrology Data Sheets for Each Monitoring Point

Data Sheets Summary Table

Monitoring Quadrat	Hydric Soil	Wetlands Hydrology	Percent Wetlands Vegetation	Jurisdictional Wetlands	Comments
1	Yes	Yes	100	Yes	Emergent wetland
2	No	No	0	No	Upland old field
3	Yes	Yes	100	Yes	Shallow emergent marsh
4	No	No	0	No	Upland old field
5	Yes	Yes	100	Yes	Shallow emergent marsh
6	No	No	0	No	Upland old field

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 01

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

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

Emergent wetland

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ○ No ◉	Depth (inches):	
Water Table Present?	Yes ◉ No ○	Depth (inches):	1
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches):	

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: 01

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Typha latifolia	20	☑	20.0%	OBL
2. Juncus effusus	40	☑	40.0%	FACW+
3. Euthamia graminifolia	20	☑	20.0%	FAC
4. Agrostis alba	20	☑	20.0%	FACW
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	100		= Total Cover	

Woody Vine Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	20	x 1 =	20	
FACW species	60	x 2 =	120	
FAC species	20	x 3 =	60	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	100 (A)		200	(B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-1	10YR	4/3								
1-7	10YR	4/2	95%	10YR	5/6	5%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

gravel and rock below 7"

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 02

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

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

Upland old field

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ○ No ◉	Depth (inches): ____	
Water Table Present?	Yes ○ No ◉	Depth (inches): ____	**Wetland Hydrology Present?** Yes ○ No ◉
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches): ____	

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

Remarks:

No hydrological indicators

VEGETATION - Use scientific names of plants

Sampling Point: 02

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Daucus carota	20	☑	33.3%	UPL
2. Dactylis glomerata	20	☑	33.3%	FACU
3. Trifolium hybridum	20	☑	33.3%	FACU-
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	60		= Total Cover	

Woody Vine Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	40	x 4 =	160	
UPL species	20	x 5 =	100	
Column Totals:	60	(A)	260	(B)

Prevalence Index = B/A = 4.333

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

Festuca sp. (40 percent) also present

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-2	10YR	4/2							Silt Loam	
2-10	10YR	4/3	95%	10YR	5/6	5%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

gravel and rock below 10"

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 03

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

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

Shallow emergent marsh

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ◉ No ○	Depth (inches): 3	
Water Table Present?	Yes ○ No ◉	Depth (inches): ____	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches): ____	

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

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: 03

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Typha latifolia	80	☑	80.0%	OBL
2. Alisma plantago-aquatica	10	☐	10.0%	OBL
3. Ludwigia palustris	10	☐	10.0%	OBL
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	100		= Total Cover	

Woody Vine Stratum (Plot size: _____)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= 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:	1	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	100	x 1 =	100	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	100	(A)	100	(B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-3	10YR	4/1							Silt Loam	
3-12	10YR	4/2	95%	10YR	5/6	5%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 04

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

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

Upland old field

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ○ No ◉	Depth (inches): ____	
Water Table Present?	Yes ○ No ◉	Depth (inches): ____	**Wetland Hydrology Present?** Yes ○ No ◉
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches): ____	

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

Remarks:

No hydrological indicators

VEGETATION - Use scientific names of plants

Sampling Point: 04

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Trifolium hybridum	30	☑	42.9%	FACU-
2. Dactylis glomerata	20	☑	28.6%	FACU
3. Daucus carota	10	☐	14.3%	UPL
4. Agrostis alba	10	☐	14.3%	FACW
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	70		= Total Cover	

Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	10	x 2 =	20	
FAC species	0	x 3 =	0	
FACU species	50	x 4 =	200	
UPL species	10	x 5 =	50	
Column Totals:	70	(A)	270	(B)

Prevalence Index = B/A = 3.857

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-5	10YR	4/3							Silt Loam	
5-10	10YR	4/3	90%	10YR	5/4	10%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 05

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

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

Shallow emergent marsh

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ◉ No ○	Depth (inches): 3	
Water Table Present?	Yes ○ No ◉	Depth (inches): ____	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches): ____	

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

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: 05

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Typha latifolia	80	☑	88.9%	OBL
2. Phragmites australis	10	☐	11.1%	FACW
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	90		= Total Cover	

Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= 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:	1	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	80	x 1 =	80	
FACW species	10	x 2 =	20	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	90 (A)		100	(B)

Prevalence Index = B/A = 1.111

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 05

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-3	10YR	4/1							Loam	
3-8	10YR	4/1	90%	10YR	5/6	5%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Tank Farm Wetland Mitigation Site **City/County:** Charlestown Township, Portage County **Sampling Date:** 09-May-11

Applicant/Owner: USPFO for Ohio **State:** Ohio **Sampling Point:** 06

Investigator(s): Todd Crandall **Section, Township, Range: S.** ____ **T.** ____ **R.** ____

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR R **Lat.:** ____ **Long.:** ____ **Datum:** ____

Soil Map Unit Name: Disturbed soils **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 ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

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

Upland old field

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of 2 required)

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

Field Observations:

Surface Water Present?	Yes ○ No ◉	Depth (inches): ____	
Water Table Present?	Yes ○ No ◉	Depth (inches): ____	**Wetland Hydrology Present?** Yes ○ No ◉
Saturation Present? (includes capillary fringe)	Yes ○ No ◉	Depth (inches): ____	

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

Remarks:

No hydrological indicators

VEGETATION - Use scientific names of plants

Sampling Point: 06

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0		= Total Cover	

Herb Stratum (Plot size: 5 feet)				
1. Trifolium pratense	30	☑	50.0%	FACU-
2. Taraxacum officinale	20	☑	33.3%	FACU-
3. Plantago major	10	☐	16.7%	FACU
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	60		= Total Cover	

Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	0		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	60	x 4 =	240	
UPL species	0	x 5 =	0	
Column Totals:	60	(A)	240	(B)

Prevalence Index = B/A = 4.000

Hydrophytic Vegetation Indicators:

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

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

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 (1m) tall..

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

Woody vine - 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.)

festuca sp. (50 percent) also present

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: 06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-4	10YR	4/3							Silt Loam	
4-12	10YR	4/3	90%	10YR	5/4	10%	C	PL	Silt Loam	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : [3]

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Appendix F
Definition of Wetlands Vegetation Indicator Status (from Reed, 1988)

Obligate Wetlands (OBL). Occur almost always (estimated probability is greater than 99%) under natural conditions in wetlands.

Facultative Wetlands (FACW). Usually occur in wetlands (estimated probability 67–99%) but occasionally found in non-wetlands.

Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34–66%).

Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67–99%) but occasionally found in wetlands (estimated probability 1–33%).

Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability > 99%) under natural conditions in non-wetlands in the region specified. If a species does not occur in wetlands in any region, it is not on the *National List*.

Species for which little or no information was available to base an indicator status were assigned a no indicator (NI) status. An asterisk (*) after the indicator status indicates that the indicator status was based on limited ecological information.

The wetlands indicator categories should not be equated to degrees of wetness. Many obligate wetlands species occur in permanently or semipermanently flooded wetlands, but a number of obligates also occur and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands) to species in which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semipermanently flooded wetlands.

Davey Resource Group has added two additional indicators for situations when plants can only be identified to genus. A Wetlands Indicator Species (WIS) is a plant that is most likely obligate wetlands, facultative wetlands, or facultative. An Upland Indicator Species (UIS) is a plant that is most likely indicative of upland or facultative upland conditions. These additional indicators are used when species identification is not possible. A variety of factors are part of the UIS and WIS assignments. Indicator statuses of all locally occurring members of the genus in question are considered, as are the health and size of the population and the indicator status of nearby plants.

Prepared for
USPFO for Ohio
Tank Farm Mitigation Project
Route 80, Charlestown Township,
Portage County, Ohio
Prepared by
DAVEY RESOURCE GROUP
A Division of The Davey Tree Expert Company
Data used to produce this map were collected on May 9 and August 1, 2011
North Line Road
Appendix G
2011 Year Five Map with Vegetation Communities
Wetland 3/4 (0.288 acre)
Wetland 6 (0.566 acre*)
Wetland 2/5/7/8/9 (2.283 acres*)
VIBI Plot
Route 80 Road
N
W
E
S
GRAPHIC SCALE
0
50
100
(IN FEET)
GRAPHIC SCALE
0
25
50
(IN METERS)
* Wetland acreage shown excludes those areas mapped as existing wetlands mapped on October 22, 2007
= Approximate study area (5.149 acres, expanded in 2008 to accommodate restored wetlands)
= Upland Old Field (1.914 acres)
= Shrub Thicket (0.032 acre)
= Open Water (0.249 acre)
= Marsh (1.159 acres)
= Wet Meadow (1.613 acres)
= Scrub/Shrub Wetlands (0.182 acre)

Appendix H
Plant Species Found at Ravenna Training and Logistics Site (RTLS) Route 80, Tank Farm Wetlands Mitigation Site

Scientific Name[1]	Common Name[1]	Indicator Status[1]	C of C score[1]	Habit[1]	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
Acer rubrum	red maple	FAC	2	perennial		X	X	X	X
Achillea millefolium	yarrow	FACU	1	perennial	X	X	X	X	X
Agrimonia parviflora	small-flowered agrimony	FAC	2	perennial	X	X	X	X	X
Agrostis gigantea	redtop	FACW	*	perennial		X	X	X	X
Alisma subcordatum	southern water-plantain	OBL	2	perennial		X	X	X	X
Allium sp.	onion	n/a	n/a	n/a					X
Ambrosia artemisiifolia	annual ragweed	FACU	0	annual		X	X	X	X
Anthoxanthum odoratum	sweet vernal grass	FACU	*	perennial			X	X	X
Apocynum cannabinum	Indian hemp	FACU	1	perennial	X	X	X	X	X
Arabis glabra	tower mustard	UPL	3	biennial		X	X	X	X
Asclepias incarnata	swamp milkweed	OBL	4	perennial					X
Aster lateriflorus	calico aster	FACW-	2	perennial	X	X	X	X	X
Aster sp.	aster	n/a	n/a	n/a					X
Bidens frondosa	devil's beggar's-tick	FACW	2	annual		X	X	X	X
Brassica nigra	black mustard	UPL	*	annual		X	X	X	X
Bromus inermis	Hungarian brome	UPL	*	perennial		X	X	X	X
Carex hystericina	porcupine sedge	OBL	5	perennial				X	X
Carex sp.	sedge sp.	n/a	n/a	perennial		X	X	X	X
Carex lurida	bottlebrush sedge	OBL	3	perennial			X	X	X
Carex scoparia	pointed broom sedge	FACW	3	perennial			X	X	X
Carex vulpinoidea	fox sedge	OBL	1	perennial		X	X	X	X
Centaurea maculata	spotted knapweed	UPL	*	biennial					X
Centaurium umbellatum	centaury	FAC-	*	annual			X	X	X
Cerastium vulgatum	common chickweed	FACU-	*	perennial			X	X	X
Chrysanthemum leucanthemum	ox-eye daisy	UPL	*	perennial		X	X	X	X
Cichorium intybus	chicory	UPL	*	perennial		X	X	X	X
Cirsium arvense	Canada thistle	FACU	*	perennial			X	X	X
Coreopsis lanceolata	long-stalked tickseed	FACU	*	perennial			X	X	X
Cornus amomum	silky dogwood	FACW	2	perennial	X	X	X	X	X
Cornus racemosa	gray dogwood	FAC-	1	perennial		X	X	X	X
Cyperus esculentus	yellow nut-sedge	FACW	0	perennial		X	X	X	X
Daucus carota	Queen-Anne's-lace	UPL	*	biennial	X	X	X	X	X
Dianthus armeria	Deptford-pink	UPL	*	annual			X	X	X
Dipsacus fullonum	wild teasel	FACU-	*	biennial	X	X	X	X	X
Echinochloa muricata	rough barnyard grass	FACW+	3	annual		X	X	X	X

Scientific Name[1]	Common Name[1]	Indicator Status[1]	C of C score[1]	Habit[1]	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
Eleagnus umbellata	autumn-olive	FACU	*	perennial	X	X	X	X	X
Eleocharis erythropoda	red-footed spikerush	OBL	4	perennial					X
Eleocharis obtusa	blunt spike-rush	OBL	1	annual		X	X	X	X
Eleocharis palustris	small's spike-rush	OBL	5	perennial			X	X	X
Elymus virginicus	Virginia wild rye	FACW-	3	perennial				X	X
Elytrigia repens	quackgrass	FACU-	*	perennial			X	X	X
Epilobium coloratum	purple-leaved willow-herb	OBL	1	perennial				X	X
Epilobium hirsutum	hairy willow-herb	FACW	*	perennial			X	X	X
Equisetum arvense	field horsetail	FAC	0	perennial	X	X	X	X	X
Equisetum hyemale	scouring-rush	FACW	2	perennial				X	X
Erechtites hieraciifolia	pilewort	FACU	2	annual	X		X	X	X
Erigeron annuus	daisy fleabane	FACU	0	annual		X		X	X
Erigeron philadelphicus	Philadelphia fleabane	FACU	2	biennial			X	X	X
Eupatorium perfoliatum	common boneset	FACW+	3	perennial				X	X
Euthamia graminifolia	flat-topped goldenrod	FAC	2	perennial	X	X	X	X	X
Festuca sp.	fescue	n/a	n/a	perennial		X	X	X	X
Filaginella uliginosum	low cudweed	FAC	*	perennial		X	X	X	X
Fragaria virginiana	wild strawberry	FACU	1	perennial	X	X	X	X	X
Fraxinus pennsylvanica	green ash	FACW	3	perennial	X	X	X	X	X
Gnaphalium obtusifolium	fragrant cudweed	UPL	2	annual				X	X
Holcus lanatus	velvet grass	FACU	*	perennial		X	X	X	X
Hordeum jubatum	squirrel-tail barley	FAC	*	perennial		X	X	X	X
Hypericum mutilum	slender St. John's-wort	FACW	3	annual		X	X	X	X
Hypericum perforatum	common St. John's-wort	UPL	*	perennial			X	X	X
Juncus acuminatus	sharp-fruited rush	OBL	4	perennial			X	X	X
Juncus bufonius	toad rush	FACW	2	annual		X	X	X	X
Juncus dudleyi	Dudley's rush	FACW-	3	perennial					X
Juncus effusus	soft rush	FACW+	1	perennial	X	X	X	X	X
Juncus marginatus	grass-leaved rush	FACW	4	perennial		X	X	X	X
Juncus tenuis	path rush	FAC-	1	perennial		X	X	X	X
Juncus torreyi	Torrey's rush	FACW	3	perennial		X	X	X	X
Leersia oryzoides	rice cut grass	OBL	1	perennial	X	X	X	X	X
Lemna minor	common duckweed	OBL	3	annual			X	X	X
Lepidium campestre	field pepper-grass	UPL	*	annual		X	X	X	X
Lobelia inflata	Indian-tobacco	FACU	1	annual				X	X
Lolium perenne	perennial ryegrass	FACU-	*	perennial		X	X	X	X
Lotus corniculatus	bird's-foot trefoil	FACU-	*	perennial			X	X	X
Ludwigia alternifolia	seedbox	FACW+	3	perennial			X	X	X
Ludwigia palustris	water-purslane	OBL	3	annual	X	X	X	X	X
Lycopus americanus	American water-horehound	OBL	3	perennial	X	X	X	X	X
Lysimachia ciliata	fringed loosestrife	FACW	4	perennial		X	X	X	X

Scientific Name[1]	Common Name[1]	Indicator Status[1]	C of C score[1]	Habit[1]	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
Lysimachia nummularia	moneywort	OBL	*	perennial		X	X	X	X
Malus sp.	crabapple	n/a	n/a	perennial		X	X	X	X
Medicago lupulina	black medick	UPL	*	annual		X	X	X	X
Melilotus alba	white sweet-clover	FACU-	*	biennial		X	X	X	X
Melilotus officinalis	yellow sweet-clover	FACU-	*	biennial		X	X	X	X
Melilotus sp.	sweet-clover	n/a	*	biennial	X	X	X	X	X
Mimulus ringens	common monkey-flower	OBL	4	perennial	X	X	X	X	X
Najas minor	Eurasian water-nymph	OBL	*	annual		X	X	X	X
Onoclea sensibilis	sensitive fern	FACW	2	perennial	X		X	X	X
Panicum capillare	witch grass	FAC-	1	annual	X		*X*	*X*	*X*
Panicum clandestinum	deer's-tongue panic grass	FAC+	2	perennial				X	X
Panicum dichotomiflorum	fall panic grass	FACW-	0	annual			X	X	X
Panicum virgatum	switch grass	FAC	4	perennial				X	X
Penstemon digitalis	foxglove beard-tongue	FAC	2	perennial		X	X	X	X
Penthorum sedoides	ditch-stonecrop	OBL	2	perennial					X
Phalaris arundinacea	reed canary grass	FACW+	0	perennial			X	X	X
Phleum pratense	timothy	FACU	*	perennial		X	X	X	X
Phragmites australis	giant reed	FACW	0	perennial	X	X	X	X	X
Phyla lanceolata	fog-fruit	OBL	3	perennial				X	X
Phytolacca americana	pokeweed	FACU+	1	perennial	X	X	X	X	X
Plantago lanceolata	English plantain	UPL	*	perennial		X	X	X	X
Plantago major	common plantain	FACU	*	perennial		X	X	X	X
Poa sp.	bluegrass	n/a	n/a	perennial		X	X	X	X
Polygonum pensylvanicum	pinkweed	FACW	0	annual	X	X	X	X	X
Populus deltoides	eastern cottonwood	FAC	3	perennial		X	X	X	X
Populus tremuloides	quaking aspen	FACU	2	perennial	X	X	X	X	X
Potamogeton nodosus	long-leaved pondweed	OBL	3	perennial		X	X	X	X
Potentilla simplex	old field cinquefoil	FACU-	1	perennial	X	X	X	X	X
Prunella vulgaris	self-heal	FACU+	0	perennial		X	X	X	X
Prunus virginiana	choke cherry	FACU	2	perennial			X	X	X
Pycnanthemum tenuifolium	narrow-leaved mountain-mint	FACW	4	perennial		X	X	X	X
Pyrus coronaria	wild crabapple	UPL	3	perennial		X	X	X	X
Rhamnus frangula	glossy buckthorn	FAC	*	perennial	X	X	X	X	X
Rorippa palustris	yellow-cress	OBL	2	annual			X	X	X
Rubus allegheniensis	common blackberry	FACU-	1	perennial	X	X	X	X	X
Rubus flagellaris	northern dewberry	FACU	1	perennial				X	X
Rudbeckia hirta	black-eyed Susan	FACU-	1	perennial			X	X	X
Rumex crispus	curly dock	FACU	*	perennial			X	X	X
Salix amygdaloides	peach-leaved willow	FACW	3	perennial			X	X	X
Salix discolor	pussy willow	FACW	3	perennial	X	X	X	X	X
Salix exigua	sandbar willow	OBL	1	perennial			X	X	X

Scientific Name[1]	Common Name[1]	Indicator Status[1]	C of C score[1]	Habit[1]	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
Salix sp.	willow	WIS	n/a	perennial	X	X	X	X	X
Schoenoplectus tabernaemontani	soft-stemmed bulrush	OBL	2	perennial			X	X	X
Scirpus atrovirens	green bulrush	OBL	1	perennial		X	X	X	X
Scirpus pendulus	drooping bulrush	OBL	2	perennial		X	X	X	X
Scirpus polyphyllus	leafy bulrush	OBL	6	perennial			X	X	X
Setaria faberi	giant foxtail grass	UPL	*	annual	X		X	X	X
Setaria glauca	yellow foxtail grass	FAC	*	annual		X	X	X	X
Sisyrinchium angustifolium	stout blue-eyed-grass	FACW-	2	perennial			X	X	X
Solanum carolinense	horse nettle	UPL	*	perennial				X	X
Solidago canadensis	Canada goldenrod	FACU	1	perennial	X	X	X	X	X
Solidago juncea	plume goldenrod	UPL	2	perennial		X	X	X	X
Solidago rugosa	rough goldenrod	FAC	2	perennial	X	X	X	X	X
Solidago sp.	goldenrod	n/a	n/a	perennial		X		X	X
Sparganium sp.	bur-reed sp.	n/a	n/a	perennial		X	X	X	X
Spiranthes sp.	ladies-tresses	n/a	n/a	perennial			X	X	X
Stuckenia pectinata	sago pondweed	OBL	2	perennial		X	X	X	X
Toxicodendron radicans	poison-ivy	FAC	1	perennial	X	X	X	X	X
Trifolium hybridum	alsike clover	FACU-	*	perennial		X	X	X	X
Trifolium pratense	red clover	FACU-	*	perennial		X	X	X	X
Trifolium repens	white clover	FACU-	*	perennial			X	X	X
Trifolium sp.	clover	n/a	n/a	n/a	X			X	X
Tussilago farfara	coltsfoot	FACU	*	perennial		X	X	X	X
Typha angustifolia	narrow-leaved cat-tail	OBL	*	perennial			X	X	X
Typha latifiolia	broad-leaved cat-tail	OBL	1	perennial	X	X	X	X	X
Ulmus americana	American elm	FACW-	2	perennial		X	X	X	X
Verbascum blattaria	moth mullein	UPL	*	biennial				X	X
Verbena hastata	blue vervain	FACW+	4	perennial	X	X	X	X	X
Viburnum recognitum	northern arrow-wood	FACW-	2	perennial	X	X	X	X	X
Vicia tetrasperma	lentil vetch	FAC	n/a	annual		X	X	X	X

[1] These data were obtained from Andreas, *et al.*, 2004. Non-native species are denoted with an asterisk in the Coefficient of Conservation (C of C) column and have no score.

Appendix I
ORAM Form for Mitigation Wetland

Background Information

Name:	Todd Crandall
Date:	August 1, 2011
Affiliation:	Davey Resource Group
Address:	3728 Fishcreek Road, Stow, Ohio 44224
Phone Number:	330-673-5685
E-Mail Address:	todd.crandall@davey.com
Name of Wetland: Route 80 Tank Farm Wetlands Mitigation Site	
Vegetation Communit(ies): Emergent	
HGM Class(es): Depression	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. See Mitigation Monitoring Report	
Lat/Long or UTM Coordinate:	41.2000, 81.1456
USGS Quad Name:	Ravenna
County:	Portage
Township:	Charlestown
Section and Subsection:	n/a
Hydrologic Unit Code:	05030103
Site Visit:	May 9 and August 1, 2011
National Wetland Inventory Map:	n/a
Ohio Wetland Inventory Map:	n/a
Soil Survey:	n/a
Delineation Report/Map:	See Mitigation Monitoring Report

Name of Wetland:	Route 80 Tank Farm Wetlands Mitigation Site
Wetland Size (acres, hectacres)	3.137 acres

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

See Mitigation Monitoring Report

Comments, Narrative Discussion, Justification of Category Changes:

Final Score: 41 **Category:** modified 2

Scoring Boundary Worksheet

INSTRUCTIONS: The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances, this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large continguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below; however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	Done?	Not Applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	x	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes, including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	x	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, *i.e.,* areas that have a high degree of hydrologic interaction are included within the scoring boundary.	x	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	x	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	x	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes, or rivers, or for dual classifications.		x

End of Scoring Boundary Determination.
Begin Narrative Rating On Next Page.

Narrative Rating

INSTRUCTIONS: Answer each of the following questions. Questions 1, 2, 3, and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www/dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Check One	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 Minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 2	☒ NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of, federal or state-listed threatened or endangered plant or animal species?	☐ YES Wetland is a Category 3 wetland. Go to Question 3	☒ NO Go to Question 3
3	**Documented High-Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high-quality wetland?	☐ YES Wetland is a Category 3 wetland. Go to Question 4	☒ NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	☐ YES Wetland is a Category 3 wetland. Go to Question 5	☒ NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than 80% areal cover) by *Phalaris arundinacea*, *Lythrum salicaria*, or *Phragmites australis;* or 2) an acidic pond created or excavated on mined lands that have little or no vegetation>	☐ YES Wetland is a Category 1 wetland. Go to Question 6	☒ NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows; 2) supports acidophilic mosses, particularly *Sphagnum* spp.; 3) the acidophilic mosses have >30% cover; 4) at least one species from Table 1 is present; and 5) the cover of invasive species (see Table 1) is <25%.	☐ YES Wetland is a Category 3 wetland. Go to Question 7	☒ NO Go to Question 7
7	**Ferns.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%.	☐ YES Wetland is a Category 3 wetland. Go to Question 8a	☒ NO Go to Question 8a

8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics; overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multi-layered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	☐ YES Wetland is a Category 3 wetland. Go to Question 8b	☒ NO Go to Question 8b
8b	**Mature forested wetlands.** Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	☒ NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	☐ YES Go to Question 9b	☒ NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, *i.e.,* the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, *i.e.,* the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	☐ YES Go to Question 9d	☐ NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance-tolerant native species can also be present.	☐ YES Wetland is a Category 3 wetland. Go to Question 10	☐ NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance-tolerant native plant species within its vegetation communities?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings).** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	☐ YES Wetland is a Category 3 wetland. Go to Question 11	☒ NO Go to Question 11
11	**Relict Wet Prairies.** Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (*e.g.,* Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (*e.g.,* Darke, Mercer, Miami, Montgomery, Van Wert, etc.)	☐ YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	☒ NO Complete Quantitative Rating

Table 1. Characteristic Plant Species

Invasive/Exotic Spp.	Fen Species	Bog Species	Oak Opening Species	Wet Prairie Species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis candensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis* spp.	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum* spp.		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating On Next Page.

Site:	Route 80 Road, Charlestown Township, Portage County, Ohio	**Date:**	August 1, 2011
Wetlands:	Route 80 Tank Farm Wetlands Mitigation Site	**Rater:**	Todd Crandall

Subtotal	Points
3	3

Metric 1. Wetland Area (size). (max 6 pts)

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [x] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

Subtotal	Points
15	12

Metric 2. Upland buffers and surrounding land use. (max 14 pts)

2a. Calculate average buffer width (select one, do not double check)

- [x] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use (select one or double check & average)

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Subtotal	Points
29.5	14.5

Metric 3. Hydrology. (max 30 pts)

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only 1.

- [x] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. (select one or double check & average)

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. (select one or double check & average)

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] dike
- [ ] tile
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [✓] filling/grading
- [✓] road bed/RR track
- [✓] dredging
- [ ] other- list

Subtotal	Points
37	7.5

Metric 4. Habitat Alteration and Development. (max 20 pts.)

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select one.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient emrichment

37 subtotal this page

Site:	Route 80 Road, Charlestown Township, Portage County, Ohio	**Date:**	August 1, 2011
Wetland:	Route 80 Tank Farm Wetlands Mitigation Site	**Rater:**	Todd Crandall

37 subtotal first page

37	0
Subtotal	Points

Metric 5. Special Wetlands. (max 10 pts.)

Check all that apply and score as indicated

	Bog (10 pts)
	Fen (10 pts)
	Old Growth Forest (10 pts)
	Mature forested wetland (5 pts)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10 pts)
	Lake Erie coastal/tributary wetland-restricted hydrology (5 pts)
	Lake Plain Sand Prairies (Oak Openings) (10 pts)
	Relict Wet Prairies (10 pts)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migatory songbird/waterfowl habitat or usage (10 pts)
	Category 1 Wetland. See Question 1 of Qualitative Rating. (-10 pts)

41	4
Subtotal	Points

Metric 6. Plant Communities, interspersion, microtopography. (max 20 pts.)

6a. Wetland Vegetation Communities

Score all present using 0 to 3 scale

	Aquatic bed
1	Emergent
	Shrub
	Forest
	Mudflats
1	Open water
	Other (list)

6b. Horizontal (plan view) interspersion

Select only one

	High (5)
	Moderately high (4)
	Moderate (3)
x	Moderately low (2)
	Low (1)
	None (0)

6c. Coverage of invasive plants.

Refer to Table 1 ORAM long form for list.

Add or deduct points for coverage

	Extensive >75 % cover (-5)
	Moderate 25-75% cover (-3)
x	Sparse 5-25% cover (-1)
	Nearly Absent <5% cover (0)
	Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale

	Vegetated hummocks/tussocks
	Coarse woody debris >15 cm (6")
	Standing dead > 25 cm (10") dbh
1	Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1 ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
moderate	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1 ha (0.2471 acres)
1	Low 0.1 ha to <1 ha (0.2471 acres to 2.47 acres)
2	Moderate 1 ha to <4 ha (2.47 acres 9.88 acres)
3	High 4 ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

41 **GRAND TOTAL (max 100 pts)**

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		Check Answer or Insert Score	Result
Narrative Rating	Question 1. Critical Habitat	☐ YES ☒ NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	☐ YES ☒ NO	If yes, Category 3.
	Question 3. High-Quality Natural Wetland	☐ YES ☒ NO	If yes, Category 3.
	Question 4. Significant Bird Habitat	☐ YES ☒ NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	☐ YES ☒ NO	If yes, Category 1.
	Question 6. Bogs	☐ YES ☒ NO	If yes, Category 3.
	Question 7. Fens	☐ YES ☒ NO	If yes, Category 3.
	Question 8a. Old Growth Forest	☐ YES ☒ NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	☐ YES ☒ NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands – Restricted	☐ YES ☒ NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands- Unrestricted with native plants	☐ YES ☒ NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands – Unrestricted with invasive plants	☐ YES ☒ NO	If yes, Category 3; may also be 1 or 2
	Question 10. Oak Openings	☐ YES ☒ NO	If yes, Category 3
	Question 11. Relict Wet Prairies	☐ YES ☒ NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	12	
	Metric 3. Hydrology	14.5	
	Metric 4. Habitat	7.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	4	
	TOTAL SCORE	41	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

Choices	Check One		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	☐ YES Wetland is categorized as a Category 3 wetland	☒ NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, re-evaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM.
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	☐ YES Wetland should be evaluated for possible Category 3 status	☒ NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	☐ YES Wetland is categorized as a Category 1 wetland	☒ NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, re-evaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM.
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	☒ YES Wetland is assigned to the appropriate category based on the scoring range	☐ NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances, however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "*gray zone*" for Category 1 or 2 or Category 2 or 3 wetlands?	☐ YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	☒ NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, *e.g.*, functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C)
Does the wetland otherwise exhibit *moderate* OR *superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	☐ YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	☒ NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, *e.g.,* a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose One	☐ Category 1	☒ Category 2	☐ Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Appendix J
VIBI Data

Focus Plot

Photograph 1 (8-1-11). The VIBI Focus Plot (looking north) is located in Wetland 6.

VIBI-E Metric Summary

VIBI-E Metrics	2007	2008	2009	2010	2011
Metric 1: *Carex* richness	0	0	3	7	3
Metric 2: Native dicot	0	3	0	7	7
Metric 3: Native wetland shrubs	0	0	0	3	3
Metric 4: Native hydrophytes	0	3	7	7	10
Metric 5: Annual/Perennial ratio	0	3	10	7	10
Metric 6: FQAI score	0	0	0	3	3
Metric 7: Percent tolerant	0	0	0	0	0
Metric 8: Percent sensitive	0	0	0	0	0
Metric 9: Percent invasive graminoids	0	7	0	0	0
Metric 10: Biomass	n/a	7	10	10	7
VIBI-E Score	**0**	**23**	**30**	**44**	**43**

Soil Characteristics

Soil Depth	2007	2008	2009	2010	2011
5 cm	Fill and disturbed soils	10 YR 5/2	10 YR 5/1 10 YR 5/6 mottle	10 YR 4/1 10 YR 5/3	10 YR10 YR 4/1 10 YR 5/3
20 cm	Fill and disturbed soils	10 YR 5/2	10 YR 5/1 10 YR 5/6 mottle	Gravel and rock	Gravel and rock

Water Level Summary

Module	2007	2008	2009	2010	2011
2	n/a	n/a	2 cm	1 cm	4cm
3	n/a	n/a	Saturated to surface	Saturated at 5 cm	saturated to surface
8	n/a	n/a	Saturated at 4 cm	Saturated to surface	saturated to surface
9	n/a	n/a	Saturated to surface	1 cm	2cm

Appendix K
Animal Species Found at Ravenna Training and Logistics Site (RTLS) Route 80, Tank Farm Wetlands Mitigation Site

Common Name	Scientific Name	2007 (Year One)	2008 (Year Two)	2009 (Year Three)	2010 (Year Four)	2011 (Year Five)
AMPHIBIANS						
American toad	*Bufo americana*		X	X	X	X
gray tree frog	*Hyla versicolor*			X	X	X
green frog	*Rana clamitans*	X	X	X	X	X
leopard frog	Rana pipiens				X	X
BIRDS						
American robin	*Turdus migratorius*		X	X	X	X
Baltimore oriole	*Icterus galbula*					X
barn swallow	*Hirundo rustica*				X	X
yellow warbler	*Dendroica petechia*					X
black-capped chickadee	*Poecille atricapillus*		X	X	X	
blue jay	*Cyanocitta cristata*			X	X	X
Canada goose	*Branta canadensis*	X	X	X	X	X
field sparrow	*Spizella pusilla*				X	
goldfinch	*Carduelis tristis*			X	X	X
gray catbird	*Dumetella carolinensis*		X	X	X	X
killdeer	*Charadrius vociferus*	X	X	X		X
northern cardinal	*Cardinalis cardinalis*		X	X	X	X
redwing blackbird	*Agelaius phoeniceus*				X	X
turkey vulture	*Cathartes aura*			X	X	X
American crow	*Corvus brachyrhynchos*					X
tufted titmouse	*Baeolophus bicolor*					X
wild turkey	*Meleagris gallopavo*	X				
MAMMALS						
common raccoon	*Procyon lotor*	X	X	X	X	X
eastern cottontail	*Sylvilagus floridanus*			X		
ground hog	*Marmota monax*				X	X
white tail deer	*Odocoileus virginiana*	X	X	X	X	X

Appendix L
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Appendix M
Resumes of Professional Staff

Shawn W. Bruzda is a senior urban forester, biologist, and technical specialist with Davey Resource Group, having served in this capacity for over 10 years. Mr. Bruzda performs tree inventories for cemeteries, developments, golf courses, military bases, municipalities, museums, parks, university and corporate campuses, and zoological parks. Through these inventory projects, he has acquired extensive knowledge of tree risk assessment and has acquired expert tree identification skills, specializing in deciduous and coniferous trees and palms of the Southern United States. Mr. Bruzda is also responsible for the creation and dissemination of tree inventory management plans, as well as reports dealing with various applied urban forestry topics. Accordingly, he has developed a thorough understanding of the role tree inventories play in urban forest management. He has extensive experience with handheld and pen tablet GIS and GPS data collection units and their respective software applications. He has served as project manager on numerous large- and small-scale municipal tree inventories throughout the United States. He has also participated in the collection of data for i-Tree Streets. i-Tree Streets, developed by the U.S. Forest Service, is a model used for analyzing the benefits of urban street trees as well as the costs of managing them. Mr. Bruzda also assists with tree preservation and planting plans, as well as tree appraisals and soil analyses. As a biologist with Davey Resource Group, Mr. Bruzda focuses on ecological surveys involving fish and macroinvertebrate identification and data analysis. He is proficient with the Index of Biotic Integrity (IBI), the Modified Index of Well-Being (MIWB), and the Invertebrate Community Index (ICI), all used by Ohio Environmental Protection Agency to set minimum criteria index scores for use designations in water quality standards. He works on large- and small-scale bat survey projects, assisting with mist-net surveys, habitat evaluations, and radio tracking studies to determine foraging patterns; endangered species and habitat studies; invasive species management; secondary source reviews; technical report writing; and water quality studies. Mr. Bruzda has completed training through Ohio Environmental Protection Agency for conducting the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). Proficient with AutoCAD® and ArcGIS™ software, Mr. Bruzda creates maps for a wide variety of natural resource and tree-related projects. Mr. Bruzda is also responsible for safety and fleet vehicle management. He is an International Society of Arboriculture (ISA) Certified Arborist (OH-1342A). Mr. Bruzda is a graduate of Kent State University, having received a Bachelor of Science degree in biological sciences with an emphasis in aquatic ecology.

Ken Christensen is a senior biologist with more than 25 years of experience in the natural resource field. Mr. Christensen is involved in all aspects of wetlands and stream restoration projects, including design, planting, and implementation. He is also involved with the subsequent monitoring of mitigation and restoration projects to ensure that such endeavors reach an expected successful conclusion. Mr. Christensen assists in plant surveys and wetlands delineations and in the field identification of vertebrate populations, especially amphibians, reptiles, and mammals. Proficient with AutoCAD® software, Mr. Christensen is responsible for managing the Global Positioning System (GPS) data collection and AutoCAD® mapping operations for all natural resource studies. As an International Society of Arboriculture Certified Arborist (OH-0690A), he performs tree appraisals and inventories and also develops tree preservation plans. Mr. Christensen is a LEED® Accredited Professional and has received the following training: Certificate of Completion for LEED® for New Construction Technical Review Workshop from U.S. Green Building Council; Certificate of Completion for American Ecological Engineering Society Wetland Mitigation Design from Virginia Polytechnic Institute and State University; Certificate of Completion for AutoCAD® for Stream Restoration and Monitoring from North Carolina Cooperative Extension; Certificate of Completion from North Carolina Stream Restoration Institute's Stream Classification and Assessment Program; and Certificate of Completion from North Carolina Stream Restoration Institute's Stream Restoration Design Principles. Mr. Christensen is prequalified by the Ohio Department of Transportation for wetland mitigation. He has also completed training through Ohio Environmental Protection Agency for conducting the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index

(QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). Clients for these mitigation, stream restoration, and tree preservation projects have included the Holden Arboretum, Ohio Wetlands Foundation, Medina County Park District, Metro Parks Serving Summit County, Portage Park District, and Western Reserve Land Conservancy. He is a member of the American Ecological Engineering Society, Breakneck Creek Watershed Coalition, the Ecological Landscaping Association, the Northeast Ohio Association of Herpetologists, American Ecological Engineering Society, and Association of State Wetlands Managers. Mr. Christensen holds a Bachelor of Science degree in conservation from Kent State University.

Todd A. Crandall, M.En., is a senior wetlands scientist with 19 years of experience performing wetlands delineations in Ohio and adjacent states. Mr. Crandall also performs ecological surveys, vegetation cover mapping, plant identification, and Section 401 and 404 and isolated wetlands permitting. He also contributes to the planning and design of restoration wetlands and prepares wetland mitigation reports. Mr. Crandall is responsible for vegetation monitoring at numerous wetlands mitigation sites throughout Ohio. He has completed large-scale wetlands and natural resource inventories for the Cuyahoga Valley National Park, as well as Cuyahoga, Medina, Portage, and Summit Counties in Northeast Ohio. He is certified to perform wetlands studies by the U.S. Army Wetlands Delineator Certification Program, and is a certified Professional Wetland Scientist through the Society of Wetland Scientists. He has completed the 40-hour OSHA health and safety training (OSHA Standard 29 CFR 1910.120). Mr. Crandall has successfully completed the Ohio Department of Transportation's (ODOT) Ecological Training hosted by the Office of Environmental Services. He is ODOT prequalified for ecological surveys and wetland mitigation. Mr. Crandall has also completed training through the Ohio Environmental Protection Agency for the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). He holds a Bachelor of Science degree from Hiram College in biology and a Master's degree in environmental science from Miami University.

Jessica Hickey, M.S., is a biologist and project manager with over 9 years of experience in wetland delineation and mitigation; Section 401 and 404 permitting; stream and wetland restoration; aquatic and terrestrial surveys, including bat mist-net, habitat, and emergence studies; Phase I Environmental Site Assessments; and water quality testing. She currently assists in the coordination of wetland mitigation monitoring projects for Davey Resource Group. Ms. Hickey specializes in the federally endangered Indiana bat (Myotis sodalis) and performs mist-net surveys, habitat evaluations, and radio tracking studies to determine foraging patterns. She has prepared a Biological Assessment report for U.S. Fish and Wildlife Service assessing potential impacts to the federally endangered Indiana bat on proposed development sites. She also completes aquatic habitat studies, including fish, macroinvertebrate, and amphibian surveys. Ms. Hickey has successfully completed the Ohio Department of Transportation's (ODOT) Ecological and Waterway Permits Training hosted by the Office of Environmental Services. She is ODOT prequalified for ecological surveys, wetland mitigation, and waterway permits. Ms. Hickey has provided planting and construction oversight for numerous wetland and stream restoration projects and has managed large-scale projects with multiple subcontractors and team members, including the Shadybrook Stream Restoration Project for Holden Arboretum and the Mud Brook Wetlands Mitigation Project for the City of Stow. Ms. Hickey has completed training through Ohio Environmental Protection Agency for the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). She has also completed a Geomorphology and Ecology of Stream Systems course, Bat Conservation International Bat Management training, ANABAT workshop training, and ASTM Phase I Environmental Site Assessment training. Ms. Hickey graduated from the University of Toledo with a Bachelor of Science degree in environmental science with an emphasis in biology, and holds a Master of Science degree in biology from John Carroll University.