

**Plan for the Proposed  
North Coast Regional Council of Park Districts  
Harris Road Wetland Mitigation Bank  
Lorain County, Ohio  
Department of Army Permit No. 2011-00772**

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## 1.0 Introduction

The North Coast Regional Council of Park District's (NCRCPD) Harris Road mitigation bank site is located south of Sheffield Lake in Sheffield Township, west of Harris Road at Oster Road and north of the Norfolk-Western Railroad, Lorain County, Ohio (Figures 1 and 3). The Harris Road site is owned by the Lorain County Metropolitan Park District (LCMP), comprises approximately 77 acres, with approximately 29.3 acres of wetland reestablishment and 28 acres of wetland rehabilitation proposed for the site.

The North Coast Regional Council of Park District's (NCRCPD or North Coast) mitigation bank currently comprises seven active, two pending and four sold-out mitigation banking sites. The NCRCPD's proposed Harris Road Wetland Mitigation Bank site will be the fourteenth mitigation banking site developed and operated by North Coast, a public regional council organized under Chapter 167 of the Ohio Revised Code. The Ohio metropolitan park districts constituting North Coast are: Erie MetroParks, Lorain County Metropolitan Park District, Medina County Park District, Sandusky County Park District and Wood County Park District. The mitigation bank was authorized and established on December 27, 2001, and new mitigation banking sites have been added in accordance with the regional mitigation bank plan (NCRCPD, 1999) and the mitigation banking instrument. By integrating the restored wetlands into a member park district's park system, the restored wetlands provide valuable educational and recreational benefits to the community. These public benefits are defined as *Services* in the *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (33 CFR Part 332), referred to as the Federal Compensatory Mitigation Rule. Select definitions follow:

*Services* mean the benefits that human populations receive from functions that occur in ecosystems.

*Sponsor* means any public or private entity responsible for establishing, and in most circumstances, operating a mitigation bank or in-lieu fee program.

All of the definitions in the Federal Compensatory Mitigation Rule (§332.2), the Ohio isolated wetland law and Ohio wetland water quality standards, as amended, are incorporated by reference in this Plan for the proposed Harris Road Wetland Mitigation Bank.

The Federal Compensatory Mitigation Rule was developed jointly by the US Army Corps of Engineers (COE or District Engineer) and the US Environmental Protection Agency (USEPA) in 2008 to clarify

compensatory mitigation requirements (§332.1). North Coast, a mitigation bank *Sponsor*, submitted the Plan for the Harris Road Wetland Mitigation Bank on April 5, 2012 as a modification to its 2001 mitigation banking instrument and members of the IRT conducted a site inspection on July 27, 2012 . At the suggestion of the Buffalo Corps District, a new standalone mitigation banking instrument and revised Harris Road Wetland Mitigation Bank Plan would be preferable to a modification of the 2001 instrument for any new sites (Personal Communication, 2012).

The Harris Road Wetland Mitigation Bank site is located less than one mile from Lake Erie in the Black/Rocky River USGS Hydrologic Unit Code (HUC) #04110001 (Figure 2; USGS, 1988). The geographic service area includes the entire HUC #04110001 (Black/Rocky River) in which the mitigation banking site is located. The Harris Road Wetland Mitigation Bank service area is consistent with the Federal Compensatory Mitigation Rule, Ohio's wetland water quality rules and provisions on service areas; and is appropriately sized to compensate for wetland impacts within the watershed.

In accordance with regulatory (IRT) guidelines and state laws and rules, compensatory mitigation for impacts to Category 1 wetlands and for impacts to 0.5 acres or less of Category 2 isolated wetlands may be located at any mitigation bank within the Ohio portion of the regulatory boundaries of the Buffalo Corps District.

Locating compensatory mitigation for unavoidable wetland impacts at the Harris Road Wetland Mitigation Bank site is subject to project specific regulatory approval by the US Army Corps of Engineers under the Federal Compensatory Mitigation Rule and/or the Director of the Ohio Environmental Protection Agency (OEPA) under Chapter 6111 of the Ohio Revised Code. The Corps of Engineers and/or the OEPA will consider, on a project specific basis, the use of the Harris Road Wetland Mitigation Bank as compensatory mitigation for unavoidable wetland impacts outside of the identified geographic service area. A sample mitigation agreement for use by permit applicants is found in Appendix H.

A secondary service area includes the remainder of the 6-digit HUC watershed in which the primary service area occurs (041100, Southern Lake Erie). Use of a secondary service area for compensatory mitigation may be approved by the regulatory agencies on a project specific basis, if such mitigation is consistent with the considerations set forth in §332.3(b) of the Federal Compensatory Mitigation Rule including the watershed approach and, if applicable, state laws and rules. The remainder of the 8-digit

HUCs within the proposed secondary service area have had significant cumulative wetland impacts, in excess of 260 acres (OEPA, 2004-2013), but have limited options for wetland mitigation credits.

## **2.0 Objectives**

The primary objective of the Harris Road Wetland Mitigation Bank is to reestablish and rehabilitate wetlands as compensatory mitigation under Sections 401 and 404 of the Clean Water Act and the State of Ohio's isolated wetland statute, and to incorporate the restored wetlands into the county park system operated by Lorain County Metropolitan Park District. Compensatory wetland mitigation at the site will include wetland reestablishment and rehabilitation, with reestablishment of approximately 29.3 acres of the site located in existing non-wetland forest, shrub and herbaceous fields. Wetland rehabilitation will include approximately 28 acres of the existing forested wetlands (See Appendices A & B and Table 1). Restoration and rehabilitation of this site will support the mission of the park district, "to preserve and create a diversity of ecosystems while providing educational and recreational opportunities which are compatible with and promote conservation of these resources;" and the objectives of the NCRCPD, which include restoration and enhancement of wetlands that subsequently can be integrated into a county park system providing benefits and services for the entire community.

Additionally, wetland reestablishment and rehabilitation of this parcel will address one of the beneficial use impairments noted in the 2008 TMDL report for the Black River Watershed – loss of wildlife habitat. Restoration of wetlands in each subwatershed of the Black River will contribute to achieving the current delisting milestone for impaired wildlife habitat in the Black River Area of Concern which requires that "more than 10% of the major watershed and more than 6% of the subwatershed is high quality wetland habitat" (Ohio EPA, 2008, page 53). The referenced OEPA delisting guidance recommends protection of "unimpacted habitat areas followed by restoration or rehabilitation of degraded habitat areas." If the delisting targets and milestones for the Black River AOC are not revised, the Black River RAP Coordinating Committee estimates in the draft Black River RAP Stage 2 Report that a staggering  $\pm 9,700$  additional acres of restored wetlands are needed to attain the wetland cover milestones in the Black River (OEPA, 2010; page 14).

The terms used to describe the methods of compensatory mitigation (restoration, reestablishment, rehabilitation) are defined in §332.2 of the Federal Compensatory Mitigation Rule:

*Restoration* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: reestablishment and rehabilitation.

*Reestablishment* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Reestablishment results in rebuilding a former aquatic resource and results in a gain of aquatic resource area and functions.

*Rehabilitation* means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area. [Note that the definition of enhancement in Ohio Administrative Code 3745-1-50 corresponds to the federal rule definition of rehabilitation.]

### **3.0 Site Selection Criteria**

The Harris Road site was acquired by LCMP in 2009 for conservation of a parcel in a developing community, for natural resource preservation and restoration, and for development of a passive recreational park. The ±77 acre parcel was evaluated for wetland restoration and rehabilitation potential which included office research and field evaluations regarding potential restoration attributes such as landscape position, hydrology, soils, existing vegetation communities, wildlife and potential education and recreation opportunities, and consideration of watershed level ecologically significant aquatic resources.

The parcel is located in the headwater of Day Ditch, a Lake Erie tributary located in USGS HUC #04110001, part of the Black River subbasin. The site is less than 1 mile from Lake Erie and adjacent to the straightened ditch. This mitigation site would be North Coast's second site in the Lake Plain zone which is about 10 miles wide in this area (average of 5 to 6 miles wide along Lake Erie). The site is mostly forested upland and wetland and part of the Day Ditch drainage system, which extends downstream through Sheffield and the surrounding residential area. The Day Ditch catchment above the Harris Road site comprises mostly agricultural land and patches of forest.

The parcel is situated on two topographically flat Lake Plain levels with existing forested wetlands located in Depression and Flats HGM landscapes. Both levels have moderately to highly modified drainage patterns comprising shallow ditches and ridge and furrow surface water drainage that promotes relatively rapid runoff from the site. The current HGM landscape lacks significant 'natural buffer' functionality compared to undisturbed sites in the same HGM landscape. All soils are Epiaqualfs and associated with perched water tables. Lorain SCL soil on the lower Lake Plain is the only soil associated with a seasonal apparent water table, which may rise to <1 ft. of the surface. Surface water hydrology

within the site is influenced by perimeter ditches draining to the southwest corner of the site where flooding may occur.

Restoration will add forested wetland rehabilitation, new forested wetland, emergent wetland habitats and a range of hydrology zones, potentially important habitat for wildlife (mammals, birds, amphibians, reptiles, insects/invertebrates) and potential feeding, breeding, nesting and rearing habitats, as well as migratory pathways with adjacent connections within the Lake Plain zone, which extends approximately 10 miles inland in this region. Additionally, the Harris Road site is located along the northern perimeter of a rather large aerial 'green' zone extending to French Creek and south along the Black River corridor (Exhibit 1 to the Plan dated 2/20/2012).

In addition to assessing the Harris Road site's suitability for restoration, the site was also evaluated based on other criteria, including its potential to be ecologically successful, stable and sustainable with limited maintenance, whether invasive species on the site can be managed, whether the site maximizes opportunities to contribute to biodiversity and multiple watershed functions by restoring/rehabilitating habitat complexes and a range of hydroperiods, and whether the site has the potential to provide or connect to important habitat corridors or migratory pathways for mammals, birds, amphibians, reptiles, insects/invertebrates.

Other criteria considered include whether the site supports park or other conservation resource management plans or TMDL actions or recommendations, whether it is located in a watershed that has had significant cumulative wetland impacts, whether the site could offer recreational uses, educational uses or linkages to park facilities, trails, bike trails, green areas/zones or habitat patches in the community, and whether the potential mitigation project provides an opportunity to restore aquatic resources in a different ecoregion or of a differing type or on an appropriate undeveloped site in the midst of development.

#### **4.0 Baseline Information**

The Harris Road Wetland Mitigation Bank site is located within undeveloped parkland known as Sheffield Lake Reservation, south of Sheffield Lake in Sheffield Township, west of Harris Road at Oster Road and north of the Norfolk-Western Railroad. General site photographs are found in Exhibits 2-8 to the Plan dated 2/20/2012 and site location maps are found in Figures 1 and 3.

#### **Soils**

The soils at the site include Haskins (HsA) loam, Lorain (Ln) silty clay loam, Mahoning (MgA) silt loam and Miner (Mr) silty clay loam (Figure 4). All of these soils are in the taxonomic subgroup Epiaqualfs of

the Alfisol order, with Haskins and Mahoning classified as somewhat poorly drained Aeric Epiaqualfs and Lorain and Miner as poorly drained Mollic Epiaqualfs. Epiaqualfs are associated with perched water tables located in the upper soil column above an aquatard. Lorain soils may also be associated with a seasonal apparent water table less than 1 ft. below ground level. The Natural Resources Conservation Service (NRCS) classifies Lorain and Miner silty clay loams as hydric and the remaining soils as partially hydric (USDA-NRCS, 2012).

Existing wetlands occur primarily in Lorain and Miner soils on the lake plain (the northwest part of the site) and within Miner soil and areas with hydric soil inclusions in areas mapped as Mahoning and Haskins on the slightly elevated terrace (the southeast part of the site). On the flat terrace existing wetland development is associated with shallow linear drainages and flat depressional areas which reflect the poor drainage characteristics associated with the soils and overall site. The National Wetland Inventory (NWI) map (Figure 5) did not show any wetlands at the site.

### **Hydrology**

The Harris Road mitigation bank site is located in the Black River basin and within the area categorized under USGS HUC #04110001 (Figure 2). The entire parcel drains to Day Ditch, a relatively short Lake Erie tributary within the HUC #04110001 watershed. Farming in all but the wettest area of the parcel was apparently made possible using a shallow manmade ditch network that funneled surface water via several trunk lines from the slightly higher terrace located along the south part of the site above about 610 ft., down slope to the lower lake plain area, generally below an elevation of  $\pm 609$  ft. Surplus surface water entering the low lake plain accumulates in the trunk line ditches, shallow furrows and adjacent depressions near the northwest boundary of the site before dissipating fairly quickly via several eroded rills and seep areas into the nearby north tributary to Day Ditch. All of the delineated wetlands are connected to, immediately adjacent to, or occur within one or more of the shallow drainage ditches that drain surface water from the site. Surface water may enter the parcel during spring runoff and storm events from a south tributary of Day Ditch at several locations along Idlewood Drive and the railroad ditch located along the south boundary of the site. 100 year floods may also enter the site from the southwest corner of the site (Figure 6). The COE determined that all of the wetlands were part of a jurisdictional surface water tributary system (Appendix B). A summary of the existing wetlands is found in the table below.

**Table 1: Existing Wetlands**

<b>Wetland</b>	<b>Acres</b>	<b>Cowardin Classification</b>
W#1	0.03	PSS
W#2	0.01	PFO
W#3	0.04	PFO
W#4*	1.39	PFO, PEM
W#5*	0.47	PFO
W#6*	1.47	PFO
W#7*	0.60	PFO
W#8*	0.56	PFO
W#9*	25.15	PFO, PSS
W#10	0.12	PEM
Total Wetlands=	29.84	

\* Wetland proposed for rehabilitation

**Topography**

The ±77 acre parcel is located approximately 4100 ft. south of Lake Erie on an ancient lake plain landscape. Topographically, the site is bisected NE to SW by contours depicting an ancient shoreline formation with a lower 'lake plain' terrace and an upper inland terrace (Figure 3). The more recent land use included a small farm with several agricultural fields surrounded by old fence rows, tree lines and woodlots, including a number of seasonal wetlands. Maximum ground elevations reach approximately 614 ft. to 616 ft. in the southeast part of the site and fall slightly across the upper terrace to a shoreline slope, from about 611 ft. to 609 ft., to a lower terrace (the most recent lake plain) located below approximately 609 ft. The slope between the upper terrace and the more recent lake plain is very gradual and both the inland terrace and lake plain are nearly flat. The overall site comprises a network of shallow agricultural furrows/ditches that drain surface water from the site. A relatively small area of fill (±4.5 acres) stands about 3.5 ft. to 4 ft. above ground level in the southwest part of the site.

**Land Use and Description**

Prior to LCMP's ownership of this parcel in 2009 small portions of the site were in agriculture through approximately the 1990s while the remaining parts were allowed to revert along old tree lines and woodlots to second growth forest, including wetlands. Land use southward of the Norfolk-Western Railroad is largely agricultural and large woodland tracts that reach about 1.6 miles to the Black River. The residential community of Sheffield Lake borders the site northward, east along Harris Road and west along Idlewood Drive.

## 5.0 Mitigation Credits

Wetland credits are determined by the COE in consultation with the IRT in accordance with §332.8(o) of the Federal Compensatory Mitigation Rule. For wetlands, whole or partial acres are the unit of measure used to determine credits, with one credit equivalent to one acre of reestablished wetland and one credit equivalent to two acres of rehabilitated wetland. In accordance with §332.8(o), the number of credits must reflect the difference between pre- and post-compensatory mitigation project site conditions, as determined by a functional or condition assessment or other suitable metric. As indicated in Table 2 below, ±29.3 wetland credits are anticipated to be generated by reestablishment of wetlands and ±14 wetland credits are anticipated to be generated by rehabilitation of existing wetland habitats.

**Table 2: Summary of Credits**

<b>Type of Credit</b>	<b>Estimated Acres</b>	<b>Credit Ratio</b>	<b>Estimated Number of Credits</b>
Emergent			
Reestablishment	7.1 acres	1:1	7.1
Forest			
Reestablishment	22.2 acres	1:1	22.2
Forest Rehabilitation	28 acres	1:2	14

The reestablishment credit ratio of 1:1 is based on the reestablishment of wetlands in nonwetland areas in hydric/functional hydric soils with minimal site alteration and appropriate siting to promote diverse wetland functions and ensure long-term sustainability.

The rehabilitation credit ratio of 1:2 is based on the rehabilitation of existing degraded forested wetlands with permanent improvements to the wetland functions, including hydrological functions and ecological condition (IBI score).

Interim and final quantification of wetland acres/credits will be based on comprehensive wetland delineations determined under the COE’s 1987 Wetland Delineation Manual and Regional Supplements, submitted with or prior to credit release requests, and an assessment whether the acres/credits under review meet performance standards.

Mitigation ratios for entities that propose to use the Harris Road Wetland Mitigation Bank will be determined by the COE and/or OEPA on a project specific basis; ratios are expected to range from 1:1 to 3:1, depending on factors including the location, resource class/category and assessment of impacted wetlands. As provided by §332.3(f)(2), the COE “must require a mitigation ratio greater than 1:1 where necessary to account for the method of compensatory mitigation (e.g., preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the

difficulty of restoring or establishing the desired aquatic resource type and functions and/or the distance between the affected aquatic resource and the compensation site.”

### **Credit Releases**

Releases of wetland credits are based on the achievement of specific milestones as determined by the COE in consultation with the IRT in accordance with §332.8(d)(6)(iii)(B) of the Federal Compensatory Mitigation Rule. The proposed credit release schedule for the Harris Road Wetland Mitigation bank is set forth below.

Thirty percent (30%) of the anticipated reestablishment credits for this site (8.8 credits) will be available for sale upon approval of the Mitigation Banking Instrument (MBI) for the Harris Road Wetland Mitigation Bank site and recording of the site protection instrument (Appendix E). As indicated in the MBI, implementation of this Revised Plan must be initiated within one full growing season from the date of the sale of the first credit.

Up to 45% (75% cumulative) of the reestablishment credits (13.2 credits) will be released (1) after the initial 8.8 credits meet the criteria for wetlands determined pursuant to the Corps’ Delineation Manual and Supplements (vegetative, hydrology and hydric/functional hydric soils requirements) and are on a trajectory to meet performance standards within the monitoring period; and (2) the additional reestablishment areas under review for release meet the criteria for wetlands, as indicated above, and demonstrate to the satisfaction of the COE, in consultation with the IRT, that said areas meet performance standards or are on a trajectory to meet the performance standards within the monitoring period.

A minimum of twenty-five percent (25%) of the anticipated reestablishment credits for this site (7.3 credits) will be held back until all performance standards are achieved.

The rehabilitation credits for this site (14 credits) will be available for sale when the existing forested wetlands attain a vegetation IBI score of at least 61, or attain a net increase of 10 points over the baseline vegetation IBI score, whichever is higher, and meet all the other performance standards for the rehabilitated wetlands. Whole credits for wetland reestablishment adjacent to Harris Road (within 50 meters) may be reduced by the IRT to half or quarter credits “depending on the level of risk associated with the intensity of current and reasonably foreseeable future land uses on adjacent properties” (Ohio IRT, 2011).

The documentation to be provided to the COE and other members of the IRT with the request to release additional credits will include a comprehensive wetland delineation determined under the COE's 1987 Wetland Delineation Manual and Regional Supplements and data from randomly selected, targeted and focus plot vegetation sampling. Appropriate tables summarizing vegetation IBI scores, percent relative cover of native perennial hydrophytes, percent relative cover of invasive species (Ohio Guidelines, Appendix 7), appropriate woody stem data (generated from VIBI data), and comparisons of plot data to select performance standards or comparisons of plot data over time will be included.

The COE, in consultation with the IRT, may modify the credit release schedule, including reducing the number of available credits or suspending credits sales or transfers altogether, where necessary to ensure that all credit sales or transfers remain tied to compensatory mitigation projects with a high likelihood of meeting performance standards (§332.8(d)(6)(iii)(B)).

## **6.0 Mitigation Work Plan**

The objective of the wetland restoration plan is to reestablish approximately 22 acres of palustrine forested wetlands, approximately 7 acres of palustrine emergent wetlands and to rehabilitate approximately 28 acres of palustrine forested wetlands (The specifications, construction drawings and details and planting and seeding lists are found in Appendix F and a map of the mitigation habitats is found in Appendix G). Forested and emergent wetland restoration will occur in areas that have been determined to be nonwetland, or generally the south part of the site bisected SW to NE. The forested wetland rehabilitation will encompass most of the existing forested wetland (wetland #9) located on the lake plain as well as existing forested wetlands #4, #5, #6, #7 and #8 located on the upper terrace (Appendix A).

Rehabilitation of the existing forested wetland on the lower lake plain terrace will include improving the hydrology, seeding and planting the herbaceous and shrub/sapling layers, selective tree culling/cutting, creating vernal pools and invasive shrub/sapling treatments. The proposed seed matrix and woody plantings for the overall site are included in the mitigation work plan (Appendix F). Shrub/sapling treatments will focus on non-native *Lonicera* spp. (honeysuckles), *Rosa multiflora* (multiflora rose) and *Rhamnus frangula* (glossy buckthorn). Selective culling and/or cutting will include only *Acer rubrum* (red maple), *Fraxinus pennsylvanica* (green ash) and *Ulmus rubra* (red elm) saplings and/or trees in size classes up to the maximum pole timber diameter at breast height. Seeding and plantings in these areas will include a variety of forested wetland herbaceous, shrub and tree species and the overall process will

improve corresponding forested wetland vegetation IBI measures while maintaining the integrity of the mature tree layer.

Improving the hydrology in the rehabilitation area will be accomplished by blocking selected interior drainage furrows to improve surface water distribution and plugging numerous eroded rills and furrows that currently drain surface water from the wetland along the north boundary that were created following improvements to the Day ditch tributary and right of way. Excavated soils from the constructed vernal pools will be used to block selected wetland interior furrows. Control structures installed at selected locations will be used to establish a long term passive hydrology regime equivalent to Zones III and IV (Table 5, COE, 1987) to maintain the existing tree layer and improve the quality of the shrub-sapling and herbaceous layers. Berm height and placement on the north side of the wetland will expand hydrology along existing topographic gradients into drier areas and into numerous north-south furrows/ditches and scattered shallow depressions on slightly higher ground within the wetland. Although variation in the hydrology is expected from year to year, on the average, inundation would occur about 25% and saturation up to 75% of the growing season, with both having greater overall areal cover. Hydrology will be provided by precipitation and overland flow including occasional inputs from Day Ditch tributary. Natural drydown will occur during the growing season in most years.

Forested wetland reestablishment in the upper terrace area is designed to establish dry-end hydroperiod zone III and hydroperiod zone IV (Table 5, COE, 1987) with emphasis on improving aquic conditions and saturated soils associated with the epiaqualfs and short periods of inundation adequate for successful wetland forest development on flats. Constructing low berms will improve surface water storage and provide soil water 'buffering' over time and space. The hydrology is intended to fall within a range adequate for developing additional forested wetlands and rehabilitating some of the existing forested wetlands without changing the integrity of the tree layer. Berm heights and placement will improve hydrology along existing topographic gradients including numerous transitions across parts of the existing network of agricultural furrows, natural drainageways and shallow depressions. The improved hydrology also will restore a number of potential vernal pools. Reestablishment measures will include seeding and/or plantings in the herbaceous and shrub-sapling layers (Appendix F).

Restoration will substantially improve surface water and groundwater hydrology buffering by utilizing the referenced methods to promote more natural surface water and groundwater patterns similar to other wetlands in similar, undisturbed landscapes. Improving the hydrologic buffering capacity will be accomplished using low berms constructed along the appropriate land contours, blocking manmade

drainage furrows, destroying tile and creating shallow wetland pools to improve functional attributes associated with increasing water storage and retention above ground and in the soils, better surface water dispersal and recharging water tables.

The berm layout is intended to promote long term, passive hydrology for stable wetland development and includes a number of control structures for managing wetland development. Plugging or blocking selected furrows and/or shallow drainages will minimize surface water losses from the upper terrace area and will improve soil moisture regimes appropriate for new wetland forest development and rehabilitation of some of the existing forested wetland areas. Surface water from the watershed, including overland flow and direct precipitation will provide the hydrology with wetland vegetation developing along the newly established gradients. Selective area seeding and/or plantings of native herbaceous and shrubby species will be performed in the forested areas as well as treatment for non-native *Lonicera* spp., *Rosa multiflora*, and *Rhamnus frangula*.

Emergent wetland hydrology on the terrace will be established in selected nonforested areas and in association with shallow inundation behind berms. Hydrology development for emergent wetlands will include several shallow scraped/excavated depressions and adjacent areas connected by the abandoned agricultural furrows/ditches and areas that merge with nearby natural swales. Emergent wetland hydrology will include mostly seasonally to semipermanently saturated soils and/or inundated areas with natural seasonal drydown occurring during the driest years. The expected overall range for emergent wetland hydrology is from hydroperiod zone II to III. Small areas of submerged and floating leaved vegetation will occur among the emergent wetlands. Emergent wetland areas will be seeded with native herbaceous, mixed herbaceous-woody and/or planted with native species (Appendix F). Treatment to eradicate non-native herbaceous and woody species listed for the site will also be performed in these areas, if necessary. The remaining areas of the site will include upland buffers and park facilities.

Initially, the primary input of available nutrients will be from residuals in the soil, especially the new emergent wetland areas located on the upper terrace. As the wetland communities develop, nutrients will be generated from the decomposing vegetation and organic materials that will accumulate from the vegetation.

The wetlands reestablished and rehabilitated at the site will include category 2 and 3 forested and emergent wetland habitats (OEPA, 2005). According to the classification system described by Cowardin et al (1979), the restored wetland habitats will be a part of the *Palustrine* ecological system and include

PEM (Palustrine Emergent Herbaceous with persistent and non-persistent subclasses) and PFO (Palustrine Forested Wetlands). Transitional PSS (Palustrine Scrub-Shrub) also will likely develop in certain areas as the site develops.

## **7.0 Performance Standards**

The goals for the Harris Road Wetland Mitigation Bank site are to rehabilitate forested wetland and reestablish forested and emergent wetland communities generally meeting the acreage description set forth above. The reestablished and rehabilitated wetland communities will be assessed using the standard protocols in the *Standardized Vegetation Sampling Procedures, Field Manual for Wetland Bioassessment*, v. 1.4 (or successor manuals), Ohio EPA Technical Report WET/2007-6 (the *Field Manual*) and achieve Category 2 to Category 3 vegetation IBI (VIBI) scores by the end of the monitoring period. The performance standards are set forth below:

1. The reestablished wetlands will generally meet the acreage description set forth above, and will meet the vegetative, hydrology and hydric/functional hydric soils requirements specified in the 1987 Corps of Engineers Wetland Delineation Manual (COE, 1987) and Supplements.
2. The reestablished and rehabilitated wetlands will contain a minimum of 75% relative coverage by facultative (FAC), facultative wetland (FACW) and obligate wetland (OBL) native perennial plant and tree species (Lichvar, 2013, 2014), commonly referred to as The National Wetland Plant List.
3. The reestablished and rehabilitated wetlands will contain less than 5% relative coverage of the invasive plant species identified in Appendix 7 of the Ohio Guidelines. If *Typha* species account for more than 5% relative cover, then the total of invasive species plus *Typha* species must be less than 10% total relative cover.
4. The reestablished wetlands will achieve Category 2 or 3 vegetation IBI scores for forested depressional wetlands in the Erie Ontario Drift and Lake Plain (EOLP) ecoregion. The reestablished emergent wetlands will achieve Category 2 or 3 vegetation IBI scores for depressional emergent or forested wetlands in the EOLP. The rehabilitated wetlands will achieve Category 2 or 3 vegetation IBI scores for depressional forested wetlands in the EOLP, or attain a net increase of 10 points over the baseline vegetation IBI score, whichever is higher. Baseline vegetation IBI scores determined in 2010 for two forested aggregates were 39 (plots 1, 2, 3, 5) and 29 (plots 4, 6, 7, 8, 9). (See Appendix I.)

Plant community scoring ranges for the Depression HGM class within the Erie Ontario Drift and Lake Plain (EOLP) are set forth below:

<b>Hydrogeomorphic Class (HGM)</b>	<b>Plant community</b>	<b>Category 2</b>	<b>Category 3</b>
Depression	Swamp forests, Marsh, Shrub swamp	61-75	76-100
Depression	Wet Meadow	60-75	76-100

(Mack, 2006 for EOLP, Depression.)

## **8.0 Monitoring**

Monitoring is required of all compensatory mitigation projects to determine if the project is meeting its performance standards and if additional measures are necessary to ensure that the compensatory mitigation project is accomplishing its goals (33 CFR §332.6; RGL 08-03). The monitoring will evaluate vegetation and wetland habitat development to determine whether remedial measures (particularly, management of invasive species) are necessary. Monitoring will take place for a period of ten years following construction and rehabilitation of the mitigation banking site, with monitoring data collected and reports submitted in at least five years of the ten year monitoring period. The COE in consultation with the IRT may reduce or waive the remaining monitoring requirements upon a determination that the compensatory mitigation project has met its performance standards, or extend the monitoring period upon a determination that performance standards have not been met, are not on track to be met, or remediation or adaptive management measures are required (33 CFR §332.6(b)).

After construction an as-built report will be submitted to members of the IRT by December 31<sup>st</sup> of the year of construction and planting. Thereafter, monitoring reports will be submitted by December 31<sup>st</sup> of each monitoring year. Monitoring years are expected to be post-construction years 2, 4, 6, 8 and 10, however, the schedule for submitting monitoring reports may be adjusted based on site conditions or to facilitate credit releases. Schedule adjustment requests will be coordinated through the COE in consultation with the IRT and do not require modification of the plan or MBI.

Monitoring reports will contain background information, methods, results and discussion. Appropriate tables, which compare the plot data collected at the mitigation banking site to select performance goals or show the plot data over time, and a map indicating the location of each sample plot, or other sampling station, will be provided. Report appendices will generally include representative photographs, aggregated random plot and focus plot VIBI scores, lists of plant species, appropriate woody stem data, FQAI scores and hydrographs. The as-built monitoring report will include representative photographs, an as-built drawing, seed and plant lists and maps or seeding/planting locations, as appropriate, and any additional baseline VIBI data.

Surface water and ground water monitoring will include a combination of submersible data loggers and fixed staff gauges (and/or other fixed points as appropriate) to measure water depths and document hydrographs for representative wetlands at the site. Quantitative hydrological data will be collected in each wetland monitoring year. The depth of soil saturation will be measured in bore holes made with a 1.2” diameter gouge auger or using subsurface data loggers at representative locations. If there is standing surface water, a grab sample will be collected in wetland monitoring year six in a representative wetland habitat within the mitigation wetland. The sample will be analyzed for ammonia, nitrates, nitrite, total organic carbon, specific conductivity, pH, turbidity and total suspended solids. The sample points for the hydrological data and water chemistry (if collected) will also be plotted on a monitoring map.

Mitigation wetland soils data will be collected in wetland monitoring year six in representative wetland habitats at the site. The monitoring will include the soil map unit name (soil series and phase), soil taxonomy and description of the soil profile and hydric soil indicators.

Vegetation monitoring will consist of VIBI focus, targeted and randomly selected plot-based monitoring in all monitoring years. Qualitative monitoring may be conducted in unscheduled years, e.g., years one and three. An appropriate number of permanent plots (twenty by fifty meter plots also referred to as focus plots) will be established in each dominant community type and vegetation will be sampled using the procedures outlined in the *Field Manual*. The location of the permanent plots will be determined following construction. An appropriate number of randomly selected and targeted plots (ten by ten meter plots) will be located within the reestablished and rehabilitated wetlands using the procedures outlined in the *Field Manual*. The same vegetation community data will be collected in these plots as specified for the intensive modules of focus plots. For the overall site, and for each monitoring year, at least the minimum number of random plots recommended in the *Field Manual* will be used for assessment. Additionally, the number of ten by ten meter plots may be increased in order to address variations in wetland development not reflected by the initial randomly selected points. Targeted plots will be located in the rehabilitated wetlands.

Woody stem data will be collected in all plots in each monitoring year following procedures outlined in the *Field Manual*. Additionally, frequency, relative density, dominance/basal area, estimated height, total cover and relative cover will be reported for planted and recruited trees and shrubs.

The sampling locations (focus and 10X10 meter targeted and random plots) will be marked on the map included with the monitoring reports. Focus plot and aggregated random and targeted plot scores will be determined from the *Automated Spreadsheets for Calculating and Reporting the Vegetation Index of Biotic Integrity (VIBI) Metrics and Scores v.1.0.1* (or successor spreadsheets) (Mack, 2007, Ohio EPA Technical Report WET/2007-2). Percent relative cover for native perennial hydrophytes, including the tree layer, *Typha* species and non-*Typha* (Appendix 7) invasive species will be determined from visual inspections and all plot data using the *Automated Spreadsheets*.

## **9.0 Management**

Routine maintenance during the reestablishment and rehabilitation of the mitigation wetlands, such as routine inspection of water control structures, checking the berms for integrity, decommissioning drain tiles, mowing in certain nonwetland areas, and surveillance for and control of undesired, invasive/exotic plant species will be conducted by NCRCPD, Envirotech Consultants, Inc. and LCMP. Adaptive habitat measures during the reestablishment and rehabilitation of the wetland may include water draw-down, culling and/or cutting of select tree species, such as *Acer rubrum* (red maple), *Fraxinus pennsylvanica* (green ash) and *Ulmus rubra* (red elm) and additional seeding and planting. A schedule of maintenance and adaptive management activities is found in Appendix D.

## **10.0 Long-Term Management**

All NCRCPD mitigation banking projects focus on the restoration and enhancement of wetlands as compensatory mitigation under the Clean Water Act (33 U.S.C. §§ 1251-1387), with the restored wetlands integrated into a member district's county park system. The NCRCPD provides the financing for restoring and managing the mitigation wetlands until long-term management is assumed by the member park district, which integrates management of the mitigation wetlands into its park management plans (NCRCPD, 1999). The mitigation banking site will be closed by the NCRCPD after the final monitoring report is submitted, the final wetland delineation is verified by the COE, and all available credits have been sold or abandoned. All long-term management funds allocated to the site will be transferred to the member park district responsible for long-term management and protection of the site.

At the end of the monitoring period, responsibility for the long-term management and protection of the Harris Road Wetland Mitigation Bank site will be assumed by the Lorain County Metropolitan Park

District (Appendix C). The reestablished and rehabilitated wetlands will be recognized as *Jurisdictional Waters of the United States* and will be protected in perpetuity. The proposed conservation easement to insure perpetual protection of the mitigation banking site (COE, 2008; §332.8(t) is attached as Appendix E.

The reestablished and rehabilitated wetlands will be parklands used for environmental education facilitated by interpretive staff and managed and maintained as wetlands in perpetuity. Wetland restoration and rehabilitation at this site will diversify the local vegetative community and wildlife habitat, provide a valuable wildlife corridor, as well as contribute to the mosaic of regional habitat diversity. With an increased number of species of plants, there will be an increase in the variety of food and habitat sources for wildlife, which will cause an increase in wildlife diversity. As a result of increased diversity of plants and wildlife, the restoration (reestablishment) will help provide a more stable natural community and protect the physical and biological integrity of the existing, rehabilitated wetlands. To increase recreational and educational use of the mitigation banking site, LCMP will include wetland programs targeted for science students attending the nearby ( $\pm 0.25$  mile) Sheffield public schools, and the mitigation banking site will be linked to a bike path along Harris Road.

## **11.0 Financial Assurances**

Based on the information presented in the Plan and to the IRT, the parties hereto agree that proper reestablishment and rehabilitation of the mitigation site in the Harris Road Wetland Mitigation Bank and management of the mitigation site by LCMP as part of its county park system will result in high level of confidence that the mitigation banking site will be successfully completed in accordance with its performance standards. The NCRCPD and its member districts have proven records as natural resource public management agencies, with experience in the restoration and maintenance of habitat complexes. Therefore, financial assurances in the form of a performance bond, casualty insurance, letter of credit, escrow account or the like will not be required. Financial assurances will be provided by contingency funds established in the adopted budget for the mitigation banking site. In addition, performance bonds will be required of contractors in accordance with the policies of the NCRCPD and applicable requirements for public construction projects.

For each acre of mitigation credit sold at the Harris Road Wetland Mitigation Bank, a minimum of \$1000 will be allocated to the contingency fund to be used only for remedial activities necessary to implement

the mitigation plan or meet the terms of the MBI. These funds shall cumulate in the contingency fund and may be used for other purposes only after attainment of all performance standards.

## **12.0 Default**

Should the District Engineer determine that the North Coast Regional Council of Park Districts is in material default of any provision of the MBI or the Plan, the District Engineer may take appropriate action (33 CFR §332.8(o)(10)). The District Engineer, in consultation with the IRT, will notify the NCRCPD in writing with reasonable specificity of the circumstances or actions which constitute a material default and provide a reasonable period of time to cure the default. If the NCRCPD fails to cure the default, the District Engineer will inform NCRCPD in writing of the action to be taken. Such actions may include, but are not limited to, suspending credit sales, adaptive management, using contingency funds, decreasing available credits, directing the use of contingency funds to purchase mitigation credits from an approved NCRCPD or other mitigation bank in the service area or another service area (which will result in a reduction of said mitigation liability to the NCRCPD), directing the use of contingency funds to a designee acceptable to the District Engineer to cure said default, taking enforcement action or terminating the MBI and subsequent credit sales.

## **13.0 Closure**

All or part of the Harris Road Wetland Mitigation Bank site can be closed in accordance with the procedures set forth in the MBI. Closed projects will be certified as such by the District Engineer in consultation with the IRT. Closure certification will be requested by the NCRCPD once performance standards have been achieved, the minimum monitoring requirements have been completed and all credits associated with the mitigation bank site have been sold or abandoned. The closing procedures will also include confirmation that LCMP, through action of its board, has integrated management and maintenance of the Harris Road Wetland Mitigation Bank into its park management plan; that the NCRCPD has transferred the remaining funds in the long term management budget account/fund to a dedicated or other appropriate fund; and such other steps as may be mutually agreed by the NCRCPD and the District Engineer.

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## **15.0 Professional Staff**

### **John M. Kiertscher, Principal and Chief Executive Officer**

Mr. Kiertscher has 22 years of experience with natural resources projects, including wetland delineations, mitigation planning, construction management, international projects and work in the regulatory environment. He is an expert in plant community identification and in the design, installation and management of native ecosystems, especially prairie, forest and wetland habitats. Mr. Kiertscher is experienced in the permitting and construction of natural systems for the treatment of wastewater and for polishing treated effluent. Mr. Kiertscher assisted in the permitting and implementation of the North Coast Regional Council of Park Districts Regional Wetland Mitigation Bank, the first regional mitigation wetland banking system in Ohio.

### **Karl L. Curry, PWS, Senior Wetlands Scientist, Environmental Scientist**

Mr. Curry is an environmental consultant experienced in the applied earth and natural sciences with expertise in aquatic ecology and wetland ecosystems. Mr. Curry performs wetland delineations, site selection studies for wetland restoration/mitigation, conducts habitat evaluations, and recommends designs and provides technical insight for planning and engineering ecological based restorations. He is responsible for ongoing wetland restoration monitoring and reporting required by state and federal agencies under the CWA. His professional experience includes analytical and applied surface and ground water hydrology, evaluating physical, chemical and biological aquatic/wetland ecosystem processes, and comprehensive riparian zone and watershed studies. Mr. Curry is a Professional Wetland Scientist with a M.S. Degree in Aquatic Ecology and B.S. Degree in Biology/Natural Resources and the Earth Sciences from Central Michigan University.

## **FIGURES**



Figure 1: State Location Map

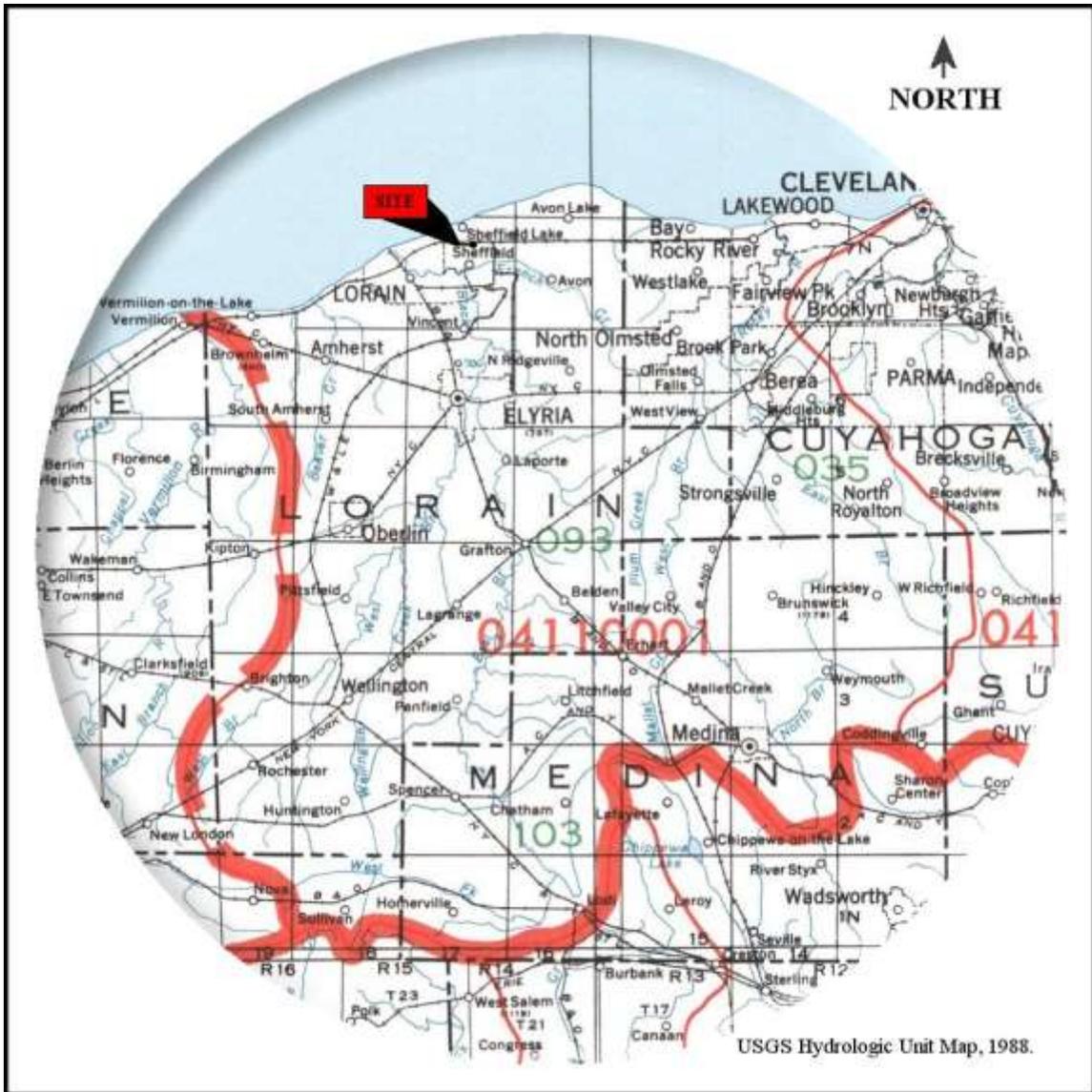


Figure 2: USGS Watershed Service Area

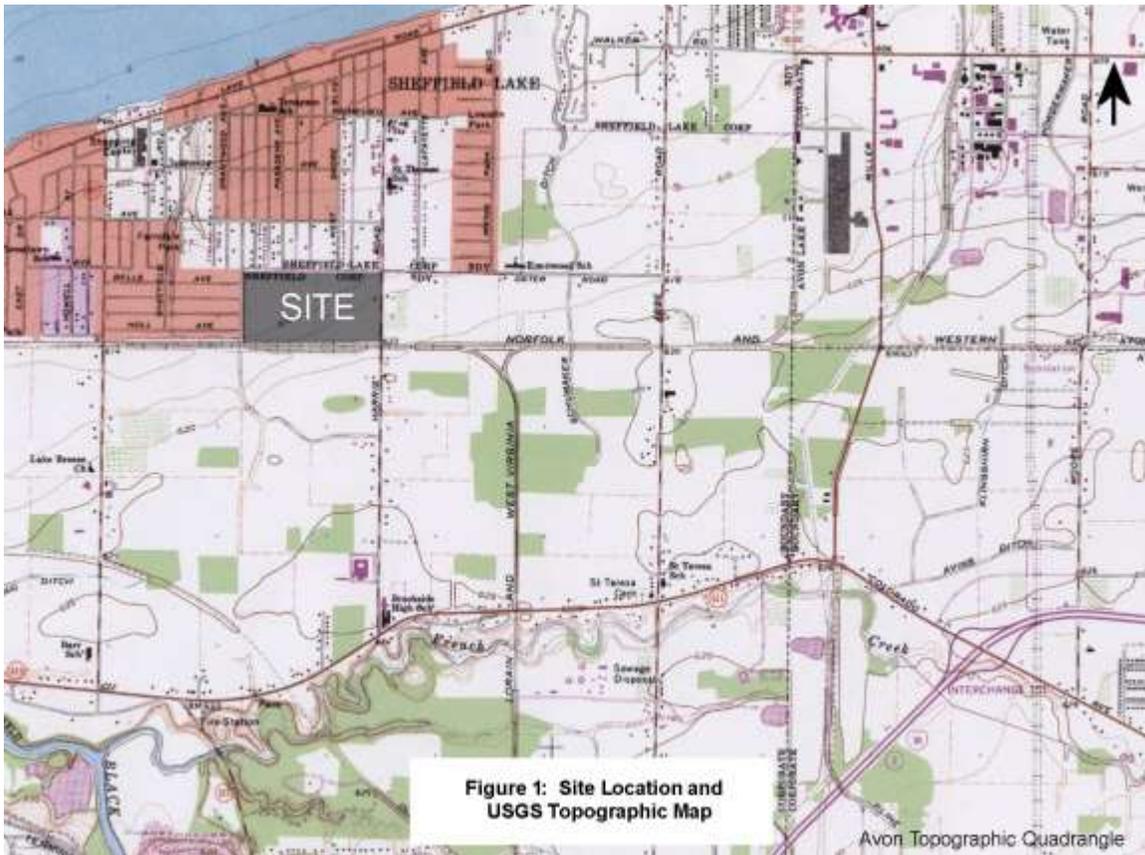


Figure 3: USGS Topographic Map



Figure 4: USDA-NRCS Soil Survey Map

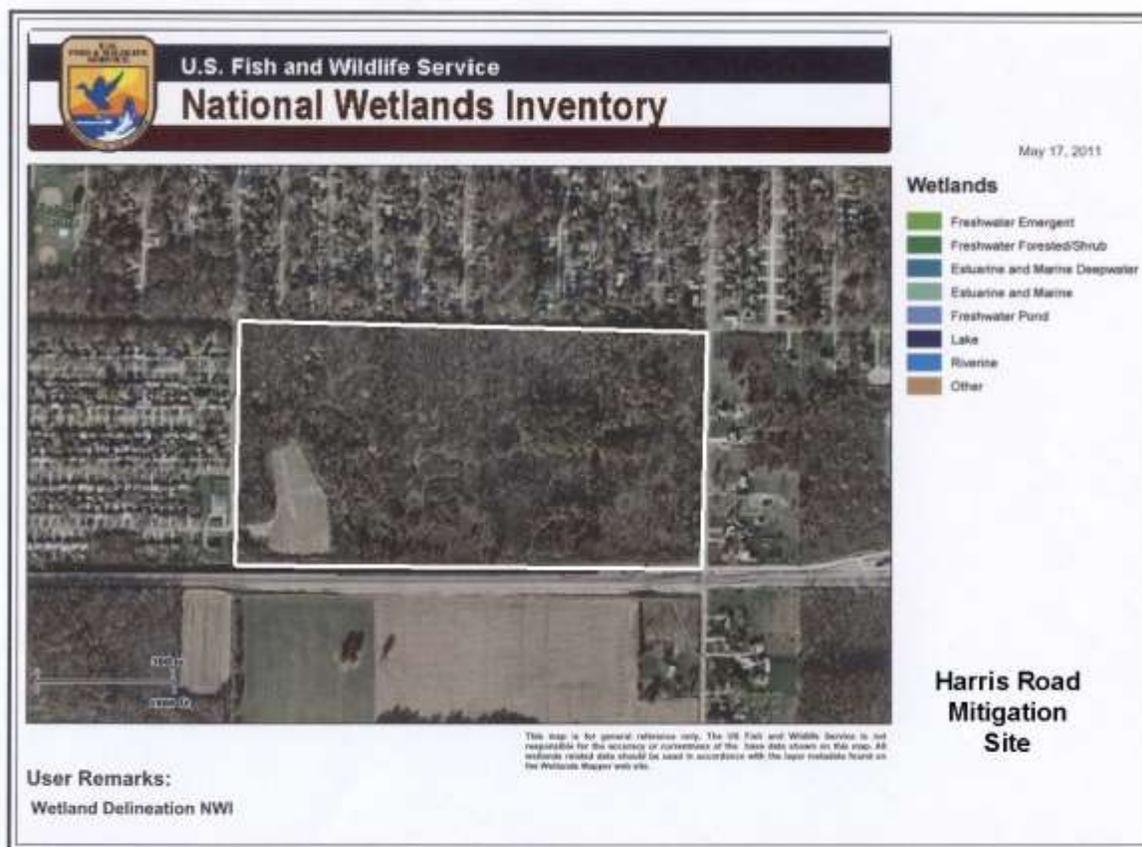


Figure 5: USFWS National Wetland Inventory (NWI) Map



## **APPENDICES**

**Appendix A  
Wetland Delineation Map**

**[Omitted: See Plan Dated 2/20/2012]**

**Appendix B**  
**Jurisdictional Determination Letter**

**[Omitted: See Plan Dated 2/20/2012]**

**APPENDIX C  
RESPONSIBLE PARTIES AND CONTACTS**

<b>NAME</b>	<b>ROLE/POSITION</b>	<b>ENTITY</b>	<b>ADDRESS</b>	<b>PHONE</b>
North Coast Regional Council of Park Districts	Responsible Party; Regional Council, ORC Chapter 167	NCRCPD	12882 Diagonal Road LaGrange, OH 44050	(440) 458-5121
Lorain County Metropolitan Park District	Landholder & Long-term Manager; Metropolitan Park District, ORC Chapter 1545	LCMP	12882 Diagonal Road LaGrange, OH 44050	(440) 458-5121
Medina County Park District	Easement Holder; Metropolitan Park District, ORC Chapter 1545	MCPD	6364 Deerview Lane Medina, OH 44256	(330) 722-9364
James Ziemnik	Director, LCMP Member, NCRCPD	LCMP NCRCPD	12882 Diagonal Road LaGrange, OH 44050	(440) 458-5121
John M. Kiertscher	CEO	Envirotech Consultants, Inc.	5380 Twp. Rd. 143 NE Somerset, OH 43783	(740) 743-1669
Karl L. Curry	Senior Wetland Scientist	Envirotech Consultants, Inc.	5380 Twp. Rd. 143 NE Somerset, OH 43783	(740) 743-1669
Scott E. Sonnenberg	Project Engineer	Eco-Design & Engineering, Ltd.	7701 Wells Road Plain City, OH 43064	(614) 733-0049

**Appendix D**  
**Schedule of Maintenance and Adaptive Management Activities**

<b>ACTIVITY</b>	<b>SCHEDULE</b>	<b>PERSONNEL</b>
<u>I. Routine Wetland Maintenance During Reestablishment and Rehabilitation</u> Inspection & upkeep of water control structures	Several times during spring (March-May) & after storm events	Envirotech & NCRCPD
Checking berms for integrity	Late summer and early fall & during scheduled monitoring visits	Envirotech & NCRCPD
Decommission drain tiles	Periodic, as discovered	NCRCPD
Invasive species management	Periodic, as needed, during growing season	NCRCPD
<u>II. Mowing in certain nonwetland areas</u>	Periodic, if needed, during growing season	LCMP
<u>III. Adaptive Management of Wetland Areas</u> Water draw-down, additional seeding & planting, culling of undesirable species	After 2-3 years post-construction, if necessary for vegetative development	Envirotech & NCRCPD

**Appendix E**  
**Proposed Conservation Easement**

## GRANT OF CONSERVATION EASEMENT

This Grant of Conservation Easement (this “Grant” or this “Conservation Easement”) is made by the Board of Park Commissioners, Lorain County Metropolitan Park District (“Grantor”), a park district formed under the authority of Chapter 1545 of the Ohio Revised Code (“ORC”), to the Board of Park Commissioners of the Medina County Park District (“Grantee”), a park district formed under the authority of Chapter 1545 of the Ohio Revised Code.

### WITNESSETH:

**WHEREAS**, Grantor is the owner in fee simple of real property with an area of approximately 77 acres located west of Harris Road in Sheffield Township, Lorain County, Ohio, where wetlands will be restored within the Black/Rocky River Watershed, which contains the “Easement Area,” legally described in Exhibit A and further designated in Exhibit B, both of which exhibits are attached hereto and made a part hereof; and

**WHEREAS**, under Section 5301.69(B) of the ORC, Grantee may acquire and hold conservation easements; and

**WHEREAS**, the Easement Area possesses substantial value in conserving and protecting the physical, biological and chemical integrity of wetlands and is important in the protection of the existing or designated use of the waters of the United States and of the State pursuant to the Clean Water Act, 33 U.S.C. §§ 1251-1387, and ORC Chapter 6111. The specific conservation values (collectively, “Conservation Values”) of the Easement Area have been documented in the Plan for the Harris Road Wetland Mitigation Bank, last dated April 9, 2014 (the “Plan”); and

**WHEREAS**, Grantor and Grantee are member districts of the North Coast Regional Council of Park Districts (“NCRCPD”), a council of governments formed under the authority of Chapter 167 of the ORC, which received approval of the Interagency Review Team (“IRT”), which includes the US Army Corps of Engineers, Buffalo District, to establish the Harris Road Wetland Mitigation Bank in accordance with the terms and conditions of its mitigation banking instrument; and

**WHEREAS**, Grantor proposes to fulfill the obligation to ensure the Easement Area and its Conservation Values are protected in perpetuity by this Conservation Easement; and

**WHEREAS**, Grantor and Grantee recognize the Conservation Values of the Easement Area, and have, by the conveyance and acceptance of this Conservation Easement, respectively, the common purpose of (a) conserving and protecting the Easement Area in perpetuity as natural wetland habitat and (b) providing benefits to the citizens of Ohio and Lorain County by maintaining the Easement Area as passive use parklands; and

**WHEREAS**, “passive use parklands” for purposes of this Grant means parkland uses and management practices which (a) provide habitat for native plants and wildlife, (b) avoid significant degradation of habitat and water quality, (c) promote educational and recreational uses of wetland habitat through trails, trail linkages and interpretive programs and (d) limit physical alteration of the Easement Area to the Future Improvements and to those activities not otherwise restricted by paragraph B4; and

**WHEREAS**, Grantor and Grantee intend that this Conservation Easement shall be a “conservation easement” as defined in ORC Section 5301.67; and

**WHEREAS**, Grantee is willing to accept this Conservation Easement subject to the reservations and to the terms, conditions and obligations set out herein; and

**NOW, THEREFORE**, for and in consideration of the premises and the foregoing recitations, and in further consideration of the mutual promises, covenants, terms, conditions, and restrictions hereinafter set forth, Grantor does hereby grant, give, and convey unto Grantee, its successors and assigns, in perpetuity, a conservation easement of the nature and character and to the extent hereinafter set forth, over the Easement Area, for the purposes of preserving, protecting, and maintaining the Easement Area as natural wetland habitat and as passive use parklands. Grantor will neither perform, nor knowingly allow others to perform, any act on or affecting the Easement Area that is materially inconsistent with the covenants contained herein. Grantor authorizes Grantee to enforce these covenants in the manner described in this Grant.

**A. PURPOSES FOR WHICH THIS CONSERVATION EASEMENT IS GRANTED**

This Conservation Easement is granted for the following purposes (collectively, the “Conservation Purposes”):

1. Preservation of the Easement Area for the public purpose of retaining land, water and wetland areas predominantly in their natural, scenic, open and wooded condition, and as suitable habitat for fish, plants or wildlife; and
2. Limiting the use of the Easement Area to passive recreational and educational uses.

**B. TERMS, CONDITIONS AND RESTRICTIONS**

1. **Representations as to Authority.** Grantor hereby represents and warrants to Grantee that Grantor has the power and authority to make this Grant and to carry out its obligations hereunder.

2. **Reserved Rights.**

- (a) **General.** Grantor reserves all ordinary rights and privileges of ownership, including the right to sell or lease the Easement Area, as well as the right to continue the use of the Easement Area for all purposes consistent with the Conservation Purposes not destructive of Conservation Values, and not expressly prohibited or conditioned hereunder; provided that nothing in this Grant shall relieve Grantor of any obligation with respect to the Easement Area or restrictions on the use of the

Easement Area imposed by law. Grantor reserves the right to engage in all acts or uses on the Easement Area that are not prohibited by governmental statute or regulation, are not expressly prohibited or conditioned herein, and are not inconsistent with the Conservation Purposes.

- (b) Restoration of Habitat. Grantor reserves the right to restore and rehabilitate wetland and associated upland/buffer habitat anywhere on the Easement Area in accordance with the Plan in a manner that does not have an adverse impact on the Conservation Values of the Easement Area and is otherwise consistent with the Conservation Purposes.
- (c) Notice. Grantor shall notify Grantee, in writing, before exercising any right reserved by Grantor in this Conservation Easement that may have an adverse impact on the Conservation Values; provided, however that any failure of Grantor to give such notice shall not be considered a default or violation of this Conservation Easement.

**3. Future Improvements**. Notwithstanding anything to the contrary contained in this Grant, Grantor and Grantee agree that structures and improvements typically used in parks, such as, but not limited to, shelters, parking areas, access roads, recreational trails for hiking and other similar purposes (collectively, the “Future Improvements”), may be constructed and thereafter maintained, expanded or remodeled in nonwetland habitat on the Easement Area.

**4. Use Restrictions**.

- a. Division: Any division or subdivision of the Easement Area is prohibited.
- b. Commercial Activities; Active Recreational Facilities: Commercial development or industrial activity on the Easement Area is prohibited as is the development of sports fields and courts, golf courses and motor vehicle tracks.
- c. Construction: The placement or construction of any man-made structures on the Easement Area is prohibited except as provided for in paragraph 3.
- d. Cutting Vegetation: Except as may be necessary for reasonable management or restoration purposes to promote or maintain a diversity of habitat types and control nonnative, invasive or exotic species, or prevent hazards, control disease and pests, any cutting of trees, ground cover or vegetation, or destroying by means of herbicides or pesticides on the Easement Area is prohibited.
- e. Dumping: Waste, garbage and unsightly or offensive materials are not permitted and may not be accumulated on the Easement Area.
- f. Water Courses: Natural water courses and streams and adjacent riparian buffers may not be dredged, straightened, filled, channelized, impeded, diverted or otherwise altered on the Easement Area without the advance approval of the US Army Corps of Engineers and/or the Ohio EPA.

5. **Real Property Interest.** This Conservation Easement constitutes a real property interest immediately vested in Grantee.
6. **Right to Enter and Inspect.** Grantee, or its duly authorized representatives, may enter the Easement Area at all reasonable times, after not less than 24 hours written or telephone notice, for the purposes of inspecting the Easement Area in order to further the objectives of and determine compliance with the terms of this Conservation Easement; provided that no such notice need be given prior to Grantee entering the Easement Area under emergency circumstances. "Emergency Circumstances" shall mean that Grantee has a good-faith basis to believe that a violation of this Conservation Easement is occurring or is imminent.
7. **Permission of Grantee.** Where Grantor is required to obtain Grantee's permission, approval or consent for a proposed action hereunder, such permission, approval or consent shall (a) be sought and given in writing, (b) in all cases be obtained by Grantor prior to Grantor taking the proposed action, and (c), except in the case of a request that Grantee in its sole discretion determines could result in the impairment or destruction of significant conservation interests, not be unreasonably conditioned, delayed or withheld. Grantee's response to any such request shall be based on Grantee's evaluation of the impact of the request on the Conservation Values of the Easement Area. Grantee shall grant or withhold its approval in writing within 30 days after receipt of Grantor's written request therefor. In the case of withholding of approval, Grantee shall notify Grantor in writing with reasonable specificity of the reasons for withholding of approval, and the conditions, if any, on which approval might otherwise be given.
8. **Grantee's Remedies.** If Grantor is in violation of the terms of this Conservation Easement, Grantee shall give written notice to Grantor of such violation and demand corrective action sufficient to cure the violation and, if the violation involves damage to the Easement Area resulting from any use or activity inconsistent with the Conservation Purposes, to restore the portion of the Easement Area so damaged. If Grantor fails to cure the violation within 30 days after receipt of notice thereof from Grantee, or if the violation cannot reasonably be cured within a 30-day period, Grantor fails to begin curing such violation within the 30-day period or, once having commenced a cure, fails to continue diligently to cure such violation until finally cured, Grantee may bring an action at law or in equity in a court of competent jurisdiction to enforce the terms of this Conservation Easement, to enjoin the violation *ex parte* if necessary, by way of temporary or permanent injunction, to recover from Grantor any damages to which it may be entitled for violation of the terms of this Conservation Easement or damage to any of the Conservation Values arising from such violation, including damages for diminished environmental values, and to

require the restoration of the Easement Area to the condition that existed prior to any such damage, without limiting Grantor's liability therefor. Grantee, in its sole discretion, may apply any damages recovered to the cost of undertaking any corrective action on the Easement Area. If Grantee, in its reasonable discretion, determines that circumstances require its immediate action to prevent or mitigate significant damage to the Conservation Values of the Easement Area, Grantee may pursue its remedies under this paragraph upon giving notice to Grantor of such circumstances but without waiting for the period provided for cure to expire. Grantee's rights under this paragraph apply equally in the event of either actual or threatened violation of the terms of this Conservation Easement, and Grantor agrees that Grantee's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in this paragraph, both temporary and permanent, in addition to such other relief to which Grantee may be entitled, including specific performance of the terms of this Conservation Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. Grantee's remedies described in this paragraph apply to violations caused directly by Grantor or by third persons, whether or not claiming by, through or under Grantor, and shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity. Grantee does not waive or forfeit the right to take action as may be necessary to ensure compliance with the terms, conditions and purposes of this Conservation Easement by prior failure to act.

9. **Upkeep and Maintenance.** Grantor shall be solely responsible for the upkeep and maintenance of the Easement Area to the extent required by law. Grantee shall have no obligation for the upkeep or maintenance of the Easement Area.
10. **Taxes.** Grantor shall pay all taxes validly levied and assessed against the Easement Area, including any such taxes validly levied and assessed against this Conservation Easement by competent authorities, it being understood that no taxes are presently levied against conservation easements generally in the State of Ohio, or, to the knowledge of Grantor or Grantee, are such taxes contemplated by any taxing authority with jurisdiction over the Easement Area.
11. **Incorporation in Subsequent Instruments.** In order to assure that the transferee of title to or a possessory interest in the Easement Area is aware of the existence of this Grant, Grantor agrees that a reference to this Conservation Easement shall be incorporated in any subsequent deed, or other legal instrument, by which Grantor divests either the fee simple title to, or a possessory interest in, the Easement Area.

**12. Amendment; Discretionary Approval.**

- (a) Background. Grantee and Grantor recognize that future circumstances that are unforeseen at the time of this Grant may arise which make it beneficial or necessary to take certain action in order to ensure the continued protection of the Conservation Values of the Easement Area and to guaranty the perpetual nature of this Conservation Easement. Any such action, if determined to be beneficial or necessary, shall be in the form of either (i) an amendment, in the case of a permanent modification of the terms of this Conservation Easement, including but not by way of limitation, a clerical or technical correction or modification of a reserved right; or (ii) a discretionary approval, in the case of a temporary activity or impact relating to the maintenance or management of the Easement Area which does not require a permanent modification of the Conservation Easement terms. All amendments and discretionary approvals shall be subject to this paragraph 12. Nothing in this paragraph, however, shall require Grantor or Grantee to consult or negotiate regarding, or to agree to any amendment or discretionary approval.
- (b) Amendment. This Grant may be amended only with the written consent of Grantee and Grantor and with sixty (60) days prior written notice to the US Army Corps of Engineers, Buffalo District. Grantee shall not consent to any amendment of this Conservation Easement unless (i) Grantor submits a written request for amendment; and (ii) the effect of such amendment is neutral with respect to or enhances the Conservation Purposes. Any such amendment shall be consistent with the purposes of this Grant and shall also be consistent with ORC Sections 5301.67 through 5301.70 and any regulations promulgated pursuant to such sections. Any such amendment shall be recorded in the Official Records of Lorain County, Ohio and a recorded copy shall be provided to the US Army Corps of Engineers, Buffalo District.
- (c) Discretionary Approval. Grantee's consent for activities otherwise prohibited under this Conservation Easement may be given under the following conditions and circumstances. If, owing to unforeseen or changed circumstances, the performance of an activity prohibited under this Conservation Easement is deemed beneficial or necessary by Grantor, Grantor may request, and Grantee may in its sole discretion grant, permission for such activity without resorting to the amendment process, subject to the following limitations. Such request for Grantee's consent shall (i) be made, and Grantee shall consider and respond to such request in accordance with the provisions of paragraph 7, titled Permission of Grantee; and (ii) describe the proposed activity in sufficient detail to allow Grantee to evaluate the consistency of

the proposed activity with the purpose of this Conservation Easement. Grantee may grant its consent only if it determines that (iii) the performance of such activity is, in fact, beneficial or necessary; and (iv) such activity (A) does not violate the purpose of this Conservation Easement, and (B) results in an outcome that is neutral with respect to or enhances the Conservation Purposes of this Conservation Easement.

(d) General. Notwithstanding the foregoing, Grantee and Grantor shall have no power or right to agree to any activity that would (i) result in the extinguishment of this Conservation Easement; (ii) adversely affect the perpetual nature of this Conservation Easement; (iii) adversely affect the qualification of this Conservation Easement or the status of Grantee under the laws of the State of Ohio; or (iv) result in either private benefit or inurement to any party.

13. Assignment. Grantee may transfer or assign all or less than all of Grantee's rights and obligations under this Conservation Easement if, in Grantee's opinion, the purposes of this Conservation Easement are better served by this Conservation Easement being held in the name of another organization or in the name of more than one organization which is a qualified organization at the time of transfer under the laws of the State of Ohio (especially ORC Section 5301.69), and is acceptable to Grantee. The selection of the transferee shall be made by the Board of Park Commissioners of Grantee or if Grantee has ceased to exist, the statutory or court appointed successors of Grantee. As a condition of such transfer, Grantee shall require that the Conservation Purposes that this Conservation Easement is intended to advance continue to be carried out.

14. Extinguishment. If future circumstances render the purpose of this Conservation Easement impossible to accomplish, this Conservation Easement can be terminated or extinguished, whether with respect to all or part of the Easement Area, only by judicial proceedings in a local court of competent jurisdiction. Unless otherwise required by applicable law at the time, in the event of any sale of all or a portion of the Easement Area after such termination or extinguishment, and net of any costs or expenses associated with such sale, Grantor shall receive 100 percent (100%) of the proceeds from such sale.

15. Eminent Domain. It is the intent of this Grant to convey to Grantee, its successors and assigns, such an interest in the Easement Area as is sufficient to discourage the exercise of the power of eminent domain by public utility and any other body or person. If all or any part of the Easement Area is taken under the power of eminent domain by public, corporate, or other authority, or otherwise acquired by such authority through a purchase in lieu of a taking, Grantor and Grantee shall join in appropriate proceedings at the time of such taking to recover the full value of the interests in the Easement Area subject to the taking and all

incidental or direct damages resulting from the taking. All expenses reasonably incurred by Grantor and Grantee in connection with such taking shall be paid out of the recovered proceeds. Grantor shall be entitled to all net compensation from the balance of the recovered proceeds. The respective rights of Grantor and Grantee set forth in this paragraph 15 shall be in addition to, and not in limitation of, any rights they may have at common law.

16. **Notice of Proposed Transfer.** Grantor shall give Grantee and the US Army Corps of Engineers, Buffalo District, notice of the proposed transfer of any interest in the Easement Area at least sixty (60) days prior to such transfer.
17. **Forbearance Not a Waiver.** Any forbearance by Grantee to exercise its rights under this Conservation Easement in the event of any violation of this Conservation Easement shall not be deemed or construed to be a waiver by Grantee of such violation or another violation of this Conservation Easement or of any of Grantee's rights under this Conservation Easement. No delay or omission by Grantee in the exercise of any right or remedy upon any breach shall impair such right or remedy or be construed as a waiver.
18. **Rules of Convenience.** All references to either Grantor or Grantee include their respective successors and assigns unless otherwise noted. The captions in this Conservation Easement are for convenience only and are not intended by the parties to affect the meaning or interpretation of the terms thereof.
19. **Applicable Law; Severability.** This Conservation Easement is intended to be performed in accordance with, and only to the extent permitted by all applicable laws, ordinances, rules and regulations of the State of Ohio. If any provision of this Conservation Easement or the application thereof to any person or circumstance shall, for any reason and to any extent, be invalid or unenforceable, the remainder of this Conservation Easement or application of such term or provision to persons or circumstances other than those to which it is held invalid or unenforceable shall not be affected thereby but rather shall be enforced to the fullest extent permitted by law.
20. **Entire Agreement.** This instrument sets forth the entire agreement of the parties with respect to this Conservation Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to this Conservation Easement.
21. **Notices.** Any notice, demand, request, consent, approval, instruction or communication that either party desires or is required to give to the other hereunder shall be in writing and either delivered personally or sent by United States registered or certified mail, return receipt requested, postage prepaid, or by prepaid overnight express courier, and addressed as follows:

To Grantor: Board of Park Commissioners of the  
Lorain County Metropolitan Park District  
12882 Diagonal Road  
LaGrange, OH 44050  
Attention: Director

To Grantee: Board of Park Commissioners of the  
Medina County Park District  
6364 Deerview Lane  
Medina, OH 44256  
Attention: Director

or to such other address as either of the above parties from time to time shall designate by written notice to the other, and the same shall be effective upon receipt if delivered personally or by overnight courier or three business days after deposit in the mail, if mailed. If any deadline under this Conservation Easement falls on a Saturday, Sunday or legal holiday (which for purposes of this Grant shall not be considered a “business day”), the deadline shall be extended to the next business day.

22. **Recordation.** Grantor and Grantee intend that the restrictions arising hereunder take effect on the day and year this Conservation Easement is recorded in the Deed or Official Records of Lorain County, Ohio, after all required signatures have been affixed hereto. Grantor will record this Conservation Easement within thirty days after the date of the final required signature and will distribute copies of the recorded Conservation Easement to Grantee and the US Army Corps of Engineers, Buffalo District.
23. **No Extinguishment Through Merger.** Grantor and Grantee herein agree that (a) this Conservation Easement shall not be extinguished through the doctrine of merger in whole or in part in view of the public interest in its enforcement, and (b) should all or a portion of the fee interest subject to this Conservation Easement and the Conservation Easement, itself, come to be owned by the same owner, such owner as promptly as practicable shall assign this Conservation Easement of record to another holder in conformity with the requirements of paragraph 13. The instrument of assignment shall refer to the provisions of this paragraph, and shall contain confirmatory language suitable to reimpose this Conservation Easement to the extent, if any, necessary to continue it in force.
24. **Termination of Rights and Obligations.** A party’s rights and obligations under this Conservation Easement terminate upon transfer of that party’s interest in this Conservation Easement or in the Easement Area, except that liability for acts or omissions occurring prior to such transfer shall survive transfer.

**TO HAVE AND TO HOLD**, unto and to the use of Grantee, its successors and assigns, forever. The covenants agreed to and the terms, conditions, restrictions, and purposes imposed as aforesaid shall be binding not only upon Grantor and Grantee, but also their respective agents and all other successors to them in interest, and shall continue as a servitude running in perpetuity with the Easement Area.

**IN WITNESS WHEREOF**, Grantor has executed this instrument this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**GRANTOR:**

**BOARD OF PARK COMMISSIONERS, LORAIN  
COUNTY METROPOLITAN PARK DISTRICT**

By: \_\_\_\_\_

James Ziemnik

Its: Director

STATE OF OHIO            )  
                                  )        **SS:**  
COUNTY OF LORAIN    )

**BEFORE ME**, a Notary Public in and for said County and State, personally appeared the above-named Board of Park Commissioners, Lorain County Metropolitan Park District by James Ziemnik, its Director, who acknowledged that he did execute the foregoing instrument and that the same is his own free act and deed as such Director and the free act and deed of such Board.

**IN TESTIMONY WHEREOF**, I have hereunto set my hand and affixed my official seal this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

**ACCEPTANCE**

The undersigned does hereby consent to and accept the within Conservation Easement and all obligations imposed thereby.

**IN WITNESS WHEREOF**, the undersigned has executed and delivered this Acceptance this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**GRANTEE:**

**BOARD OF PARK COMMISSIONERS, MEDINA  
COUNTY PARK DISTRICT**

By: \_\_\_\_\_  
Thomas K. James  
Its: Director

STATE OF OHIO            )  
                                  )        **SS:**  
COUNTY OF MEDINA    )

**BEFORE ME**, a Notary Public in and for said County and State, personally appeared the above-named Board of Park Commissioners, Medina County Park District by Thomas K. James, its Director, who acknowledged that he did execute the foregoing instrument and that the same is his own free act and deed as such Director and the free act and deed of such Board.

**IN TESTIMONY WHEREOF**, I have hereunto set my hand and affixed my official seal  
this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public

This Instrument Prepared By:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix F**  
**Mitigation Work Plan Specifications**  
**Construction Drawings**  
**Details**

# **MITIGATION WORK PLAN**

**Part I**      **Technical Specifications**

**Part II**     **Construction Plans and Details**

## INDEX TO TECHNICAL SPECIFICATIONS

### Division 1 – General Requirements

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### Division 2 – Site Work

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## Section 01000 – General Requirements

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 GENERAL

Conflicts: In the event that Specifications conflict with those in other Contract Documents, including General Conditions or the drawings, Contractor shall report such conflict to the Owner or the Owner's Representative who shall be the sole interpreter of the intent of the Contract Documents and the manner of resolving conflicts. In the event that Specifications conflict with the drawings, Contractor shall also report such conflict to the Engineer.

### 2.0 PROJECT DESCRIPTION

A. Description: The project consists of the construction of approximately 57 acres of wetland reestablishment and rehabilitation at the Harris Road Wetland site, in Sheffield Township near Sheffield Lake, Lorain County, Ohio.

B. Scope of Work: Work includes clearing, earthwork, aggregate construction/staging areas, installation of control structures, pollution prevention measures, construction of small terraces, hummocks/dead furrows, depressional seasonal wetlands and low berms, the stabilization of all disturbed areas, decommissioning of drain tile, seeding, planting and the procurement of seed and plants. The Contractor shall mobilize and de-mobilize all equipment by the access routes set forth in the drawings or as otherwise indicated by Owner.

### 3.0 WORK SEQUENCE

General Requirements: All Work shall be commenced as soon as possible and substantially completed no later than the date specified in the bid documents. The Contractor shall complete the Work in the sequence specified by the Engineer. The sequence of Work will be reviewed at the pre-construction meeting.

END OF SECTION

## SECTION 01030 – PROJECT COORDINATION

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SUMMARY

General Requirements: This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to: Coordination; General installation provisions; Cleaning and protection.

### 2.0 COORDINATION

A. General Requirements: The Contractor shall be responsible for coordinating all other subcontractors, schedules, applications for payments, submittals, meetings, etc., when a single contract is issued.

B. Coordination of Construction: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Memoranda: Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to the following: 1. Preparation of schedules; 2. Installation and removal of temporary facilities; 3. Delivery and processing of submittals; 4. Progress meetings and memoranda; 5. Project close-out activities.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, materials and best management practices.

### 3.0 GENERAL INSTALLATION PROVISIONS

A. Inspection by Installer: Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.

C. Material Inspection: Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Secure Work: Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level.

E. Recheck: Recheck measurements and dimensions, before starting each installation

F. Installation Considerations: Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

G. Uncovering of Construction: Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

#### **4.0 CLEANING AND PROTECTION**

A. Protect Construction: During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Maintain Construction: Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limit Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following: excessive static or dynamic loading; excessive internal or external pressures; excessively high or low temperatures; thermal shock; excessively high or low humidity; air contamination or pollution; water or ice; solvents; chemicals; light; radiation; puncture; abrasion; heavy traffic; soiling, staining and corrosion; bacteria; rodent and insect infestation; combustion; electrical current; high speed operation; improper lubrication; unusual wear or other misuse; contact between incompatible materials; destructive testing; misalignment; excessive weathering; unprotected storage; improper shipping or handling; flooding; theft; vandalism.

END OF SECTION

## SECTION 01050 – SUBMITTALS

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SUMMARY

A. General Requirements: This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including: Submittal Procedures; Contractor's construction schedule; Submittal schedule; Weekly construction reports; Shop Drawings; Owner's Representative's Action.

B. Administrative Submittals: Refer to the other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to: applications for payment; performance and payment bonds; insurance certificates; prevailing wage submittals; waiver of lien; list of Subcontractors.

### 2.0 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

B. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals. No extension of Contract Time will be authorized because of failure to transmit submittals to the Owner's Representative sufficiently in advance of the Work to permit processing.

C. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. List section of the specifications on the submittal covers.

D. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Owner's Representative using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

### 3.0 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Schedule: Prepare a fully developed Contractor's construction schedule. Submit schedule at pre-construction meeting.

1. Indicate each significant construction activity. Use the same breakdown of units of the Work as indicated in the AIA form "Schedule of Values."

2. Estimate completion date.

3. Prepare the schedule on a sheet, or series of sheets of sufficient width to show data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence.

5. Coordinate the Contractor's construction schedule with the AIA form Schedule of Values, list of subcontracts, other separate prime contractors, submittal schedule, progress reports, payment requests and other schedules.

6. Indicate completion in advance of the date established for Substantial Completion.

B. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

C. Cost Correlation: At the head of the schedule, provide a cost correlation line. On the line show dollar-volume of Work performed as of the dates used for preparation of payment requests.

D. Distribution: Following response to the initial submittal, print and distribute copies to the Owner's Representative, Owner, subcontractors, and other parties required to comply with scheduled dates. When revisions are made, distribute to the same parties. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

E. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

#### **4.0 SUBMITTAL SCHEDULE**

A. Submittal Priority Schedule: After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.

B. Distribution: Following response to initial submittal, print and distribute copies to the Owner's Representative, Owner, subcontractors, and other parties required to comply with submittal dates indicated. When revisions are made, distribute to the same parties. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

#### **5.0 WEEKLY CONSTRUCTION REPORTS**

General Requirements: Prepare a weekly construction report, recording the following information concerning events at the site; and submit duplicate copies to the Owner's Representative at weekly intervals: list of subcontractors at the site; approximate count of personnel at the site; high and low temperatures; general weather conditions; accidents and unusual events; meetings and significant decisions; stoppages, delays, shortages, losses; meter readings and similar recordings; emergency procedures; orders and requests of governing authorities; Change Orders received, implemented; services connected, disconnected; equipment or system tests and start-ups; partial completions, occupancies; Substantial Completions authorized.

#### **6.0 SHOP DRAWINGS**

A. General Requirements: If required, submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Specifications: Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information: dimensions; identification of products and materials included; compliance with specified standards; notation of coordination requirements; notation of dimensions established by field measurement; calculations where required; professional seal where required.

1. Submit 4 blue or black-line prints. Two prints will be retained; the remainder returned. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

## **7.0 OWNER'S REPRESENTATIVE'S ACTION**

General Requirements: Except for submittals for record, information or similar purposes, where action and return is required or requested, the Owner's Representative will review each submittal, mark to indicate action taken, and return promptly.

END OF SECTION

## SECTION 01060 – QUALITY CONTROL SERVICES

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SUMMARY

A. General Requirements: This Section specifies administrative and procedural requirements for quality control services. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor.

B. Inspection and Testing Services: Inspection and testing services may be required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

### 2.0 RESPONSIBILITIES

A. General Requirements: The Owner shall hire an independent testing agency for quality control services. The Contractor shall coordinate and the Owner shall pay for first time inspections, tests and similar quality control services, as specified in individual Specification Sections and required by governing authorities. These services include those specified to be performed by an independent agency and not by the Contractor.

B. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

C. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition to the Contractor, each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

D. Quality Assurance: Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

END OF SECTION

## SECTION 01070 – TEMPORARY FACILITIES

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SUMMARY

A. General Requirements: This Section describes temporary services and facilities, including utilities, construction and support facilities. Temporary utilities include, but are not limited to: Temporary electric power and light.

B. Temporary Facilities: Temporary construction and support facilities include, but are not limited to: field offices and storage sheds; temporary roads; temporary enclosures; temporary Project identification signs and bulletin boards; toilets; waste disposal services; erosion control; construction aids and miscellaneous services and facilities; environmental protection.

C. Contractor Responsibilities: The Contractor is responsible for the installation, maintenance, removal, and cost for all temporary facilities. The Contractor shall provide a temporary toilet. Other temporary facilities described in this Section may be provided by Contractor.

### 2.0 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation & Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

### 3.0 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to: building code requirements; health and safety regulations; utility company regulations; police, fire department and rescue squad rules; environmental protection regulations and best management practices.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A1 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library, "Temporary Electrical Facilities." Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

1. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

2. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

### 4.0 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

## 5.0 MATERIALS

General Requirements: If temporary facilities are installed by Contractor, provide materials suitable for the use intended.

## 6.0 EQUIPMENT

A. General Requirements: Provide new equipment. If acceptable to the Owner's Representative, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

C. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

D. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

E. Temporary Offices: Provide prefabricated or mobile units with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

F. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

G. First Aid Supplies: Comply with governing regulations.

H. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

## 7.0 INSTALLATION

General Requirements: Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

## 8.0 TEMPORARY UTILITY INSTALLATION

A. General Requirements: Engage the appropriate local utility company to install temporary

service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
4. Cost or use charges for temporary facilities are not chargeable to the Owner, and will not be accepted as a basis of claims for a Change Order.

**B. Temporary Electric Power Service:** Provide weatherproof, grounded electric power service and a distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

**C. Power Distribution System:** Install wiring overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, AC 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

## **9.0 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION**

**A. General Requirements:** Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. The use of Owner's buildings and facilities will not be available to the Contractor.

**B. Field Offices:** Provide insulated, weather-tight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. At a minimum, the following must be provided in the field office: a cell phone; a set of drawings; access on-site to drawings at all times; a board to post notices, permits, etc.; a place to hold weekly meetings; one temporary toilet; one bottled water drinking unit.

**C. Toilets:** Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. Provide minimum of one (1) portable unit.

**D. Project Identification and Temporary Signs:** Prepare one project identification sign of the size and type required as per Owner's standards. Install sign where directed by Owner's Representative. Do not permit installation of unauthorized signs.

**E. Collection and Disposal of Waste:** Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80° F (27° C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

**F. Environmental Protection:** Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations and best

management practices, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site. Clean all vehicles exiting the site of mud, debris, etc. Clean all adjacent surface streets as necessary or reasonable to remove dirt and mud.

## **10.0 OPERATION, TERMINATION AND REMOVAL**

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

C. Termination and Removal: Unless the Owner's Representative requires that it be maintained longer, remove each temporary facility when the need has ended, or no later than Substantial Completion. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of the Project identification sign.

END OF SECTION

## SECTION 01080 – PROJECT CLOSEOUT

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract Documents and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SUMMARY

A. General Requirements: This Section specifies administrative and procedural requirements for project closeout, including but not limited to: Inspection procedures; Project record document submittal; Operating and maintenance manual submittal; Submittal of warranties; Final cleaning.

B. Preparation and Submittal: The Contractor shall prepare and submit all project close-out materials under a single contract.

### 2.0 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documents for completion as indicated in the Contract Documents and a statement showing an accounting of changes to the Contract Price.
2. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Submit record drawings, final project photographs, damage or settlement survey, and similar final record information.
6. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
7. Complete final clean up requirements.

B. Inspection Procedures: On receipt of a request for inspection, the Owner's Representative will either proceed with inspection or advise the Contractor of unfilled requirements. The Owner's Representative will prepare the certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued. Results of the completed inspection will form the basis of requirements for final acceptance.

### **3.0 FINAL ACCEPTANCE**

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
3. Submit a copy of the Owner's Representative's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Owner' Representative.
4. Submit consent of surety to final payment. Submit final waiver of liens. Submit affidavits as required.
5. Submit a final liquidated damages settlement statement.
6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
7. Submit one-year guaranty of Work on Contractor's letterhead; guaranty shall commence on the date of final payment.

B. Reinspection Procedure: The Owner's Representative will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner's Representative. Upon completion of reinspection, the Owner's Representative will prepare a certificate of final acceptance, or advice the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

### **4.0 RECORD DOCUMENT SUBMITTALS**

A. General Requirements: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Owner's Representative's reference during normal working hours. Submittal of record drawings is a condition for final acceptance and payment.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings.

C. Record Specifications: Maintain one complete copy of the Contract Documents, including addenda, and one copy of other written construction documents such as Change Directives, Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the specifications and modifications. Upon completion of the Work, submit record specifications to the Owner's Representative for the Owner's records.

D. Miscellaneous Record Submittals: Refer to other specification sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Owner's Representative for the Owner's records.

## **5.0 FINAL CLEANING**

A. General Requirements: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

C. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

END OF SECTION

## SECTION 02000 – SITE CLEARING

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

A. General Requirements: This section includes furnishing all labor, materials, equipment, and all services necessary for any clearing, and/or clearing and grubbing required within the designated areas of operation. Contractor's layout of clearing limits is to be approved by Engineer.

B. Traffic Control: The Contractor shall be responsible for conducting all work in streets, roads and highways in accordance with any and all regulatory authorities' current requirements. As a minimum, for any work in State Highways, the Contractor shall meet the requirements of the Ohio Department of Transportation (ODOT).

### 2.0 CLEARING AND GRUBBING

A. Clearing: On all areas where grading, excavating or filling are to be done, and on all border areas, clearing shall consist of cutting, removal and disposal of all trees, snags, logs, brush, shrubs, debris and other objectionable material resting on or protruding above ground within the limits of grading.

B. Grubbing: Grubbing shall consist of the removal and disposal of stumps, roots, and other objectionable organic material within the limits of grading. Stumps shall be removed entirely. Roots and matted roots shall be grubbed out at least 18 inches below the existing surface.

C. Disposal of Materials: All materials removed as a result of clearing and grubbing operations shall be removed from and disposed of off-site unless otherwise directed by the Engineer. As directed by the Engineer, some materials may remain on site to provide microtopography and wildlife habitat. Burning on site may be allowed if approved by the local government agency and the Engineer.

D. Trees and Other Vegetation: Those trees, shrubs, sod and other vegetation that are indicated to be saved shall be carefully protected by construction fencing to the limits noted on site during construction operations. If the vegetation is damaged or destroyed due to the Contractor's negligence, it will be replaced in kind at the fair market value determined by the Owner and paid for by the Contractor.

### 3.0 CERTIFICATION

General Requirements: The clearing and grubbing operations shall be observed and approved by the Engineer prior to rough grading.

END OF SECTION

## SECTION 02010 – EARTHWORK

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions and Special Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

A. General Requirements: This section includes furnishing all labor, material, equipment, and all services necessary to complete the earthwork within the Project site including but not limited to street right-of-way, parking lots, trenches, fill and/or cut slopes as shown on the drawings and as herein specified. The scope of the Project shall include but not be limited to the following: Clearing and grubbing; Backfilling and compaction; Demolition of areas shown on drawings including but not limited to concrete, asphalt, walls, structures and pipe; Provide and place any additional material, if needed, to bring existing grades to new grades; Temporary drainage of site; Rock removal and replacement; Trenching for utilities and drainage.

B. Contractor Verification: The Contractor shall visit the job site prior to the submission of the proposal to verify the actual conditions with those shown on the working drawings.

C. Limitations & Tolerances: Excavation and earthwork under this Contract will be limited to rough grading the subgrade in accordance with plans, details and specifications. Rough grading shall be within 0.1 foot (one-tenth of a foot) plus or minus making allowances for topsoil, pavement surfacing, etc.

D. Intent of the Design Drawings: Particular attention shall be paid by the Contractor in the field to preparing the subgrade with respect to adjacent buildings. The intent of the plan drawings is to establish an overall scope for the Work. It is not the intent of these documents to establish finite control of exact finished subgrade elevations or exact location; but rather it is intended to allow the Contractor the dual flexibility of minimizing his Work to the maximum benefit of the Owner. The Engineer, acting as the Owner's representative, shall judge the successful progress of the Work based on certain qualifications. If the Contractor is unfaithful in his performance in fulfilling these qualifications, the Engineer shall have the right to require the Contractor to bring the Work in exact conformance with the Contract Documents.

E. Notification of Project Start: The Contractor shall notify the Engineer three (3) days prior to the beginning of grading operations.

F. Stockpiling of Topsoil: Topsoil shall be removed to its entire depth from all areas to be filled, excavated, or used for borrow and stockpiled at convenient upland locations approved by the Engineer.

G. Maintenance of Reference Points: All reference points, property markers, right-of-way markers, etc., shall be carefully maintained. If disturbed or destroyed, the Contractor shall accurately replace same at his expense. The cost of resetting any property pins shall be back charged to the Contractor at the rate of \$50.00 per pin.

H. Protection of Existing Utility Lines: Existing utility lines shall be protected from damage during construction operations, and shall be repaired to the satisfaction of the Owner or the Engineer at the Contractor's expense, if damaged.

I. Traffic Control: The Contractor shall be responsible for conducting all work in streets, roads, and highways in accordance with any and all regulatory authorities' current requirements. As a minimum, for any work in State Highways, the Contractor shall meet the requirements of ODOT.

J. Engineer's Certification: At the completion of rough grading, the Engineer shall observe and approve the grading.

## **2.0 TESTING**

A. Scheduling and Coordination: The Contractor shall schedule and coordinate soil testing with the Owner's independent geotechnical testing firm. One compaction test shall be completed for every 1,000 linear feet of berm and every 12-inch layer height. Also, one compaction test shall be completed for every 1,000 linear feet of cut-off trench and two compaction tests per core trench.

B. Additional Testing: Additional tests will be paid for by the Contractor for materials that do not meet the specifications.

## **3.0 STRIPPING**

General Requirements: The entire area within the limits of grading shall be excavated to a depth sufficient to remove all vegetable matter, sod, muck, rubbish and other unsuitable material. Topsoil material from stripping operations shall be placed separate from other excavated materials and piled free of roots, stones, and other undesirable material for use in fine grading operations.

## **4.0 STOCKPILING TOPSOIL**

General Requirements: Topsoil shall be removed to its entire depth from all areas to be filled, excavated, or used for borrow and stockpiled at convenient upland locations approved by the Engineer.

## **5.0 PLACING TOPSOIL**

General Requirements: Topsoil shall be placed on all shoulders, slopes, ditches and other earth areas to be seeded after grading. Topsoil shall be placed uniformly to a compacted depth of not less than 6" or as indicated in the drawings. Soil material shall be free from clods, rocks, roots and other objectionable materials, which might hinder subsequent seeding and/or mowing operations.

## **6.0 PREPARATION OF GROUND SURFACE FOR FILL**

General Requirements: Sloped ground surfaces steeper than 1 vertical to 3 horizontal on which fill is to be placed shall be plowed, stepped or benched, or broken up as directed, in such manner that the fill material will bond with the existing surface. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be required to obtain the compaction specified.

## **7.0 PROOF ROLLING PRIOR TO FILLING**

General Requirements: After any required clearing, grubbing and stripping of topsoil has been accomplished, and before beginning any earthwork operations, all areas to receive compacted fill may be proof rolled to detect any soft areas that may exist, if required by Engineer. A 4-wheel pneumatic tired roller of not less than 25 tons, or its equivalent, may be used for this operation if required by Engineer. At least 4 passes shall be made, 2 in each of the two directions at right angles. Any soft areas thus disclosed that do not harden up after successive passes of the roller shall be called to the attention of the Engineer. The Engineer may require the areas to be under cut and replaced with properly compacted material.

## **8.0 FILLING**

A. Embankments: Approved material removed from the excavation shall be used in forming the fill. Fill material shall be free from roots, other organic material and trash, and from stones having a maximum dimension greater than 6 inches. No frozen material will be permitted in the fill. Soil material for fill shall be placed in successive horizontal layers of not more than 6 inches in loose depth for the full width of the fill embankment cross section. Each layer of fill or embankment shall be compacted by rolling with an approved tamping roller, vibrating roller or other compaction equipment, whichever is best suited for the types of soil encountered.

B. Trenches: Place backfill in not more than 6-inch thick compacted lifts, except as specified otherwise. Each lift shall be compacted as specified hereinafter. Backfill adjacent to structural elements shall be placed, as far as practicable, as the adjacent structural elements have been completed and accepted. Backfilling against concrete shall be done only when directed by the Engineer. Backfilling of trenches shall progress as rapidly as the construction, testing and acceptance of the Work permits. In backfilling pipe trenches, compact fill in 6-inch thick compacted lifts to a depth of 12 inches over the top of the pipe; backfill and compact the remainder of the trench as specified hereinafter. For trenched excavation in paved areas, place the backfill in not more than 6 inch compacted lifts to the top of the trench. For trenches excavated in unpaved areas place and compact backfill in 12 inch compacted lifts to the top of the trench.

C. Compaction: Each layer of fill or embankment shall be compacted to not less than 90% of maximum density at optimum moisture content. The upper 18 inches of fill under roads and buildings shall be compacted to 98% of this Specification.

1. The method of test for maximum density shall be in accordance with ASTM D-698 (Standard Proctor Test). The material to be compacted shall be of the proper moisture content to obtain the prescribed density. Wetting or drying of the material and manipulation to secure uniform moisture content throughout each layer will be required.

2. When compaction is suspended for several days, before resuming operations, the existing soil surface shall be plowed if deemed necessary by the Engineer. No allowance in payment will be made for this plowing.

## **9.0 FIELD CONTROL OF FILLING OPERATIONS**

Testing: The Owner shall retain the services of a testing laboratory to perform all tests required under this section. In areas where the density of the fill or embankment is specified, field density tests will be performed in sufficient number to insure that the specified density is being obtained. Areas of the site in which testing reveals compaction below the specified density as stated hereinbefore shall be reworked by the Contractor until satisfactory to the Engineer. The cost of the initial test shall be paid for by the Owner unless other arrangements have been made; subsequent tests required as a result of improper compaction shall be paid for by the Contractor.

## **10.0 EXCAVATION**

A. General Requirements: Excavation of every description regardless of material encountered within the grading limits of the project shall be performed to the lines and grades indicated or necessary. Suitable excavated material shall be transported to and placed in upland fill areas within limits of the Work. Unsuitable and surplus excavation material not required for fill shall become the responsibility of the Contractor and shall be removed from the site or disposed of as directed. The construction, excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. When required, the Contractor shall provide temporary drains, ditches, pumps, drainage lines, or other equipment to intercept, divert, or remove water that may affect the prosecution or condition of the Work. Water shall be removed from the site to the satisfaction of the Engineer.

B. Classification: Excavation shall be classified as either "common excavation" or "rock excavation". "Rock excavation" shall be such material that cannot be removed by means other than by explosives or air hammers. Materials that can be removed by ripping shall not be considered "rock excavation". "Common excavation" shall include all types of materials that do not fall into the category of "rock excavation" as defined above. The Engineer shall determine classification of excavation. It shall be the Contractor's responsibility to notify the Engineer when rock excavation is encountered.

C. Contract Adjustment for Rock Excavation: The lump sum contract prices shall be based on the assumption that all excavation will be "common excavation". In the event rock is encountered, the lump sum contract prices shall be adjusted in accordance with the unit prices submitted in the proposal. It shall be the Contractor's responsibility to notify the Engineer when rock excavation is encountered. The Contractor will not be credited for any rock quantities removed before such notice is given and the Engineer confirms rock conditions.

D. Insurance for Blasting: If conditions are such that blasting or any use of explosives is required, the Contractor, prior to blasting, shall submit to the Engineer satisfactory evidence of blasting and explosive insurance in the amounts of bodily injury and property damage insurance required in the Contract Documents and shall provide to the satisfaction of the Engineer the experience and capability of the Contractor's organization to safely handle and perform such operations.

E. Qualifications and Safety for Blasting: Handling and storing of blasting materials shall be performed only by qualified persons skilled in such work. Adequate precautions shall be taken to prevent accidents, injury to persons or damage to property. Qualifications of blasting operation personnel and safety precautions shall be in full compliance with all codes governing such operations and shall be approved by the Engineer. Full responsibility for all blasting operations shall remain with the Contractor, and he shall make good any damage that may result.

F. Trenches: Excavate for trenches to depth indicated or required to establish indicated flow lines or invert elevations. Maintain uniform width required for particular item to be installed, including width to provide sample working room or as indicated. Rock shall be excavated to a depth of 6 inches below the invert and 12 inches on each side of all structures or utilities.

## **11.0 EXCESS MATERIAL AND BORROW**

A. Disposal of Excess Material: Any excess material from excavation shall be disposed of by the Contractor on site in locations directed by the Engineer or the Owner's Representative.

B. Dumped Material: The dump shall be uniformly piled, with top flattened and edge sloped to present a neat appearance and permit drainage. The dump area shall be seeded.

C. Approval of Fill Material: The Contractor shall furnish all material required for fill work. Fill material shall be approved by the Engineer prior to filling operations.

D. Offsite Borrow: When necessary to borrow material for filling, the Contractor shall obtain fill material from off-site unless directed by the Engineer.

E. Borrow Pits: Wherever the backfill of excavated areas or the placement of embankments or other fill requires specified material not available within the Work limits, or material in excess of suitable material available from the authorized excavations, such materials available shall be obtained from the Owner's property adjacent to the Work limits or as approved by the Engineer. This may require the opening of borrow pits. In such cases borrow areas will be designated by the Owner. In general, borrow pits shall be dispersed through the area designated by Owner and excavated no deeper than 24" unless otherwise approved by Engineer. Before a borrow pit is opened, the quality and suitability of the material to be obtained there from shall be approved by the Engineer. Borrow pits shall be excavated neatly so that the surfaces drain and slopes shall be left at 10 horizontal to 1 vertical.

F. Clearing and Grubbing for Borrow Pits: Borrow pits shall be properly cleared and grubbed in accordance with applicable provisions of Section 02000 and topsoil shall be removed as specified herein.

## 12.0 GRADING

A. General Requirements: Grading of all areas within the Project including excavated and fill sections and adjacent transition areas shall be reasonably smooth, compacted and free from irregular surface changes. On sloped areas (greater than 3:1), the Contractor shall use track equipment or other suitable equipment to compact the slope and produce ridges (scarify) parallel to the slope contour. The Contractor shall protect newly graded areas from action of the elements. Any settlement or washing that occurs prior to acceptance of the Work shall be repaired and grades re-established to required elevations and slopes. Fill to grade levels any areas where settlement occurs. This fill material shall be placed in accordance with the specifications as previously described.

B. Spreading of Topsoil: Topsoil shall be uniformly spread to a minimum depth of 6" or as indicated in the drawings over all earthen areas disturbed during construction.

## 13.0 DRAINAGE

General Requirements: Drainage, both temporary and permanent, shall be constructed and maintained during the performance of the Work. Existing drains, culverts, and ditches not interfering with new work shall be kept clean and operating during construction operations. The surface of unfinished fills shall be bladed smooth to a crown or grade at the conclusion of the day's work or before shutdown for any cause to permit water runoff. Fill that has become saturated with water because of improper drainage shall be removed to a depth determined by the Engineer. Such saturated fill shall be disposed of as directed by the Engineer, or reconditioned to conform to these specifications. The Contractor shall control grading so that ground is pitched to prevent water from running into excavated areas and provide all pumping required to keep excavated areas free of water. Should springs or running water be encountered in excavation, the Engineer shall be notified immediately. The Contractor shall provide free discharge of such water by providing trenching that shall drain to an appropriate point of disposal.

## 14.0 REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL

A. Definition: Unsuitable material shall be defined as any earth material unsatisfactory for construction purposes based on the judgment of the Engineer, which is in excess of that specified as stripping and encountered within the limits of grading.

B. Removal and Disposal: Removal of unsuitable material shall include complete removal and disposal, backfilling, compaction and shaping. All organic and otherwise objectionable materials removed as a result of stripping and removal of unsuitable material as described in this section shall become the responsibility of the Contractor and shall be removed from the site and/or disposed of as directed.

## 15.0 SUBGRADE ELEVATIONS

A. Finished Elevations: The grading elevations shown on the drawings are finished elevations.

B. Pavement Subgrade Elevations: In pavement sections, the subgrade elevations will be below finished elevations by the thickness of the paving.

## 16.0 EROSION AND SEDIMENTATION CONTROL

General Requirements: Erosion and sedimentation control measures as shown on the drawings shall be installed and operational prior to starting any work on the Project site.

END OF SECTION

## SECTION 02020 - EROSION CONTROL

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

General Requirements: The Work includes the provision of temporary erosion control measures to prevent the pollution of air, water, and land. Installation of temporary erosion control features shall be coordinated with the construction of permanent erosion control features to assure effective and continuous control of erosion.

### 2.0 CONSTRUCTION

A. Gravel Construction Entrance: Provide as indicated, a minimum of 6 inches thick, at points of vehicular entrance and exit on the construction site. Gravel shall be as specified in the ODOT, "Standard Specifications for Highway Construction", Item "304" for Aggregate Base Course.

B. Dust Suppression: Contractor shall provide a water truck as required to control dust.

C. Sediment Fence: Install fence as indicated in the drawings. Angle posts between 2 degrees and 20 degrees towards the potential silt load area. Do not attach filter fabric to trees. Secure filter fabric to the post and wire fabric using staples, wire, or hog rings. Imbed the filter fabric into the ground as indicated. Splice filter fabric into the ground as indicated. Splice filter fabric at the support pole using a 6-inch overlap and security seal. Top of the filter fabric shall have a 1-inch tuck or a reinforced top end section. Preassembled silt fences may be used as approved by the Engineer.

1. Posts: 4 inch by 4-inch wood posts, minimum 3-inch diameter wood, or 1.33 pound per linear foot steel posts. Posts shall be minimum 5 feet long.

2. Wire Fabric: ASTM A-185, 6 by 6, minimum 14 gage.

3. Filter Fabric: A woven or nonwoven polypropylene, nylon, or polyester containing stabilizers and/or inhibitors to make the fabric resistant to deterioration from ultraviolet light. Filter cloth shall be of the type recommended by its manufacturer for the intended application.

4. Straw Bales: The use of straw bales for sediment and erosion control shall not be permitted on this Project.

D. Gravel Dam and Silt Trap: Provide where indicated, adjusting dimensions as directed by the Engineer to fit grading and location.

1. Riprap: ODOT "Standard Specifications for Highway Construction", Item "601", Stone for Riprap and ranging in size from 3 inches to 6 inches.

2. Filter Stone: #4 Crushed Stone.

E. In Channel Sediment Control: Sediment produced within the stream channel during construction will be retained in the Work area. Sediment retention will be accomplished in accordance with the drawings and best management practices (Section 02090).

F. Erosion Control Matting: Use jute, excelsior or paper matting that has not been bleached or dyed. Provide matting in minimum 4-foot widths. Staples for anchoring the matting shall be minimum throat width of 1 inch, minimum length of 6 inches after forming. Place matting in the direction of the flow of water. The up channel matting end shall be placed in a narrow trench a minimum of 5 inches deep. Where one roll of matting ends and a second roll begins, the end of the upper roll shall be brought over the buried end of the second roll to provide a 6-inch overlap. Where matting widths are laid side by side, the overlap between matting shall be 4 inches. Provide check slots every 50 feet longitudinally in the matting. Construct check slots by providing a narrow

trench 5 inches deep and folding the matting down into the trench, across the bottom of the trench, and then back up the trench to the existing ground. Backfill and compact the trench using the excavated material from the trench. Staple matting ends, junctions, and check slots at 10 inches on center. Staple matting outer edges, overlaps and the center of each matting strip at 3 feet on center. Install excelsior matting with the woven fabric on top.

G. Temporary Seeding: Within 48 hours after attaining the grading increment specified herein, provide seeding on graded areas when any of the following conditions occur:

1. Grading operations stop for an anticipated duration of 30 days or more.
2. Provide on the slopes of cuts and fill slopes for every 5-foot increment of vertical height of the cut or fill.
3. When it is impossible or impractical to bring an area to finish grade so that permanent seeding operations can be performed without serious disturbance from additional grading.
4. When an immediate cover is required to minimize erosion, or when erosion has occurred. Contractor will be required to correct and re-seed any eroded areas prior to final acceptance.
5. Provide on erosion control devices constructed using soil materials.

H. Temporary Seeding Operations: Temporary seeding operations shall consist of the following:

1. Procedure: Loosen subgrade to a minimum depth of 4 inches. Uniformly apply the seed at the specified rates. Roll the seeded area after applying seed and fertilizer. Do not seed or fertilize when the Engineer determines conditions are unfavorable. Provide water to promote turf growth.
2. Seed: Provide and apply certified annual rye seed at 150 pounds per acre.

I. Maintenance and Inspection: Inspect erosion control devices every 7 days or after each rainfall greater than ½" and daily during prolonged rainfall. Remove sediment deposits after each rainfall or when sediment reaches approximately one-half the barrier height or storage capacity. Immediately repair damaged erosion control devices and damaged areas around and underneath the devices. Maintain erosion control devices to assure continued performance for their intended function. Modify the erosion control plan as required to control problem areas noticed after each inspection.

J. Clean Up: At the completion of the job, or when directed by the Engineer, erosion control devices shall be removed. Erosion control devices and areas immediately adjacent to the device shall be filled (where applicable), shaped to drain and to blend into the surrounding contours, and grassed or repaired as specified.

END OF SECTION

## SECTION 02030 – STORM DRAINAGE

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

A. General Requirements: This section includes furnishing all labor, materials, and equipment for the installation of all drainage lines, including headwalls, inlets, catchbasins, and other special appurtenances and structures as required for this Project, shown on the drawings and specified herein.

B. Pipe Layout and Elevations: The layout of underground lines and invert elevations at governing points are shown on the drawings.

C. Approval by Engineer Required Before Backfilling: All pipe in place shall have been approved by the Engineer before backfilling.

D. Invert Elevations: All grades shown as pipe elevations are to the bottom of inside of pipe, unless otherwise noted.

E. Connections and Changes in Direction: All connections and changes of direction shall be made at inlets as shown.

F. Material Specifications: Where more than one material for an item is specified, the material used shall be as noted on the drawings or specified elsewhere in the Contract Documents.

G. Traffic Control: The Contractor shall be responsible for conducting all work in streets, roads, and highways in accordance with any and all regulatory authorities' current requirements. As a minimum, for any work in state highways, the Contractor shall meet the requirements of the ODOT.

### 2.0 MATERIALS

A. General Requirements: All ASTM references shall be the latest version for the specific product.

B. Concrete: Concrete shall be 4000 psi mix using Portland Cement ASTM C-50 Type 1, sand ASTM C-33 and coarse aggregate ASTM C-33.

C. Rebar: Reinforcing bars shall conform to ASTM A 615, new billet steel, intermediate grade.

D. Water: Water shall be clean, free from oils, acids, alkalis, or organic or deleterious substances.

E. Reinforced Concrete Pipe (RCP): Reinforced concrete pipe shall be Tongue-and-Groove, Class III-Wall B, unless otherwise indicated on the drawings and shall conform to requirements of ASTM C-76.

F. Gray Iron Castings: Frames, solid covers and grates for drainage structures shall be gray iron conforming to ASTM A-48, size as indicated, free from blow holes, porosity, hard spots, shrinkage distortion or other defects, well cleaned and coated with asphalt paint which shall result in smooth coating, tough and tenacious when cold, not tacky and not brittle. Bearing surface between frame and cover or grate shall be machined to prevent rocking and rattling.

G. Steps: Steps for manholes and drainage structures more than 4 foot deep shall be manufacturer's standard, spaced and embedded per OSHA requirements and approved by the Engineer.

H. Welded Wire Fabric: Welded wire fabric shall conform to ASTM A-185.

I. Masonry: Masonry materials for drainage structures are detailed on plans as concrete brick. Concrete manhole block and precast sections are equally acceptable, subject to shop drawing approval by the Engineer.

1. Concrete Brick: Concrete brick for storm inlets and catchbasins shall be standard size, ASTM C-90, Class A.
2. Concrete Block: Concrete block for storm drainage manholes shall comply with ASTM C-139.
3. Precast Manholes: Precast concrete manhole sections shall be 4000 psi concrete, tongue and groove, steel fabric reinforced, cement mortar joints bitumastic sealed, in accordance with ASTM C-478. Precast manholes shall have a conical top, coursed with brick. Precast bottoms are permissible. Handling holes shall be plugged with mortar or stoppers.
4. Portland Cement: Portland cement shall be by an approved manufacturer, ASTM C-150, Type I.
5. Sand: Sand shall comply with ASTM C-144.
6. Lime: Lime shall be hydrated, ASTM C-207, Type N.
7. Water: Water for masonry materials shall be potable, free of suspended matter, injurious amounts of acids, or alkalis, and containing no industrial or domestic wastes.
8. Mortar: Mortar for drainage structures shall be 1 part Portland Cement, 10% hydrated lime, 2 parts sand by volume, mixed with sufficient water to form a plastic mortar.
9. Flexible Butyl Resin Sealant: Flexible Butyl Resin Sealant shall comply with AASHTO specification M-198 B, similar to Butyl Tite or ConSeal or approved equal.

J. PVC Pipe:

1. Polyvinyl Chloride (PVC) Pipe and Fittings (10-Inch Diameter and Smaller): ASTM D-3033 or ASTM D-3034, SDR 35, with ends suitable for either solvent cement or elastomeric gasket joints, as approved by Engineer.
2. Polyvinyl Chloride (PVC) Perforated Pipe and Fittings: ASTM D-2729 with one-half inch diameter holes 5 inches to 8 inches on center, 120 degrees apart.
3. High Density Polyethylene (HDPE) Pipe and Fittings (12-Inch Diameter and Larger): AASHTO M252, M294 and MP7 for manufacturing specifications on test methods, dimensions and markings and ASTM D3350 for cell classification. AASHTO Type "S" (N-12) designation shall be used for pipe sizes 4-42 inch and Type "D" (N-12HC) for pipe sizes 42-60 inch. Gaskets if specified shall meet the requirements of ASTM F477. Installation shall be in accordance with ASTM D2321.

K. Corrugated Aluminum Pipe and Fittings: Fed. Spec. WW-P-402 or AASHTO M-196, Class I or II, circular and arched; minimum thickness of metal shall be 18 gage.

L. Corrugated Steel Pipe and Fittings: Fed. Spec. WW-P-405 and AASHTO M-36, Class I or II, circular and arched. Minimum thickness of metal shall be 18 gage. Pipe with annular corrugations shall be fully bituminous coated, half paved, for pipe diameters 18 inches and less. Pipe with helical corrugations shall be fully bituminous coated for pipe diameters 18 inches and less. Pipe larger than 18 inches diameter shall be fully bituminous coated and fully paved. Helically corrugated pipe and fittings, when used with pipe joints, shall have a minimum of two factory-rolled annular corrugations at each end.

M. Corrugated Metal Watertight Joints: Fed. Spec. WW-P-405 for steel pipe and WW-P-402 for aluminum pipe. The circumference of the coupling bands shall be provided with a 3-inch lap minimum. For tightening each coupling band, provide four 1/2 inch galvanized steel bolts. Gaskets shall be cylindrical in shape, fabricated of 3/8 inch thick by 6-1/2 inch minimum width rubber conforming to ASTM D-1056. Diameter of cylindrical gasket shall be 10 percent less than the nominal pipe diameter. On riveted pipe and fittings, omit the longitudinal seam rivets that would be under the coupling band and weld that portion of the seam. Coupling bands shall be of one or two-piece construction and bituminous coated when specified for the pipe.

N. Filter Fabric: Woven or nonwoven polypropylene, nylon or polyester containing stabilizers and/or inhibitors to make the fabric resistant to deterioration from ultraviolet light. Filter cloth shall be of the type recommended by its manufacturer for the intended application.

O. Coarse Aggregate: The aggregate shall consist of crushed stone or gravel conforming to ODOT "Standard Specifications for Highway Construction", Item 815 and approved by Engineer.

P. Rip Rap:

1. Material Quality: Stones shall be hard quarry of field stone and shall be of such quality that they will not disintegrate on exposure to water weathering. The stone shall be suitable in all respects for the purpose intended and shall conform with ODOT "Standard Specifications for Highway Construction", Section 601 except as modified herein.

2. Hand Placed Rip Rap: Stone for hand placing to a thickness of 12 inches shall range in weight from a minimum of 25 pounds to a maximum of 150 pounds. At least 50 percent of the stone pieces shall weigh more than 60 pounds. The stone pieces, except spalls, shall have a minimum dimension of at least 12 inches. Stone for hand placing to a thickness of 6 inches shall be no less than 3 inches in one dimension and no less than 6 inches in another dimension.

3. Dumped Rip Rap: Stone used in dumped rip rap shall be a quarried stone of reasonably uniform grading from the larger to the smaller pieces with the larger pieces preferably not above 24 inches in size.

4. Grouted Rip Rap: Grouted rip rap stone shall conform to the requirements for hand placed rip rap. The mortar for grout shall be composed of one part Portland cement and three parts sand. The water content of the grout shall be such as to permit gravity flow into the interstices or voids with limited spading and brooming.

Q. Water Control Structure: Provide Agri Drain Inline Water Level Control Structure™ with locking lid or approved equal in dimensions set forth in the drawings and/or details. Available from Agri Drain Corporation, Telephone 1-800-232-4742 or 1-641-742-5211. Website: [www.agridrain.com](http://www.agridrain.com).

### **3.0 PIPE TRENCH EXCAVATION**

A. Classification: Excavation shall be classified as "Common Excavation" or "Rock Excavation" as defined in Section 02010. Base bid shall be based on "Common Excavation" in trenches.

B. Required Trench Dimensions: The trench shall be excavated by an approved method, to a depth to permit installation of the pipe along the lines and grades shown on the drawings. All side slopes for trench excavations shall be sloped by the Contractor to provide for safe working conditions by all personnel. The width of the trench shall be sufficient to allow thorough compacting of the backfill under and around the pipe. Where rock is encountered, the rock shall be removed to a depth below grade of at least 6 inches, and the trench shall be refilled to grade with earth, sand, gravel, crushed stone or other suitable material as per the details on the drawings, firmly compacted to provide proper bedding for the pipe. Payment for rock will be to a depth of 6 inches below the invert and 12 inches on each side of the outside wall of the pipe.

C. Removal of Unsuitable Material: If directed by the Engineer, soft, mucky, or otherwise unstable or unsuitable material in the trench bottom shall be removed and replaced with crushed stone, or stabilized with crushed stone.

D. Notification of Rock Excavation: The Contractor shall notify the Engineer immediately if "Rock Excavation" is encountered. Rock removal or backfill shall not proceed until directed by the Engineer. Section 02010, Article 10 Excavation shall apply to "Rock Excavation" in trenches.

### **4.0 BRACING AND SHEETING**

General Requirements: The sides of all trenches and excavations shall be adequately braced and sheeted to protect personnel, structures and property from slides, cave-ins, or settlement and to maintain the Work clear of all obstructions. Bracing, shoring and sheeting shall comply with all applicable safety regulations governing the Work. Full responsibility for the design, type and strength of shoring, sheeting and bracing shall rest with the Contractor.

## **5.0 DE-WATERING**

General Requirements: The Contractor shall do all pumping necessary for dewatering trenches and to provide safe, proper work conditions for installation of pipe and appurtenances. Pipe shall be installed on dry, stable trench bottoms.

## **6.0 BACKFILLING**

A. General Requirements: Immediately after the pipes have been laid and approved, the trench shall be backfilled around the barrel of the pipe with fine materials, free from large stones deposited in level layers no more than 6 inches in depth, each layer to be thoroughly tamped and compacted before the next layer is deposited. Care should be exercised to avoid any wedging action or eccentric action upon or against any pipe or structure and to avoid any disturbance or damage to the Work.

B. Backfilling in Traffic Areas: In roads, across sidewalks and driveways and at other places subject to vehicular traffic or other superimposed loads, trench backfilling material as specified above shall be compacted in 6 inch layers for the full depth of the trench and consolidated in such a manner to provide an unyielding foundation for vehicular traffic. Unless otherwise shown on the plans or required by governing authorities, the compaction density shall be equal to the density of the original adjacent material. However, the minimum compaction density shall be 95% of maximum density according to ASTM D-698, except that the upper 18 inches under the roadway and parking lots shall be compacted to 100% of maximum density.

C. Backfilling in Other Areas Subject to Superimposed Loads: Material for the lower portion of the trench, above required pipe bedding material, shall consist of fine, loose earth, free of large clods, stones, vegetable matter, debris, and/or other objectionable material. It shall have moisture content suitable for thorough compaction. It shall be deposited in horizontal layers not to exceed 6 inches in thickness (before compaction) on each side of the pipe. Each layer shall be thoroughly tamped or ramed around the pipe with approved hand or power driven tools until enough material has been placed and compacted to provide a cover of not less than 18 inches over the top of the pipe. Minimum compaction shall be 95% of maximum density according to ASTM D-698.

D. Backfilling in Areas Not Subject to Superimposed Loads: In all other areas not subject to superimposed loads, trench backfill may be placed from the level 18 inches above the top of the pipe upward in 12 inch layers with light compaction by mechanical tampers, and without damage to the pipe. Such backfill may contain coarser material than specified in article 6 I above, but shall be free from brush, trash, perishable matter, or stones larger than 6 inches in any dimension.

E. Maximum Stone Size: No rock or boulders shall be used in the backfill for at least 1 foot above the top of the pipe and in the upper 18 inches. No stone larger than 6 inches in its greatest dimension shall be used in the backfilling.

F. Insufficient Fill Quantity: Any deficiency in the quantity of material for backfilling the trenches, or for filling depressions caused by settlement, shall be supplied by the Contractor as part of the Scope of Work or warranty.

## **7.0 DRAINAGE LINE CONSTRUCTION**

### A. Installation of Pipe:

1. General Requirements: Under no circumstances shall pipe be laid in water, on rock, or when trench conditions or weather are unsafe or unsuitable for such work. Each pipe shall be carefully examined before being laid, and any defective or damaged pipe shall be removed from the site. Proper equipment shall be provided for lowering sections of pipe into trenches. The pipe shall be laid true to line and grade, beginning at

the lowest point with the spigot end pointing in the direction of flow, with uniform bearing upon the pipe bed for the full length of its barrel. Raising the pipe off the subgrade (bridging) to obtain the proper elevation will not be allowed. Each section shall be securely attached to the adjoining sections by the method required for the type of joint used. When laying concrete pipe, all joints shall be thoroughly wetted with water and then filled with a stiff mortar composed of one part Portland cement and two parts sand. The mortar shall be placed so as to form a durable watertight joint. The lower portion of the hub or groove of each section of pipe laid shall be thoroughly wetted and plastered on the inside with cement mortar of sufficient thickness to bring the inner surfaces of the abutting pipes flush and even. As each section of the pipe is put in place, the remainder of the joint so formed shall be thoroughly wetted and filled with mortar, and sufficient additional mortar shall be used to form a bead along the outside of the joint. The inside of the joint shall be wiped and finished smoothly. After the initial set, the mortar on the outside shall be protected from the air and sun with thoroughly wetted earth or burlap cover.

2. **Optional Joint Sealant:** As an option, each joint connection of pipe shall be made watertight using a flexible Butyl Resin Sealant according to the manufacturer's specification.

3. **Reinstallation of Substandard Pipe:** Any pipe that is not in true alignment, is damaged, or which shows undue settlement after laying shall be removed and reinstalled without extra compensation.

4. **Joint and Fitting Installation:** Pipe joints and fittings shall be made up in strict accordance with the manufacturer's directions.

5. **Laser Alignment Control:** Laser beams shall be used for grading pipe trenches and placing pipe.

#### **B. Drainage Structures:**

1. **General Requirements:** Drainage structures shall be constructed as shown on the drawings, walls of brick, plumb and true, bottoms of concrete.

2. **Brickwork:** All brick shall be wet before being laid in warm weather. Brick shall not be laid in freezing weather. The Contractor shall protect all brickwork from the weather when storming or freezing and at all times when necessary during the progress of the Work.

3. **Setting Frames:** Cast iron frames shall be set in a full bed of mortar and to the elevation established by the Engineer.

4. **Backfilling:** Backfilling around drainage structures shall be accomplished by methods and requirements as specified for backfilling pipe trenches.

#### **C. Headwalls:**

1. **General Requirements:** Headwalls shall be constructed at locations indicated on the drawings, with the headwall details. Concrete and reinforcing bars shall be as specified.

#### **D. Subdrain System:**

1. **Procedure:** Refill excavations cut below indicated depth with granular fill during placement of granular fill. Trenches for underdrain shall be excavated to a width equal to 3 times the outside diameter of the pipe and to a depth as required to lay the pipe at the desired grade. Provide granular fill a minimum of one pipe diameter on each side of the pipe and on the bottom of the pipe. Place in 6-inch lifts up to the level indicated or directed by the Engineer. The pipe shall be placed in the center of the trench and bedded firmly on the bottom course of aggregate. If bell and spigot type is used, the bell end shall be laid upstream. Perforated pipe shall be laid with the perforations on the underside of the pipe. Lateral connections shall be made with suitable tee, wye, bend, reducer, or increaser fittings as required. The upstream end not terminating in a structure shall be capped, plugged, or fitted as directed by the Engineer.

2. **Wrapping Perforated Pipe:** Wrap PVC perforated pipe when indicated, with one layer of filter cloth, overlapping 6 inches at the longitudinal joint of the filter cloth. Wrap the filter cloth such that the edge of the outer layer points towards the bottom of the trench at the longitudinal joint and is in direct contact with the inner

layer of the filter cloth. Obtain approval of filter cloth installation before placing fill. Place fill in a manner to prevent filter cloth damage or displacement.

3. Wrapping Drainage Trench: Provide a layer of filter cloth around the perimeter of the drainage trench. Filter cloth joints placed on the side of the drainage trench shall have the inner layer of filter cloth pointing towards the bottom of the trench. Unless specified otherwise, overlap filter cloth at joint a minimum of 1 foot. Repair damaged filter cloth by placing an additional layer of filter cloth over the damaged area, overlapping 1 foot in all directions.

#### E. Placing Rip Rap:

1. Hand Placed Rip Rap: The thickness of hand placed rip rap shall be no less than that specified, measured perpendicular to the slope. The slope upon which this rip rap is to be placed shall conform to the cross section shown on the drawings or as directed by the Engineer. Depressions that may be filled in trimming and shaping shall be properly compacted. Rip rap shall be firmly imbedded against the slope and the adjoining piece with the sides in contact and with well-broken joints. The spaces between the larger pieces shall be filled with spalls of suitable size that shall be thoroughly rammed into place. The finished surface shall present an even, tight surface true to line, grade and section.

2. Dumped Rip Rap: Before placing of rip rap, the slopes and foundation trenches shall be constructed as necessary. The stone shall be handled or dumped into place so as to produce a compact, well-graded mass with a minimum percentage of voids. The material shall be placed to its full course thickness of 2 feet minimum, measured perpendicular to the slope, in one operation and in such manner that the slopes will be disturbed as little as possible. The larger pieces shall be well distributed and the finished layer of rock shall contain no segregated pockets of small pieces or groups of large pieces that would cause large open voids. Rearranging of the individual pieces by mechanical equipment, or by hand, may be required to the extent necessary to obtain a reasonably well graded distribution of sizes as specified above. The surface of the completed rip rap shall be reasonably uniform in appearance, free from excessive humps or depressions.

3. Grouted Rip Rap: The aggregate and method of placing the rip rap for grouted rip rap shall be as specified for hand placed rip rap. After the rip rap has been placed and approved, all interstices or voids between the stone shall be filled with mortar to a depth of not less than 4 inches below the surface of the stone. The face or surface of the stones shall be left reasonably free of grout. Plastering of the rip rap will not be permitted. The spaces between the stones shall be reasonably free of sand or other material and shall be wet during the placing of the grout.

#### F. Cleaning, Inspection and Testing:

1. General Requirements: All storm lines and drainage structures upon completion or at such time as directed shall be cleaned, inspected, and tested. The storm drain system shall have a true grade and line and shall be entirely clean and ready for use.

### **8.0 SITE CLEAN UP**

General Requirements: The Contractor shall remove all excess material from excavations to points designated by the Engineer, and clean the site of the Work of all debris collected during the construction.

END OF SECTION

## SECTION 02040 – GENERAL SEEDING

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

General Requirements: Provide seedbed preparation, topsoiling, and seeding and/or reseeding and repair of all disturbed areas, unless indicated otherwise.

### 2.0 MATERIALS

A. Seed: Deliver seed to the site in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, weed seed content, and inert material. Label in conformance with USDA Federal Seed Act and applicable State seed laws. Wet moldy, or otherwise damaged seed will be rejected. Seed shall be State-certified seed and of the latest season's crop. Mix seed according to the mixture shown on the drawings or specifications.

### 3.0 SEEDING

A. Storage and Handling: Store seed in dry locations away from contaminants. Protect seed from drying out. Do not drop or dump materials from vehicles.

B. Soil Preparation for Disturbed Areas: At the completion of rough grading, spread topsoil over areas to be seeded or as indicated, to a minimum thickness of 6 inches or as indicated in the drawings. Topsoil shall be the material stripped from the site during the grading operations. Do not spread topsoil when frozen or excessively wet or dry. Prepare the seedbed by discing or tilling, as directed by the Engineer. Areas not receiving topsoil shall be loosened to a minimum depth of 6 inches before agricultural lime, fertilizer, or seed is applied. Berm areas shall be fine graded to a smooth, positively draining slope, removing all stones over one inch.

C. General Seeding Conditions: Seed shall be sown within 24 hours following the application of fertilizer and lime, and preparation of the seedbed. Seedbed preparation is to be approved by Engineer. Do not seed when the ground is muddy, frozen, snow covered, or in any unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Engineer stating the special conditions and proposed variance. Use certified annual rye or seed specified by Engineer at the rate specified.

D. General Seeding Methods: Sow seed with approved sowing equipment using one or a combination of the following methods at the rate shown on the drawings or specifications. Sow 1/2 the seed in one direction, and sow the remainder at right angles to the first sowing, or, if not possible, divide the seed into halves and sow separately to assure uniform coverage.

1. Drill Seeding: Use cultipacker seeders or grass seed drills. Drill seed uniformly to a maximum depth of 1/4 inch. Cover seed by spiketooth harrow, cultipacker, or other approved devices.

2. Broadcast Seeding and Drop Seeding: Use broadcast or drop seeders. Cover seed uniformly to a maximum depth of 1/4 inch. Cover seed by spiketooth harrow, raking, or other approved devices.

E. Hydraulic Seeding: Hydraulic seeding is the application of a combination of seed, fertilizer and mulch in a slurry mixture. Rates of application, weight specifications and seed mixtures shall be as shown in the drawings or specifications. Seeding mixtures shall be prepared at the Project site and applied immediately. No seed/mulch mix that has been left in the seeder more than eight (8) hours shall be used. Mulching material shall consist of prepared wood cellulose manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. Mulching material shall mix readily and uniformly under agitation with water and blend with seed and fertilizer to form a homogeneous slurry. The fiber material shall be certified to contain no germination or growth-inhibiting factors, and shall be dyed (non-toxic) an appropriate color to

facilitate visual inspection of the uniformity of the application. The Contractor may substitute a cellulose fiber mulch consisting of recycled paper products, if manufactured particularly for application by hydraulic seeding equipment, and if the fiber meets all conditions specified.

The hydraulic equipment shall have a built-in agitating system with an operating capacity sufficient to agitate, suspend and homogeneously mix slurry of the specified amount of fiber, fertilizer, seed and water. The slurry tank shall have a minimum capacity of 1000 gallons. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with hydraulic spray nozzles that will provide even distribution of slurry on the various areas to be seeded. The materials shall be combined in accordance with the manufacturer's guidelines. Use an organic liquid binder that has been approved by Engineer and apply at a uniform rate in accordance with the manufacturer's guidelines. Using the color of the mulch as a guide, the Contractor shall spray the areas to be seeded with a uniform visible coat, at the rates and the amounts specified. The slurry is generally applied in a sweeping motion, in an arched stream, allowing the mulch to build upon itself until an even coat is achieved.

Use certified annual rye or seeds specified by Engineer at the rate specified. Hydraulic seeding methods can be used for temporary seeding of all disturbed areas, and can also be used for re-seeding the temporary access drives and other areas used for access that are expected to be damaged by the Contractor's equipment. Apply mulch and fertilizer as indicated below:

<b>Amendment</b>	<b>Application Rate (pounds per acre)</b>
Fertilizer	None
Mulch	None

F. Protection of Seeded Areas: Immediately after seeding, protect the area against traffic or other use by erecting barricades, as required, and placing approved signs at appropriate intervals until final acceptance.

**4.0 FINAL INSPECTION**

A. Final Inspection and Acceptance: Final inspection will be made upon written request at least 10 days prior to the anticipated date. Final acceptance will be based upon a satisfactory stand of vegetation, defined as 95 percent ground cover of the specified species. The Contractor will repair any bare spots over 2 inches square due to uneven seed distribution, drought or specified planting dates.

B. Reseeding and Repair: Any areas that require reseeding and/or refertilization will be designated by the Engineer. If damage occurs following seeding or if seedlings are destroyed, the portion affected shall be repaired to re-establishment condition and grade of the soil prior to original seeding, and then reseeded following the above specifications.

END OF SECTION

## SECTION 02055 – WETLAND RESTORATION STRUCTURES

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

A. General Requirements: Structures promote the restoration of wetlands that trap, impede or pond surface water and can provide habitat for vegetation and wildlife. Berms help to restore wetlands by decreasing surface water runoff, increasing infiltration into the ground and prolonging the hydroperiod and length of time water is stored above and below the ground. Soil water and shallow water storage are often important sources of water during growing season dry spells. Terraces are relatively flat, broad land surfaces constructed on nearly level to gently sloping land to restore wetlands by slowing or impeding surface water runoff. Dead furrows and hummocks work together with terraces and low berms to replace some of the natural functions that once helped control runoff and erosion in similar landscapes. On land without vegetation, these structures simulate the lost natural functions attributed to vegetation cover and rough topography that decreased runoff from the land, increased the infiltration of water into the soil and back to the water table, and provided shallow water storage and habitat. For example, forest cover and the rough land surface often created by up-rooted trees will slow surface water runoff and promote infiltration to the soil. Low berms, terraces, dead furrows and/or constructed hummocks help to replace these lost functions and provide important microhabitat sites to promote vertical vegetation structure and wildlife habitat. Woodland vernal pools and depressional seasonal wetlands are shallow depressions located in or near forests, usually flooded in the winter and spring, and dried up in the summer. These pools provide essential habitat functions for wildlife, including breeding, rearing, foraging and basking habitat for amphibians, reptiles and macroinvertebrates. The Work shall consist of installing vernal pools, depressional seasonal wetlands, berms, terraces and dead furrows/hummocks at the locations shown and in accordance with the drawings and/or details. The locations shown in the drawings may be adjusted in the field by the Engineer.

B. Materials: Pools, berms, terraces and dead furrows/hummocks will be constructed or shaped using existing materials at the site of the Work.

### 2.0 CONSTRUCTION

A. General Requirements: Construction of the wetland restoration structures shall be as shown on the drawings and/or details and as directed by the Engineer. Construction must be accomplished in accordance with best management practices (Section 02090) and in the sequence specified by the Engineer.

B. Berms: Berms are to be constructed in accordance with the drawings and/or details at the locations shown or designated by the Engineer on site. Typically the berms will be constructed using backhoe, bulldozer and trencher. Generally, the stripping of topsoil for berm construction should be limited to an area no wider than twenty-five (25) feet. Trenching for tile will be to a depth of  $\pm 4$  feet. (When discovered, tile shall be removed or decommissioned as indicated in the drawings or plan notes.) Specifications for earthwork, including borrow, compaction and testing are set forth in Section 02010. Berms will typically be constructed to a height of 1 foot to 4 feet and to as narrow a width as possible ( $\pm 8$  feet top width), unless the berm will be used for a trail ( $\pm 12$  feet top width). Fine grading should be limited to the tops and cut slopes of the berms, not extending beyond the toe of the slopes. Berm seeding will be as specified in Sections 02040 and/or 02085.

C. Terraces: Terraces are to be constructed in accordance with the drawings and/or details at the locations shown or designated by the Engineer on site. Typically the terrace will be constructed with a bulldozer or a scraper (pan). Terraces do not require excavation, trenching or compaction, although trenching may be required to decommission tile in some instances. Topsoil should not be stripped in the area of terrace construction, but in some circumstances, vegetation should be scalped or mowed to a height of approximately  $\frac{1}{2}$  inch or less prior to terrace construction. Generally, terraces will be constructed to a height of 0.5 foot. Avoid the construction of a high wall and do not fine grade terraces. Terrace seeding will be as specified in Section 02085.

D. Dead Furrows/Hummocks: Dead furrows/hummocks will be constructed (shaped) in accordance with the drawings and/or details at the locations shown or designated by the Engineer on site. The dead furrow/hummock should be shaped to create a combination of high and low points that will retain water, but not create a channel that will drain water from the area. The shaping techniques will vary based on site conditions and soils. Acceptable methods include the use of (1) a bulldozer with teeth,  $\pm 12$  inches long, to groove the soil; (2) a rubber-tired backhoe to drive over cohesive wet or muddy soil to rut the soil; and (3) a plow/cultivator to a depth of  $\pm 12$  inches to furrow the soil. The Engineer and/or Owner's Representative will specify the techniques appropriate for conditions at the site of the Work and may require modifications or weight limits to Contractor's equipment to reduce impacts at the site. Dead furrow/hummock seeding will be as specified in Section 02085.

E. Woodland Vernal Pools/Depressional Seasonal Wetlands: Woodland vernal pools and depressional seasonal wetlands will be constructed in accordance with the drawings and/or details at the locations shown or designated by the Engineer on site. For woodland vernal pools, avoid contact with existing trees and their root systems. In general, constructing the pools requires laying out the footprint, setting aside leaf litter, woody debris and topsoil, and carefully excavating a depression or basin. After the depression has been excavated to the desirable footprint and depths, the topsoil, woody debris and leaf litter are replaced. Woody debris and leaf litter sourced from adjacent forest areas will be added to the depressional seasonal wetlands constructed in the meadow habitats. The woodland vernal pools' footprints have irregular shapes, depths generally less than 2 feet, with a few small, deep holes not exceeding 3 feet in depth. At least 50% of the edge (perimeter) should be sloped to 1:15. The depressional seasonal wetlands will include one or more deep holes (basins) exceeding 3 feet in depth. Any drain tiles encountered in the process of constructing the pools shall be decommissioned. In accordance with the general seeding specifications, topsoil should be spread to a minimum thickness of 6 inches. Vernal pool seeding will be as specified in Section 02085.

END OF SECTION

## SECTION 02085 – SEED MATRICES AND VEGETATION SPECIES

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

- A. General Requirements: The Contractor shall provide the seeds specified, in the quantities and/or at the rate specified, and mixed in the proportions specified. Seeds shall be free of species not included in the specifications. All plant materials, shipments and deliveries shall comply with federal, state and local requirements governing the inspection, shipping, selling and handling of plant stock. Plant materials shall be inspected, as may be required, for injurious insects, plant diseases and plant pests with inspection certificates, or copies, accompanying each shipment and/or delivery. The name and location of the source of plant materials shall be included with plant labels.
- B. Installation of Seeds: The Contractor shall install seed during the fall, as specified by the Owner's Representative and as shown in the drawings. The location of specified seed matrices may be adjusted in the field by the Owner's Representative. All seed matrices will be seeded by hand or with a drop seeder or broadcast seeder at the rates specified. Sow seed with approved sowing equipment at the rate (pounds per acre) shown on the drawings or specifications. Sow 1/2 the seed in one direction, and sow the remainder at right angles to the first sowing. When seeding by hand, drop seeder or broadcast seeder, cover seed uniformly to a maximum depth of 0-1/4 inch.
- C. Plant Species: The Contractor must use the plant species from the lists set forth below in the quantities specified by the Owner's Representative. The plants are to be provided as bare root or containerized saplings, installed in the locations and at the time of year specified by the Owner's Representative.
- D. Handling and Planting of Bare Root Saplings: Saplings should be handled carefully to avoid damage. Plants must not be allowed to dry out. Carry saplings in a bucket with moist peat moss. Bare root shrubs should be planted in an upright position when viewed from two directions, to the same depth as originally grown. Plant into a hole 6" deeper than and as wide as the existing roots. Backfill the soil into the hole, firm the soil to prevent the creation of air pockets or voids, and avoid over-compressing or tramping soil. If settling occurs more soil must be added to the planting site to bring it up to the surrounding substrate.

Handling and Planting of Containerized Saplings: Saplings should be handled carefully to avoid damage. Plants must not be allowed to dry out. Containerized shrubs should be transplanted to the same depth as originally grown. Backfill the soil into the hole to the soil level of the container and avoid over-compressing or tramping soil.

### 2.0 SEED REQUIREMENTS

A. General Requirements: All seeds shall be true to botanical name; no plant cultivars shall be accepted. Owner's Representative must approve substitutions in advance. Substitutions must meet the following requirements: native to Lorain County or Erie Lake Plain ecoregion in Ohio; similar wetland indicator status; same or higher C of C; substituted species shall not make up more than 5% by weight of any matrix.

Within thirty days after the Contract is executed, a written description of the seed providing the percentage by weight for each species shall be submitted to Owner's Representative for approval. The description shall also include: name and location of the seed supplier; origin of each species or lot; and a statement of the purity and germination of each species. This information shall also be included on all seed package labels. Seeds shall be packed and handled in an appropriate manner to provide protection against damage. Seed shall be appropriately stored to preserve viability and at a temperature less than 65°F and at 25% humidity. Owner's Representative reserves the right to inspect all seeds before they are mixed. The Owner's Representative also reserves the right to inspect and reject damaged or otherwise unacceptable seeds after delivery. The Contractor at its expense shall replace damaged or otherwise unacceptable seeds.

B. Grasses Requirements: Seed mixes shall be mixed according to PLS weight. Seed mixes shall be approved by Owner's Representative. All legumes shall be inoculated at the appropriate time with the proper species-specific rhizobia.

C. Forbs Requirements: Seed mixes shall be mixed according to bulk weight. Seed mixes shall be approved by Owner's Representative. Seed counts indicated per acre mean the total of pure live seed (PLS). Contractor shall provide for testing of seed not supplied with purity and germination data at its expense by a testing facility approved by the Owner's Representative. The test date shall be within 9 months of the planting date.

### 3.0 SOURCES

Nonexclusive Sources: Nonexclusive sources for seed and saplings are listed below:

Ernst Conservation Seeds 8884 Mercer Pike Meadville, PA 16335 (800) 873-3321	Ion Exchange 1878 Old Mission Drive Harper's Ferry, IA 52146 (563) 535-7231	Ohio Prairie Nursery, Ltd. P. O. Box 174 Hiram, OH 44234 (866) 569-3880
Prairie Moon Nursery Route 3, Box 163 Winona, MN 55987 (507) 452-1362	Prairie Nursery P.O. Box 306 Westfield, WI 53964 (800) 476-9453	Spence Restoration Nursery P.O. Box 546 Muncie, IN 47308 (765) 286-7154
Riverside Native Trees 2295 River Road Delaware, OH 43015 (740) 815-3230	Alpha Nurseries 3737 65 <sup>th</sup> Street Holland, MI 49423 (269) 857-7804	Woody Warehouse Nursery, Inc. 3216 W 850 N Lizton, IN 46149 (317) 994-5487

### 4.0 SEED MIXTURES

<b>Mixed Shade</b>		<b>ACRES: 1</b>						
<b>Scientific Name</b>	<b>Common Name</b>	<b>Form</b>	<b>CoC</b>	<b>Ind-OH</b>	<b>AMT (oz)</b>	<b>Seeds/ SQ FT</b>		
<i>Caltha palustris</i>	Marsh Marigold	F	6	OBL	3	1.79		
<i>Chelone glabra</i>	Turtlehead	F	6	OBL	1	2.11		
<i>Coreopsis tripteris</i>	Tall Coreopsis	F	5	FAC	4	1.29		
<i>Eupatorium fistulosum</i>	Joe Pye Weed	F	6	FACW	1	2.87		
<i>Eupatorium purpureum</i>	Sweet Joe Pye Weed	F	5	FAC	2	1.93		
<i>Helianthus giganteus</i>	Giant Sunflower	F	6	FACW	4	0.92		
<i>Iris virginica</i>	Southern Blue Flag	F	6	OBL	28	0.64		
<i>Iris versicolor</i>	Northern Blue Flag	F	6	OBL	4	0.12		
<i>Lobelia cardinalis</i>	Cardinal Flower	F	5	OBL	1	9.18		
<i>Lobelia siphilitica</i>	Great Blue Lobelia	F	3	FACW	0.125	1.43		
<i>Lycopus americanus</i>	Water Horehound	F	3	OBL	0.25	0.75		
<i>Mimulus ringens</i>	Monkey Flower	F	4	OBL	0.0625	3.30		
<i>Pedicularis lanceolata</i>	Marsh Betony	F	8	FACW	1	1.01		
<i>Pycnanthemum virginianum</i>	Mountain Mint	F	4	FACW	1	5.05		
<i>Rudbeckia laciniata</i>	Green-headed Coneflower	F	6	FACW	4	1.29		
<i>Rumex verticillatus</i>	Swamp Dock	F	6	OBL	2	0.44		
<i>Saururus cernuus</i>	Lizard's Tail	F	8	OBL	0.5	3.90		
<i>Senecio aureus</i>	Golden Ragwort	F	4	FACW	0.5	0.84		
<i>Verbena hastata</i>	Blue Vervain	F	4	FACW	0.5	1.07		
					58.4375	39.94		
<b>Scientific Name</b>	<b>Common Name</b>	<b>Form</b>	<b>CoC</b>	<b>Ind-OH</b>	<b>AMT (oz)</b>	<b>Seeds/ SQ FT</b>		

**SQ FT**

<i>Bromus latiglumis</i>	Ear-leaved Brome	G	6	FACW	2	0.35
<i>Calamagrostis canadensis</i>	Blue Joint Grass	G	4	OBL	1	6.43
<i>Carex comosa</i>	Bristly Sedge	G	2	OBL	1	0.69
<i>Carex crinita</i>	Fringed Sedge	G	3	OBL	1	0.53
<i>Carex gracillima</i>	Graceful Sedge	G	4	FACU	0.25	0.59
<i>Carex grayii</i>	Common Bur Sedge	G	5	FACW	6	0.17
<i>Carex intumescens</i>	Bladder Sedge	G	5	FACW	4	0.10
<i>Carex lacustris</i>	Lake Sedge	G	5	OBL	1	0.73
<i>Carex lupulina</i>	Common Hop Sedge	G	3	OBL	2	0.15
<i>Carex lurida</i>	Sallow Sedge	G	3	OBL	2	0.55
<i>Carex normalis</i>	Spreading Oval Sedge	G	4	FACW	0.5	0.29
<i>Carex pellita</i>	Wooly Sedge	G	6	OBL	0.25	0.16
<i>Carex scoparia</i>	Lance-fruited Oval Sedge	G	3	FACW	1	1.93
<i>Carex squarrosa</i>	Squarrose Sedge	G	4	OBL	4	2.30
<i>Carex stipata</i>	Common Fox Sedge	G	2	OBL	1	0.78
<i>Carex tribuloides</i>	Blunt Broom Sedge	G	4	FACW	2	5.42
<i>Carex typhina</i>	Cattail Sedge	G	5	OBL	6	1.93
<i>Carex vulpinoidea</i>	Fox Sedge	G	1	OBL	1	2.30
<i>Cinna arundinacea</i>	Wood Reed Grass	G	4	FACW	4	5.97
<i>Eleocharis obtusa</i>	Blunt Spike Rush	G	1	OBL	2	4.59
<i>Elymus riparius</i>	Riverbank Wild Rye	G	5	FACW	32	2.13
<i>Elymus virginicus</i>	Virginia Wild Rye	G	3	FACW	32	3.09
<i>Glyceria striata</i>	Fowl Manna Grass	G	2	OBL	0.25	0.92
<i>Lolium multiflorum</i>	Annual Rye	G		NL		0.00
<i>Panicum clandestinum</i>	Deertongue Panic Grass	G	2	FACW	16	8.04
<i>Poa palustris</i>	Fowl Bluegrass	G	5	FACW	4	11.94
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	G	7	OBL	4	1.84
<i>Schoenoplectus pungens</i>	Three-square Bulrush	G	5	OBL	4	1.10
<i>Schoenoplectus tabernaemontanii</i>	Soft-stem Bulrush	G	2	OBL	0.125	0.09
<i>Scirpus cyperinus</i>	Wool Grass	G	1	OBL	0.125	4.88
					134.5	69.95

**Seeds/**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Form</b>	<b>CoC</b>	<b>Ind-OH</b>	<b>AMT (oz)</b>	<b>SQ FT</b>
<i>Aronia melanocarpa</i>	Black Chokeberry	S	5	FAC	6	2.20
<i>Carpinus caroliniana</i>	Hornbeam	T	5	FAC	8	0.34
<i>Cephalanthus occidentalis</i>	Buttonbush	S	6	OBL	32	9.18
<i>Ilex verticillata</i>	Winterberry	S	6	FACW	8	16.90
<i>Lindera benzoin</i>	Spicebush	S	6	FACW	24	0.15
<i>Rosa palustris</i>	Swamp Rose	S	5	OBL	16	0.59
<i>Sambucus canadensis</i>	Elderberry	S	3	FACW	6	2.49
<b>Per Acre Totals</b>					100	31.86
<b>Ounces</b>	292.4375					
<b>Pounds</b>	18.27734375					
<b>Seeds/SQ FT</b>	141.74					

**Emergent**

**ACRES: 1**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Form</b>	<b>CoC</b>	<b>Ind-OH</b>	<b>AMT (oz)</b>	<b>Seeds/ SQ FT</b>
<i>Carex comosa</i>	Bristly Sedge	G	2	OBL	6	4.13
<i>Carex crinita</i>	Fringed Sedge	G	3	OBL	8	4.22
<i>Carex hystericina</i>	Porcupine Sedge	G	5	OBL	6	4.13
<i>Carex lacustris</i>	Lake Sedge	G	5	OBL	6	4.41
<i>Carex stricta</i>	Tussock Sedge	G	5	OBL	4	4.87
<i>Glyceria striata</i>	Fowl Manna Grass	G	2	OBL	2	7.35

<i>Juncus canadensis</i>	Canada Rush	G	4	OBL	3	172.18
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	G	7	OBL	12	5.51
<i>Schoenoplectus pungens</i>	Three-square Bulrush	G	5	OBL	16	4.41
<i>Schoenoplectus tabernaemontanii</i>	Soft-stem Bulrush	G	2	OBL	10	7.12
<i>Scirpus cyperinus</i>	Wool Grass	G	1	OBL	0.025	0.98
<i>Scirpus polyphyllus</i>	Leafy Bulrush	G	6	OBL	20	183.65
<b>Per Acre Totals</b>						
<b>Ounces (Grasses)</b>			93.025			
<b>Pounds (Grasses)</b>			5.8141			
<b>Seeds/SQ FT</b>			402.95			

END OF SECTION

<b>5.0 SAPLING SPECIES (DEPENDENT ON AVAILABILITY)</b>
--

**Wetland**

**Acres: 1**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Type</b>	<b>CoC</b>	<b>Ind-OH</b>
<i>Aronia melanocarpa</i>	Black Chokeberry	S	5	FAC
<i>Carpinus caroliniana</i>	Blue-Beech	S	5	FAC
<i>Cephalanthus occidentalis</i>	Buttonbush	S	6	OBL
<i>Ilex verticillata</i>	Winterberry	S	6	FACW
<i>Rosa palustris</i>	Swamp Rosa	S	5	OBL
<i>Sambucus canadensis</i>	Elderberry	S	3	FACW
<i>Spiraea tomentosa</i>	Steeplebush	S	4	FACW
<i>Viburnum lentago</i>	Nannyberry	S	5	FAC
<i>Viburnum recognitum</i>	Northern Arrow-Wood	S	2	FAC
<b>Total</b>				

END OF SECTION

## SECTION 02090 – BEST MANAGEMENT PRACTICES

RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General Conditions of the Contract and Division-1 Specifications shall apply to all sections of the Work.

### 1.0 SCOPE

General Requirements: Best management practices shall be used during construction to reduce impacts to habitat and park facilities.

### 2.0 OEPA BEST MANAGEMENT PRACTICES

General Requirements: The Contractor shall adopt the best management practices included by the OEPA in its certification of the 2012 Nationwide Permits. These practices are as follows:

1. All best management practices for storm water management shall be designed and implemented in accordance with the most current edition of the NPDES construction general permit or any watershed specific construction general permit.
2. All avoided water resources and associated buffers/riparian areas shall be demarcated in the field and protected with suitable materials (e.g., silt fencing, snow fencing, signage, etc.) prior to site disturbance. These materials shall remain in place and be maintained throughout the construction process.
3. Disturbance and removal of vegetation from the project construction area is to be avoided where possible and minimized when necessary. Entry to surface waters shall be through a single point of access whenever practicable to minimize disturbance to riparian habitat. Unavoidable temporary impacts to forested riparian habitat shall be restored as soon as practicable after in-water work is complete using tree and shrub species native to the specific ecoregion where the project is located.
4. All dredged material placed at an upland site shall be controlled so that sediment runoff to adjacent surface waters is minimized to the maximum extent practicable.
5. Straw bales shall not be used as a form of erosion/sediment control unless used in conjunction with another structural control such as silt fencing.
6. Heavy equipment shall not be placed below the ordinary high water mark of any surface water, except when no other alternative is practicable.
7. Temporary fill shall consist of suitable non-erodible material and shall be stabilized to prevent erosion.
8. Cadmium chromium arsenate (CCA) and creosote treated lumber shall not be used in structures that come into contact with waters of the state.

END OF SECTION

**Part II**

**Construction Plan  
(Omitted)**

**Appendix G**  
**Mitigation Habitat Map**

**Appendix H**  
**Sample Mitigation Agreement**

## Mitigation Agreement

This Mitigation Agreement is entered into at LaGrange, Ohio, the \_\_\_\_ day of \_\_\_\_\_, 2014, between the North Coast Regional Council of Park Districts ("NCRCPD") and \_\_\_\_\_ ("Client").

### RECITALS

- A. The NCRCPD was organized to plan, develop and promote the restoration and rehabilitation of wetlands and has developed a mitigation bank known as the North Coast Mitigation Bank (the "Mitigation Bank") containing mitigation sites in Wood, Sandusky, Erie, Lorain and Medina counties.
- B. Mitigation for unavoidable impacts to wetlands can be located at mitigation banks, such as the Mitigation Bank, subject to regulatory approval on a project specific basis under the Clean Water Act (33 U.S.C. §§ 1251-1387) by the United States Army Corps of Engineers (the "COE") and/or the Ohio Environmental Protection Agency ("OEPA") under Chapter 6111 of the Ohio Revised Code.
- C. The Client desires to provide for the establishment, reestablishment and/or rehabilitation of wetlands at the Mitigation Bank to be considered by the COE and OEPA as fulfilling the Client's mitigation requirement pursuant to Sections 401 and 404 of the Clean Water Act or Chapter 6111 of the Ohio Revised Code.

NOW, THEREFORE, in consideration of the mutual promises contained herein and other good and valuable consideration, the receipt of which is hereby acknowledged, the Client and the NCRCPD agree to be bound by the following terms and conditions.

### PROVISIONS

#### 1. General Provisions

- A. The Client will complete Attachment 1 locating the project, and describing the wetland impacts and expected mitigation requirements for which the Client requests that mitigation be provided by the NCRCPD at its Mitigation Bank. An executed copy of this Mitigation Agreement, Attachment 1 and the initial deposit should be returned to NCRCPD at the address set forth at the end of this Mitigation Agreement. The Client agrees that the NCRCPD has the right to substitute a revised Attachment 1 based on the actual acres mitigated.
- B. The initial mitigation deposit made by the Client shall be held by the NCRCPD in a separate fund until such time as the Client receives the necessary Clean Water Act permit or isolated wetland permit from the COE and/or the OEPA.
- C. If the COE denies the Client's request for a Section 404 individual or nationwide permit for the wetland impacts within six (6) months from the receipt of Client's initial deposit, the Client may terminate this Mitigation Agreement and be refunded its deposit. If the OEPA denies the Client's request for a Section 401 water quality certification or isolated wetland permit within six (6) months from the receipt of Client's initial deposit, the Client may terminate this Mitigation Agreement and be refunded its deposit.
- D. If the Client fails to receive the necessary Clean Water Act permit(s) or isolated wetland permit from the COE and/or OEPA within six (6) months from the receipt of the Client's initial deposit, the NCRCPD has the right to terminate this Mitigation Agreement and refund the Client's deposit.
- E. If the Client requires additional time to pursue and receive its Clean Water Act permit and/or isolated wetland permit, it shall request such additional time in writing, specifying the amount of additional time required. The NCRCPD shall have the right, but not the obligation, to grant such additional time. If the

NCRCPD grants such additional time, then an additional mitigation deposit will be required to be deposited by the Client with the NCRCPD not later than five (5) days after the NCRCPD notifies the Client that such additional time has been granted.

## 2. Obligations of the Client

A. Pursuant to the requirements of Sections 401 and 404 of the Clean Water Act or the requirements of Chapter 6111 of the Ohio Revised Code, and the regulations promulgated by the COE and the OEPA, the Client is obligated to mitigate for wetland impacts at its project as more specifically described in Attachment 1. In order to mitigate for these impacts and meet the permit requirements of the Clean Water Act permit program and/or Chapter 6111 of the Ohio Revised Code, the Client hereby provides for the establishment, reestablishment and/or rehabilitation, monitoring and maintenance of wetlands as set forth herein.

B. The NCRCPD will apply the Client's payment to fund the establishment, reestablishment or rehabilitation of wetlands at the Mitigation Bank. The Client hereby agrees to pay to NCRCPD in consideration for its establishment, reestablishment or rehabilitation of wetlands at the Mitigation Bank the sum set forth in Attachment 1. The Client's initial deposit of ten percent (10%) of the mitigation credit fees will be based on the anticipated mitigation requirements at the time of execution of this Mitigation Agreement.

C. The balance of the Client's mitigation credit fees is due within ten (10) days following the issuance of the Clean Water Act permits or isolated wetland permit by the COE and/or the OEPA, copies of which will be provided by the Client to the NCRCPD. Should the Client's final mitigation requirements vary from its expected mitigation requirements, the Client will be notified by the NCRCPD of the balance of the mitigation credit fees due.

D. Client shall have no other liability for compensatory mitigation once this mitigation agreement is ratified by the NCRCPD, the permit is issued, and all mitigation credit fees are transferred to the NCRCPD.

## 3. Obligations of the North Coast Regional Council of Park Districts

A. The NCRCPD will establish, reestablish and/or enhance wetlands and will monitor and maintain the restored habitats in accordance with the Mitigation Banking Instrument (MBI) effective \_\_\_\_\_, 2014. All restored habitats will be integrated into the NCRCPD member district's county park system.

B. In consideration of the payment by the Client of the mitigation credit fees set forth in Attachment 1, the NCRCPD hereby agrees to establish, reestablish and/or enhance wetlands at its Mitigation Bank. The NCRCPD shall have sole responsibility to provide for the establishment, reestablishment and/or rehabilitation and the monitoring and maintenance of the wetlands as provided herein and in the MBI.

C. The NCRCPD will provide an annual accounting to the COE and/or the OEPA of the establishment, reestablishment and/or rehabilitation of the wetlands in the Mitigation Bank. The accounting will identify the Client, the mitigation site, and the acres of wetlands established, reestablished and/or rehabilitated pursuant to this Mitigation Agreement. In addition, the COE and OEPA will be supplied with annual monitoring reports for a minimum of five (5) years documenting the development of the established, reestablished and/or rehabilitated wetland habitats.

D. The Client may submit the executed copy of this Mitigation Agreement to the COE and/or the OEPA to document its commitment to mitigate for permitted impacts to wetlands. Unless the COE and/or OEPA expressly condition the Client's Clean Water Act permit(s) or isolated wetland permit on a specific location, the NCRCPD reserves the right to locate the Client's mitigation at what the NCRCPD deems to be the most appropriate and/or proximate site within the Mitigation Bank.

IN WITNESS WHEREOF, the parties hereto have executed this Mitigation Agreement on the date and year first written above.

CLIENT: \_\_\_\_\_

(Please print Client Name)

By: \_\_\_\_\_

Please print name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Telecopy: \_\_\_\_\_

Email: \_\_\_\_\_

Date: \_\_\_\_\_

NORTH COAST REGIONAL COUNCIL OF PARK DISTRICTS

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Make Check Payable To:        NCRCPD

Mail To:                            Neil Munger, Secretary, NCRCPD  
    c/o Wood County Park District  
    18729 Mercer Road  
    Bowling Green, Ohio 43402  
    Telephone: (419) 353-1897  
    Telecopy: (419) 353-7765  
    Email: [nmunger@wcparks.org](mailto:nmunger@wcparks.org)

ATTACHMENT 1  
TO BE COMPLETED BY CLIENT

<u>Description</u> Name of Client's Project					
Location of Client's Project		Street address; Township and County; coordinates of impact			
Impacts to Wetlands (in acres)		HUC Code:			
		Category 1	Category 2	Category 3	Total
404 Wetlands	Forested				
	Nonforested				
Isolated Wetlands	Forested				
	Nonforested				
Wetland Totals					
<b>Mitigation Requirements</b> Wetland Mitigation (in acres to nearest 1/10 acre).		From permit application; amount and type specified by COE and/or OEPA. Provide copy of permit when issued.			
<b>Mitigation Costs</b> Wetland Mitigation @ \$____ per acre times acres required.					
<b>Mitigation Sites*</b> <input type="checkbox"/> Wellington Reservoir <input type="checkbox"/> Letha House <input type="checkbox"/> Harris Road <input type="checkbox"/> Indian Hollow <input type="checkbox"/> Avon Lake Road <input type="checkbox"/> Mowery					
<b>Payment Terms</b> Initial: 10% on execution.					
Balance: due within 10 days of receipt of COE and/or OEPA permits or NCRCPD notification.					
<u>Total:</u>					
<u>Client's Name, Address, Telephone, Telecopy and Email:</u>					
<u>Consultant's Name, Address, Telephone, Telecopy and Email:</u>					

\*Service area descriptions can be reviewed at [www.wetlandsandwatershed.com](http://www.wetlandsandwatershed.com)

**Appendix I**  
**Baseline VIBI Scores**

VIBI DATA SUBMISSION v. 1.0

CALCULATIONS

monitoring event date site	1st	1st	1st	1st	1st
	2-Sep-10 Sheff 10 value	2-Sep-10 Sheff 10 VIBI-E	2-Sep-10 Sheff 10 VIBI-Ecst	2-Sep-10 Sheff 10 VIBI-SH	2-Sep-10 Sheff 10 VIBI-F
Carex	6	n/a	n/a	n/a	n/a
Cyperaceae	6	n/a	n/a	n/a	n/a
dicot	28	n/a	n/a	n/a	n/a
shade	18	n/a	n/a	n/a	7
shrub	0	n/a	n/a	n/a	n/a
hydrophyte	13	n/a	n/a	n/a	n/a
SVP	1	n/a	n/a	n/a	3
A/P ratio	0.0000	n/a	n/a	n/a	n/a
FQAI	16.0	n/a	n/a	n/a	3
%bryophyte	0.0039	n/a	n/a	n/a	0
%hydrophyte	0.1071	n/a	n/a	n/a	3
%sensitive	0.0052	n/a	n/a	n/a	0
%tolerant	0.4504	n/a	n/a	n/a	3
%invasive graminoids	0.0000	n/a	n/a	n/a	n/a
small tree	0.0984	n/a	n/a	n/a	10
subcanopy IV	0.0608	n/a	n/a	n/a	3
canopy IV	0.1699	n/a	n/a	n/a	7
biomass	no data	n/a	n/a	n/a	n/a
stems/ha wetland trees	2075	n/a	n/a	n/a	n/a
stems/ha wetland shrubs	0	n/a	n/a	n/a	n/a
%unvegetated	0.1350	n/a	n/a	n/a	n/a
%buttonbush	0.0000	n/a	n/a	n/a	n/a
%perennial native hydrophytes	0.6515	n/a	n/a	n/a	n/a
%adventives	0.2244	n/a	n/a	n/a	n/a
%open water	0.000	n/a	n/a	n/a	n/a
%unvegetated open water	0.000	n/a	n/a	n/a	n/a
%bare ground	0.540	n/a	n/a	n/a	n/a
	<b>SCORE</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>39</b>

VIBI DATA SUBMISSION v. 1.0

CALCULATIONS

monitoring event date site	1st	1st	1st	1st	1st
	2-Sep-10 Sheff 10				
	value	VIBI-E	VIBI-Ecst	VIBI-SH	VIBI-F
Carex	4	n/a	n/a	n/a	n/a
Cyperaceae	4	n/a	n/a	n/a	n/a
dicot	26	n/a	n/a	n/a	n/a
shade	14	n/a	n/a	n/a	7
shrub	0	n/a	n/a	n/a	n/a
hydrophyte	11	n/a	n/a	n/a	n/a
SVP	0	n/a	n/a	n/a	0
A/P ratio	0.0000	n/a	n/a	n/a	n/a
FQAI	15.6	n/a	n/a	n/a	3
%bryophyte	0.0288	n/a	n/a	n/a	3
%hydrophyte	0.0862	n/a	n/a	n/a	0
%sensitive	0.0087	n/a	n/a	n/a	0
%tolerant	0.3679	n/a	n/a	n/a	3
%invasive graminoids	0.0000	n/a	n/a	n/a	n/a
small tree	0.2673	n/a	n/a	n/a	3
subcanopy IV	0.1004	n/a	n/a	n/a	7
canopy IV	0.1772	n/a	n/a	n/a	3
biomass	no data	n/a	n/a	n/a	n/a
stems/ha wetland trees	1320	n/a	n/a	n/a	n/a
stems/ha wetland shrubs	0	n/a	n/a	n/a	n/a
%unvegetated	0.8500	n/a	n/a	n/a	n/a
%buttonbush	0.0000	n/a	n/a	n/a	n/a
%perennial native hydrophytes	0.4972	n/a	n/a	n/a	n/a
%adventives	0.1809	n/a	n/a	n/a	n/a
%open water	0.000	n/a	n/a	n/a	n/a
%unvegetated open water	0.000	n/a	n/a	n/a	n/a
%bare ground	2.550	n/a	n/a	n/a	n/a
	<b>SCORE</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>29</b>