

OHIO E.P.A.

JAN 11 2010

ENTERED DIRECTOR'S JOURNAL

BEFORE THE  
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

Atrium Medical Center  
105 McKnight Drive  
Middletown, Ohio 45044

:  
:  
:

Director's Final Findings  
and Orders

PREAMBLE

It is agreed by the parties hereto as follows:

I. JURISDICTION

These Director's Final Findings and Orders ("Orders") are issued to Middletown Regional Hospital ("Respondent") pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency ("Ohio EPA") under Ohio Revised Code ("ORC") §§ 6111.03 and 3745.01.

II. PARTIES BOUND

These Orders shall apply to and be binding upon Respondent and successors in interest liable under Ohio law. No change in the composition of Respondent or the ownership of the site described below shall in any way alter Respondent's obligations under these Orders.

III. DEFINITIONS

Unless otherwise stated, all terms used in these Orders shall have the same meaning as defined in ORC Chapter 6111. and the rules promulgated thereunder.

IV. FINDINGS

The Director of Ohio EPA has made the following findings:

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

By: W. T. ELL Date: 1/11/10

1. Respondent is developing the Atrium Campus Center ("Site"), on 48.85 acres east of I-75 and Union Road and North of SR 122, in the City of Middletown, Warren County, Ohio.
2. Because the project resulted in more than 1 acre of earth disturbance activities, a Construction Storm Water NPDES permit was required.
3. Because construction of the Site necessitated impacts to several wetlands and streams, a 404 Permit from the US Army Corps of Engineers and a Section 401 Water Quality Certification (WQC) from Ohio EPA were required.

#### **Findings Related to Storm Water**

4. Storm water construction activities discharge to Dick's Creek, which constitutes "waters of the state" and sediment contained in that storm water constitute "other wastes."
5. Ohio EPA granted Respondent coverage under the Ohio EPA General Storm Water NPDES Permit for Construction Activities #OGC02689\*AG on January 3, 2008.
6. A January 9, 2008 site inspection conducted by Ohio EPA revealed that work on the site had begun prior to January 3, 2008. Thus, storm water runoff associated with these construction activities occurred without authorization under a valid NPDES permit, in violation of ORC 6111.04 and OAC 3745-38-06 until the date of permit coverage.
7. By letter dated January 16, 2008, Ohio EPA notified Respondent of violations of the NPDES storm water permit discovered during the January 9, 2008 inspection including:
  - i. Failure to stabilize portions of the site adjacent to streams and developed drainage swales. (Violation of Part III.G.2.i);
  - ii. Failure to maintain a sediment settling pond with an outlet capable of providing maximum sediment settling. (Violation of Part III.G.2.d.ii);
  - iii. Failure to perform and/or log inspections of sediment controls. (Violation of Part III.G.2.i).
8. ORC § 6111.04 prohibits any person from causing pollution or causing any

sewerage, industrial waste or other waste to be placed in any location where they cause pollution to waters of the state, except if such discharges occur in accordance with an Ohio NPDES permit issued by the Director.

9. ORC § 6111.07(A) prohibits any person from violating, or failing to perform any duty imposed by ORC §§ 6111.01 to 6111.08, or violating any order, rule, or term or condition of a permit issued or adopted by the Director of Environmental Protection pursuant to those sections. Each day of violation is a separate offense.
10. Respondent's commencement of construction activity prior to receiving coverage under the Construction Storm Water General Permit and the violations noted in Finding No. 7 are violations of ORC 6111.07(A).

#### **Findings Related to 401 Issues**

11. Ohio EPA received an initial application for a Section 401 WQC from Respondent on June 4, 2007.
12. Ohio EPA inspected the site as part of application review on December 19, 2007. As a result of the investigation, Ohio EPA determined that Respondent illegally placed fill into waters of the state without a valid 401 CQC, in violation of OAC Chapter 3745-32 and ORC Section 6111.04.
13. Ohio EPA determined that the impacts exceeded those proposed in the 401 WQC application. An NOV was sent January 8, 2008.
14. Respondent submitted a revised 401 WQC application to Ohio EPA on June 24, 2008 that included those waters impacted but not previously covered by the June 4, 2007 WQC application.
15. On September 29, 2008, Ohio EPA issued its 401 WQC for the project. The WQC authorized 918 feet of stream impact and .5 acres of Category 2 wetlands.
16. The mitigation for these impacts included the following: 7,602 linear feet of stream preserved on-site; 11.04 acres of on-site forested riparian corridors and 26.29 acres of on-site forested land outside the riparian corridor; creation of 230 linear feet of stream using natural stream channel design methods and the creation of .7 acres of forested buffer along the created stream. Mitigation of the .5 acres of wetland impact was specifically reserved for inclusion in these Findings and Orders.
17. On April 7, 2009, Respondent submitted a revised/final Mitigation Plan, attached

hereto as Exhibit 1, for the .5 acres of wetland impacts. The mitigation consists of enhancement of a 3 acre wetland along with the protection of an adjacent 5 acre upland buffer. The mitigation plan provides for the design, monitoring, performance standards, and long term protection of the mitigation wetland and upland buffer.

18. The Director has given consideration to, and based his determination on, evidence relating to the technical feasibility and economic reasonableness of complying with these Orders and to evidence relating to conditions calculated to result from compliance with these Orders, and its relation to the benefits to the people of the State to be derived from such compliance in accomplishing the purposes of ORC Chapter 6111.

#### V. ORDERS

1. Respondent shall maintain compliance with the Construction Storm Water General Permit.
2. Respondent shall not initiate construction activities in the state of Ohio that disturbs more than one acre of land without having first developed and implemented a SWP3 for the construction site, and obtained coverage of the construction site under the Construction Storm Water General Permit.
3. Respondent shall not alter, fill, dredge, or otherwise degrade the uses and/or existing functions or values of any portion of a wetland or stream at any location in Ohio, without first receiving prior approval from the Director as required by law.
4. Respondent shall implement the approved Mitigation Plan for offsite mitigation attached hereto as Exhibit 1 and shall meet the performance standards set forth in the plan within 5 years of completion of construction.
5. Respondent shall pay the amount of nine thousand, five hundred dollars (\$9,500.00) in settlement of Ohio EPA's claim for civil penalties, which may be assessed pursuant to ORC Chapter 6111. Within thirty (30) days after the effective date of these Orders, payment to Ohio EPA shall be made by an official check made payable to "Treasurer, State of Ohio" for seven thousand, six hundred dollars (\$7,600) of the total amount. The official check shall be submitted to Brenda Case, or her successor, together with a letter identifying Respondent and the site, to:

Ohio EPA  
Office of Fiscal Administration  
P.O. Box 1049

Columbus, Ohio 43216-1049

A photocopy of the check shall be sent to Ohio EPA Southwest District Office in accordance with Section X of these Orders.

6. In lieu of paying the remaining one thousand, nine hundred dollars (\$1,900) of the civil penalty, Respondent shall within thirty (30) days of the effective date of these Orders, fund a Supplemental Environmental Project ("SEP") by making a contribution in the amount of remaining one thousand, nine hundred dollars (\$1,900) to the Ohio EPA's Clean Diesel School Bus Fund (Fund 5CD). Respondent shall tender an official check made payable to "Treasurer, State of Ohio" for said amount. The official check shall be submitted to Brenda Case, or her successor, together with a letter identifying the Respondent and the site, to:

Ohio EPA  
Office of Fiscal Administration  
P.O. Box 1049  
Columbus, Ohio 43216-1049

A copy of each check shall be sent to Mark Mann, Environmental Manager, Storm Water and Enforcement Section, or his successor, at the following address:

Ohio EPA  
Division of Surface Water  
P.O. Box 1049  
Columbus, Ohio 43216-1049

7. Should Respondent fail to fund the SEP within the required time frame set forth in Order No. 6 Respondent shall immediately pay to Ohio EPA the remaining one thousand, nine hundred dollars (\$1,900) of the civil penalty in accordance with the procedures in Order No. 5.

#### **VI. TERMINATION**

Respondent's obligations under these Orders shall terminate when Respondent certifies in writing and demonstrates to the satisfaction of Ohio EPA that Respondent has performed all obligations under these Orders and Ohio EPA's Division of Surface Water acknowledges, in writing, the termination of these Orders. If Ohio EPA does not agree that all obligations have been performed, then Ohio EPA will notify Respondent of the obligations that have not been performed, in which case Respondent shall have an opportunity to address any such deficiencies and seek termination as described above.

The certification shall contain the following attestation: "I certify that the information contained in or accompanying this certification is true, accurate and complete."

This certification shall be submitted by Respondent to Ohio EPA and shall be signed by a responsible official of Respondent.

#### **VII. OTHER CLAIMS**

Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a party to these Orders, for any liability arising from, or related to the Site.

#### **VIII. OTHER APPLICABLE LAWS**

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations. These Orders do not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Respondent.

#### **IX. MODIFICATIONS**

These Orders may be modified by agreement of the parties hereto. Modifications shall be in writing and shall be effective on the date entered in the journal of the Director of Ohio EPA.

#### **X. NOTICE**

Unless otherwise specified, all documents required to be submitted by Respondent pursuant to these Orders shall be addressed to:

Ohio Environmental Protection Agency  
Southwest District Office  
401 East Fifth Street  
Dayton, Ohio 45402-29117  
(ATTN: Enforcement Group Leader)

#### **XI. RESERVATION OF RIGHTS**

Ohio EPA and Respondent each reserve all rights, privileges and causes of action, except as specifically waived in Section XI. of these Orders.

## **XII. WAIVER**

In order to resolve disputed claims, without admission of fact, violation or liability, and in lieu of further enforcement action by Ohio EPA for only the violations specifically cited in these Orders, through the date of these Orders, Respondent consents to the issuance of these Orders and agrees to comply with these Orders. Compliance with these Orders shall be a full accord and satisfaction for Respondent's liability for the violations specifically cited herein.

Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders, and Respondent hereby waives any and all rights Respondent may have to seek administrative or judicial review of these Orders either in law or equity.

Notwithstanding the preceding, Ohio EPA and Respondent agree that if these Orders are appealed by any other party to the Environmental Review Appeals Commission, or any court, Respondent retains the right to intervene and participate in such appeal. In such an event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

## **XIII. EFFECTIVE DATE**

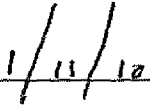
The effective date of these Orders is the date these Orders are entered into the Ohio EPA Director's journal.

**XIV. SIGNATORY AUTHORITY**


Each undersigned representative of a Party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such Party to these orders.

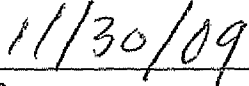
**IT IS SO ORDERED AND AGREED:  
Ohio Environmental Protection Agency**

  
\_\_\_\_\_  
Chris Korleski  
Director

  
\_\_\_\_\_  
Date

**IT IS SO AGREED:  
Atrium Medical Center**

  
\_\_\_\_\_  
By

  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Printed or Typed Name

  
\_\_\_\_\_  
Title



Exhibit 1

**Wetland Mitigation Plan for Atrium Medical Center:  
Silver Lake Wetland Corridor Wetlands Enhancement Project  
Miami County Park District**

(ACOE Public Notice No. 2007-157-GMR/Ohio EPA ID No. 073161)

**April 7, 2009**

Prepared for:

**Atrium Medical Center**  
P.O. Box 8810  
Middletown, OH 45042

Prepared by:

Mark A. Dilley, MS, PWS



*Specialists in  
Ecological & Wetland Consulting*

253 N. State Street, Suite 101  
Westerville, OH 43081

## TABLE OF CONTENTS

	<u>Page</u>
1 INTRODUCTION AND WETLAND MITIGATION OBJECTIVES .....	1
2 SITE SELECTION 2 .....	2
3 SITE PROTECTION INSTRUMENT .....	5
4 BASELINE INFORMATION .....	6
4.1 Comparison of Impact Site and Mitigation Site .....	6
4.2 Proposed Mitigation Site Details .....	6
4.2.1 Responsible Parties .....	8
4.2.2 Physical Attributes of the Mitigation Site .....	8
4.2.2.1 Soils .....	9
4.2.2.2 Hydrology .....	10
4.2.2.3 Existing Plant Community Types .....	10
5 DETERMINATION OF CREDITS .....	11
6 MITIGATION WORK PLAN .....	11
7 FIVE YEAR MAINTENANCE PLAN .....	13
8 PERFORMANCE STANDARDS .....	14
9 MONITORING REQUIREMENTS .....	15
10 LONG-TERM MANAGEMENT PLAN .....	17
11 ADAPTIVE MANAGEMENT PLAN .....	18
12 FINANCIAL ASSURANCES .....	18
REFERENCES & RESOURCES .....	19

Figures

Appendices

## LIST OF FIGURES

### Figure

- 1 General Location – Impact Site
- 2 Atrium Mitigation Wetland Enhancement Planting Plan

## LIST OF APPENDICES

### Appendix

- A November 24, 2008 Agency Meeting Summary – Atrium Mitigation Site
- B Corridor Overview Image & Supporting Materials for Jurisdictional Determination
- C Miami County Park District Deed and Conservation Easement Documents
- D Construction Drawings
- E Project Area Wetland Delineation Map
- F Soils Map
- G Planting Details

## **Wetland Mitigation Plan for Atrium Medical Center**

### **1 INTRODUCTION AND WETLAND MITIGATION OBJECTIVES**

To facilitate the development of the Middletown Regional Hospital and its associated campus, Atrium Medical Center (Atrium) received a Section 401 Water Quality Certification (Ohio EPA ID No. 073161) to impact a total of 0.5 acres of Category 2 forested and non-forested wetlands. After Ohio EPA would not approve Atrium's first two proposed mitigation alternatives, Atrium representatives learned, through their affiliate Miami Valley Hospital (MVH), of the Silver Lake Wetland Corridor Wetland Enhancement Project in Miami County. This Wetland Enhancement Project, near New Carlisle, was originally identified by the Honey Creek Watershed Association and is managed by the Miami County Park District (MCPD).

Atrium intends to compensate for wetland impacts at its Middletown facility through enhancement of three (3) acres of recently-excavated wetland and protection of associated buffer on an adjacent 5-acre parcel immediately east of MVH's mitigation site off Dayton-Brandt Road (henceforth referred to as the Site; Figure 1). The bulk of the enhancement work will involve the planting of trees, shrubs, and herbaceous wetland plants to establish a high quality native plant community at the Site. Excavation was accomplished in late 2008, as a component of the hydrologic design of MVH's mitigation, but no planting plans had been developed, nor had a funding source been identified for this aspect of the project. The initial intent was to monitor the natural establishment of the plant community, but because of invasive species concerns and general objectives for the parcel, planting of the Site to establish an ecologically-valuable and resilient native plant community is desired by MCPD.

The target plant communities will include Category 2 forested and scrub-shrub wetland (including a central buttonbush pool). It is anticipated that this enhancement will positively influence the watershed by extending a high-quality natural corridor in the headwaters of the Great Miami River. Prior to completion of the MVH mitigation, much of the water flowing through this corridor was piped through an 18-inch drain tile directly to Indian Creek near its confluence with Honey Creek. This circumvented potential

water quality improvements associated with overland flow through the existing plant communities and percolation through the soils to groundwater. With the failure of portions of this tile and the addition of a water level control structure near Dayton-Brandt Road (part of the MVH mitigation), more of this runoff water is now being routed through wetlands and other densely vegetated areas within this corridor. It is expected that this will result in water quality improvements in Honey Creek that will ultimately benefit the Great Miami River watershed as a whole. This project also offers many ecological benefits by restoring and enhancing wetlands within a region already known for its unique geomorphology, wetlands, and associated plant and animal communities.

## **2 SITE SELECTION**

Work was recently completed on MVH's 2.7-acre wetland mitigation, immediately east of Dayton-Brandt Road. MCPD owns the 8-acre parcel on which this mitigation and associated buffer zone are located. The District also holds legal conservation easements with management rights on adjacent parcels east of the MVH mitigation (including the Site) between MVH's mitigation area and Silver Lake.

A considerable portion of this corridor contains listed hydric soils, but this shallow valley is drained by a century-old 18" drainage tile, resulting in considerable changes to the hydrologic regime and ecological character of the corridor.

Recent tile failure close to Silver Lake has resulted in excessive flooding and the loss of upland tree species that became established while the soils were better drained. This condition and MCPD's intention and ability (through existing conservation management easements) to manage and enhance wetlands within the corridor have created an opportunity for considerable restoration and enhancement opportunities.

MCPD worked closely with MVH and its consultants to design and construct their mitigation site. As a component of the hydrologic design of this mitigation area, MCPD re-invested a portion of the funds received from MVH to complete excavation on the Site. The purpose of this additional excavation was two-fold: 1) to relieve flooding onto adjacent properties by creating additional water storage and managing and directing the

surface flow of water toward the MVH mitigation, and 2) to *create an opportunity for additional wetland enhancement within the corridor.*

Atrium has expressed interest in satisfying their mitigation requirement for the Middletown wetland impacts at the Site. Since the excavation work at the Site has been completed (in the fall of 2008), Atrium proposes to provide funds to MCPD to enhance the restoration of wetlands at the Site through the planting and management of the excavated wetland area and associated buffer.

The Site for Atrium's mitigation is well-suited to wetland restoration, with a prevalence of hydric soils (Westland silty clay loam), existing preserved wetlands that will serve as source areas for seeds and wildlife, and enhanced hydrology as a result of the recent excavation work. Atrium's and MVH's mitigation wetlands will provide synergistic benefits due to their proximity and hydrologic interconnectivity. The Site has also benefited from previous consultation with Ohio EPA regarding the restoration approach within the corridor during the development and approval of MVH's Mitigation Plan. Although not required for MVH's mitigation, this Ohio EPA-approved plan includes a description of the earthwork that has now been completed on the Site.

Developing a combined plan for the two parcels allowed the excavation to be accomplished concurrently with the MVH mitigation, resulting in cost-savings for MCPD. It also provided a more comprehensive solution to address the hydrologic regime across the 5-acre and 8-acre parcels and adjacent properties. The goal is to alleviate some of the flooding problems eastward in the corridor, while maintaining wetland hydrology across this low portion of the landscape.

A preliminary meeting was held on November 24, 2008, at the proposed mitigation Site. The Site orientation meeting was led by Professional Wetland Scientist Mark A. Dilley (MAD Scientist & Associates) and was attended by representatives of Atrium, MCPD, the U.S. Army Corps of Engineers (Corps), and Ohio EPA. A summary of this meeting is presented in Appendix A.

During this meeting, questions were raised with regard to the feasibility of the Site for Atrium's mitigation: 1) The location of the mitigation relative to the impact site (Ohio EPA rules promote mitigation within the same hydrologic unit where possible), and 2)

The jurisdictional (*i.e.*, non-isolated) status of the Site, because the Corps' position is that filling of jurisdictional wetlands must be mitigated through construction of jurisdictional wetlands.

With respect to the first question, this proposed mitigation Site resides in the Upper Great Miami River watershed (its Hydrologic Unit Code or HUC is 0508001). The impact site is in the lower portion of this watershed, but a different hydrologic unit (HUC 0508002). However, mitigation in a different hydrologic unit is accepted if the applicant demonstrates that there is a "significant ecological reason" to do so and that the proposed mitigation will result in a "substantially greater ecological benefit" than other options. Generally, if compensatory mitigation is approved to occur in a different HUC, OAC 3745-1-54 states that "it shall be located in a watershed which is adjacent to the watershed where the impact is proposed to occur." These conditions are satisfied at the Site.

The Silver Lake corridor provides an exceptional ecological setting with high wetland restoration and enhancement potential. There are rare raised fen plant communities that have been studied by Ohio EPA wetland biologists and academic institutions. These fens support several plant species (mostly sedges of the genus *Carex*) that are listed as Threatened and Endangered by the State of Ohio. It is also one of the few locations at which *Nannothemis bella*, the State Endangered Elfin Skimmer dragonfly, has been documented. The moderate to high quality adjacent habitats, substantial buffers, and extensive protections that already exist (through MCPD conservation easements) provide a significant ecological reason to mitigate at the Site.

In addition, the drainage tile buried beneath the corridor continues to fail, and a water level control structure has been added near Dayton-Brandt Road, creating many opportunities to reclaim a more natural hydrologic regime and restore and enhance this portion of the Great Miami River watershed. Within the Honey Creek watershed, over 70% land use is agriculture. This area is reflective of the larger, encompassing Great Miami watershed, where agriculture is the dominant land use and impacts the most miles of stream, accounting for approximately 70% of non-point pollution (Ohio EPA, 1996). Efforts to control agricultural non-point pollution have resulted in measurable

environmental improvements, therefore, continued efforts relating to riparian and habitat restoration are encouraged (Ohio EPA, 1996).

The proposed mitigation will result in five acres of enhanced natural area and will establish a connection to a pre-existing natural area with high quality wetlands, thereby increasing protection of the Honey Creek watershed and, ultimately, the Great Miami River, through reduction of agricultural runoff.

With respect to the second question, wetlands restored and enhanced at the Site would be jurisdictional. A significant nexus has been identified through historical records of the 18" drainage tile and ditch system (provided by the Miami County Engineer's office). This system spans the corridor from Silver Lake to its discharge point on Indian Creek, immediately upstream of its confluence with Honey Creek. Honey Creek then flows west, approximately 3.7 river miles to the Great Miami River, a traditionally navigable water. Copies of the historical documents showing the ditch/tile system are included in Appendix B.

### **3 SITE PROTECTION INSTRUMENT**

The Site is protected in perpetuity under an existing Conservation Agreement that permits MCPD to restore wetlands on the property (see Appendix C). Based on a review of the easement by an Ohio EPA attorney, it was determined that this instrument was generally acceptable, but there were concerns with paragraph 15. This paragraph states:

"In the event Grantors desire to use the easement property in a manner or for a purpose that may be inconsistent with the easement, Grantor shall submit a request for such use in writing to Grantee. Grantee shall grant or deny approval of such request in writing within thirty (30) days of receipt by Grantee of Grantor's request. Grantee's failure to so respond shall constitute approval of the request. Grantee's approval of a request shall be denied only upon a reasonable determination by Grantee that the proposed use would be inconsistent with the purpose of this easement. In no event shall the denial of such a request by Grantee give rise to any claim by anyone for money damages against Grantee."



In negotiations with Ohio EPA, it was determined that this existing instrument would suffice provided that this paragraph were amended to tighten restrictions. This change was accomplished through an addendum to the instrument which documents that the "Grantors hereby agree that they will not invoke the notice provision provided in Paragraph 15 in any manner, or for any purpose, that might be reasonably be construed as promoting, facilitating or otherwise allowing damage or destruction to wetlands to be constructed on the real property." This addendum was signed by the property owners, witnessed by the Director of MCPD and was notarized and recorded. The addendum is included with the original Conservation Easement contract in Appendix C.

#### **4 BASELINE INFORMATION**

The impact site is located northeast of the intersection of Union Road and State Route 122 in Middletown, Warren County, Ohio. Wetlands and streams at this location were impacted for the purpose of constructing the 200-acre north campus of the Middletown Region Hospital Complex, Atrium Medical Center. The impacts include 748 linear feet of six unnamed ephemeral and intermittent tributaries to Dick's Creek, and four wetlands totaling 0.50 acre. The impact site is centered approximately on latitude 39.498751°, longitude -84.314941°.

The proposed mitigation site is located on land that is under a Conservation Easement held by the MCPD in the Upper Great Miami River watershed (HUC 05080001-200-040) at Dayton-Brandt Road in Bethel Township, Miami County, Ohio. The mitigation site is centered approximately on latitude 39.954174°, longitude -84.061827°.

##### **4.1 Comparison of Impact Site and Mitigation Site**

Details of the impact and mitigation sites are presented in Table 1.

##### **4.2 Proposed Mitigation Site Details**

The proposed Atrium mitigation site is on a 5-acre parcel protected by MCPD through a conservation easement. It is located in Bethel Township (Miami County, Ohio), east of Dayton-Brandt Road, ~0.4 mile north of New Carlisle Road (Figure 1).

**Table 1. Impact Site vs. Mitigation Site Summary**

Parameter	Impact Site	Mitigation Site
Impacted aquatic resources	748 lf stream impacts; 0.50 acre wetland impacts	Minor temporary wetland disturbance possible* during planting
Buffer quality	Low, agricultural row crops surrounded wetland prior to purchase of land	Moderate to high (old field, pasture, scrub-shrub, forest)
Buffer width(s)	Narrow (<20m)	Medium (between 25m and 50 m) or greater
Wetland type(s) present	Palustrine emergent/forested, seasonally flooded	Wet meadow, emergent (small, remnant areas persisting despite artificial drainage on site)
Wetland type(s) to be restored or enhanced	NA	3.0 mitigation acres of marginally-performing wet meadow, recently excavated (2008) but left unplanted; seasonally flooded
Conservation Easement area	NA	5 acres, to be managed by MCPD
Hydrology: Water Source	Precipitation	Groundwater, seasonal/intermittent surface water, precipitation
Hydrology: Duration	Seasonally inundated	Regularly inundated/saturated
Hydrology: Maximum water depth	<0.4 m (<15.7 in)	>0.7 m (>27.6 in)
Wetland Vegetation Communities	Emergent herbaceous, forest	Scrub-shrub and forested wetland with emergent/wet meadow component
Amphibian breeding pools	Unknown	Present
Habitat interspersions	Low	Moderate to moderately high
Coverage by invasive species	NA	Nearly absent (to be controlled)
ORAM Category	Impacted wetlands fall in Category 1 (confirmed by Ohio EPA)	Restored/enhanced wetlands expected to achieve Category 2 or 3 status

\*One wetland, covering 0.46 acres on site (within the parcel boundaries) has been identified at the mitigation site. No work of any kind will be performed within the boundary of this wetland.

#### 4.2.1 Responsible Parties

The involved parties and their specific project responsibilities are presented in Table 2.

**Table 2. Summary of Project Responsibilities**

<p><b>Conservation Easement holder – 5-acre parcel;</b> Mitigation site managers <i>(responsible for basic maintenance and monitoring for easement compliance)</i></p>	<p>Miami County Park District Jerry Eldred, Director 2645 E. St. Rt. 41 Troy, OH 45373-9692 (937) 335-6273</p>
<p><b>Permit applicant</b> <i>(responsible for hiring of wetland consultant, implementation of enhancement plan, and for funding mitigation per terms of agreement with MCPD)</i></p>	<p>John W. McKinney III Director, FMS &amp; Corporate Safety Officer Middletown Regional Health System Construction Offices, 6051 Market Ave. Franklin, OH 45005 (513) 420-5204</p>
<p><b>Wetland consultant</b> <i>(responsible for wetland design, agency coordination, plant installation/oversight, identification of adaptive management issues, and mitigation monitoring)</i></p>	<p>Mark A. Dilley, PWS MAD Scientist &amp; Associates LLC 253 N. State Street, Suite 101 Westerville, OH 43081-2560 (614) 818-9156</p>

#### 4.2.2 Physical Attributes of the Mitigation Site

The project area is situated in a broad, shallow valley that slopes very gently from Silver Lake westward. Elevations along the flow path from the lake exhibit minimal variation, ranging from ~841 feet above mean sea level (AMSL) near the lake to ~838 feet AMSL near Dayton-Brandt Road. This shallow valley is contained by hillsides that rise to elevations of ~860 feet AMSL and above to the south and ~850 feet AMSL to the north. Surface overflows from the lake move gradually westward through the corridor, eventually reaching the 8-acre parcel (MVH mitigation site) which is slightly steeper, dropping from ~840 feet AMSL at its east end to ~838 feet AMSL at its west end, over a distance of ~900 feet (~0.2% slope). These very gentle slopes on hydric soils (see Section 2.3.2.1) will be highly conducive to wetland restoration and enhancement within the project area. The Federal Emergency Management Agency (FEMA) floodplain maps (Panels 3903980135B and 3903980100B) do not indicate any flood hazard zones along the corridor.

One jurisdictional wetland, an emergent system with a few scattered shrubs, was identified at the Site. This wetland (identified as Wetland C) was delineated at the Site in spring of 2006 and was found to cover 0.46 acres onsite (with additional acreage

extending offsite). The findings of this study were provided to Dan Osterfeld at Ohio EPA in a Wetland Delineation report (MAD, Scientist LLC, 2006). The jurisdictional boundaries identified at that time are indicated on the construction drawings in Appendix D. A copy of the wetland map submitted to Ohio EPA during MVH's mitigation planning phase is also included in Appendix E. The Ohio Rapid Assessment Method (ORAM) score for Wetland C was 44, indicating a Modified Category 2 wetland.

#### 4.2.2.1 Soils

One broad band of Westland silty clay loam extends across almost the entire Site. The distribution of soils across the Site are shown on the soils map provided in Appendix F.

The Westland soil series is a listed hydric soil (USDA, n.d.). The presence of this hydric soil indicates that wetlands were likely more prevalent within the project area before the subsurface drainage was installed within the corridor. Its presence also portends a greater opportunity for successful wetland restoration and enhancement in the project area.

Soil samples taken during the wetland delineation and general site reconnaissance found that the soil profiles were generally consistent with those described in the Miami County Soil Survey (NRCS, 2004), although the distribution of these soil series differed somewhat from what was shown in the maps. The topsoil at the project area consists primarily of silt loam and silty clay loam, and is typically dark in color (*i.e.*, with a low chroma, indicative of hydric conditions). At greater depths (generally 12-36 inches), textures gradually indicate an increased clay content.

The listed hydric soil (Westland silty clay loam), on which most of the wetland restoration will be accomplished, has the following key properties pertinent to the planned project:

- *Depth to the top of the seasonal high water table:* 0.0 to 1.0 feet
- *Ponding:* Long
- *Depth of ponding:* 0.0 to 0.5 feet
- *Drainage class:* Very poorly drained
- *Organic matter content in the surface layer:* 2.0 to 6.0 percent
- *Permeability:* Moderately slow in the upper part of the soil and rapid in the underlying material

#### **4.2.2.2 Hydrology**

The main sources of water for the wetland restoration are surface runoff (overland flow), and subsurface flow through the existing 18" drain tile that extends from the Silver Lake outlet (overflow structure) across the Site and beyond, past Dayton-Brandt Road. The wetland's hydrology will be supplemented by a high water table and general groundwater flow from south to north toward the drain tile.

In the absence of precipitation, this subsurface flow would dominate the project area's hydrology. Based on several years of observation by UD, MCPD, and the mitigation design team, this tile appears to convey flows year-round, at estimated rates ranging from 0.5–6 cubic feet per second (cfs). With a project design capacity of approximately four acre-feet between the MVH mitigation wetland and Atrium's mitigation enhancement wetland, these flow rates could fill the wetland up to design capacity in as little as half a day. Even during low flow periods, this perennially-flowing pipe is expected to convey a sufficient volume to fill the wetland in approximately one week.

During and immediately following precipitation events, additional water is introduced to the project area through surface runoff and concentration along the length of the Silver Lake corridor. This indicates a typical condition where a surplus of water is available in the project area. The relatively steady and voluminous flows through the project area from multiple sources (*i.e.*, groundwater, tile flow, surface runoff) combined with the presence of artificial drainage and hydric soils make the hydrologic setting well-suited for wetland restoration and enhancement. Proper design will accomplish a natural "pulsing" hydrology, where water levels will rise following storm events and then recede to normal, shallow pool levels (generally <12" in depth with maximum depths of ~24").

#### **4.2.2.3 Existing Plant Community Types**

This Site was recently in agricultural use, and the land reflects numerous impacts from this history. The Site was most likely used as pasture and its central and northern portions are dominated by characteristic field grasses (particularly fescue). Since cessation of agricultural use, common field weeds have established across this artificially-drained site. This parcel is bordered by mature second-growth forest and scrub-shrub successional habitat on surrounding hillsides and boundary fencerows.

## 5 DETERMINATION OF CREDITS

Five wetlands are affected on Atrium's development site northeast of the intersection of Union Road and State Route 122 in Middletown, Ohio. Atrium prematurely filled/graded the smallest of these wetlands (identified as Wetland #2). As a result, the final mitigation ratio for the full 0.5 acres of wetland impact was increased as the penalty for premature filling. Thus, while filling of Category 2 wetlands generally is mitigated off-site at a 2:1 or 2.5:1 ratio, the mitigation ratio for this project will be 3:1, resulting in a mitigation requirement of 1.5 acre-credits.

The typical ratio at which Ohio EPA issues enhancement credits is 0.5 acres of credit per acre enhanced. Therefore, Atrium will fund these enhancements across 3.0 acres of the Site to secure the necessary acres of mitigation credit with Ohio EPA and the Corps. Atrium will also satisfy mitigation buffer requirements through the enhancement and protection of the additional 2 acres of the Site (5-acre parcel).

## 6 MITIGATION WORK PLAN

Because the initial earthwork was completed concurrently with MVH's mitigation, no additional excavation is planned. The completed earthwork at the Site has created additional storage and flow paths that direct overland flows to the central portion of the parcel and westward to the MVH mitigation area. The comprehensive project plan is depicted in the construction drawings (Appendix D). Atrium will hire a consultant/contractor team to enhance the Site through the planting of woody and herbaceous native species within the excavated wetland area and adjacent buffers.

Construction is anticipated to commence by early spring 2009, to get plants established in the moist-to-saturated soils and reduce the need for supplemental watering. Planting during this timeframe offers the added advantage of allowing direct observation of the typical spring hydrology and adjustments to the planting locations based on the tolerances of the individual species to be planted.

Existing natural plant communities surrounding the Site will be protected to provide a substantive buffer to the enhanced wetlands. This includes a 350-foot-wide (estimated average width) forested hillside to the south, a 0.3-mile forested corridor to the east, and

a 30-foot wide fencerow/thicket and broad pasture area to the north. These areas are all covered by Conservation Easement held by MCPD. The enhanced wetland on this Site will also benefit from additional wetlands and natural plant communities to the west, on the MVH mitigation parcel, following completion of construction.

Atrium's enhanced wetlands will consist of a variety of depth zones, ranging from an intermittently saturated fringe to a small central pool approximately 18" in depth. The excavation accomplished in 2008 has maintained large areas of the existing gently-sloped terrain (>10:1 slopes) to provide broad transition zones for the establishment of vegetation.

In general, the anticipated vegetation zones at the Site are as follows:

- Forested/Scrub-shrub, 841-840 ft AMSL;
- Scrub-shrub, 840-839 ft AMSL; and
- Emergent wetland, 839-838 ft AMSL.

To create a buffer to the north, seed mixes were installed on the berm and within the grassed waterway immediately following construction. A supplemental seeding of the berms and grassed waterway will be included in Atrium's enhancement activities. The berms will be seeded with a Slope Stabilization Mix and the grassed waterway will be seeded with Swale Mix (JF New or equivalent for both).

The forested/scrub-shrub zone will be planted with the following quantities of tree and shrub/small tree species

- *Acer saccharinum*, silver maple - 75
- *Carya laciniosa*, shellbark hickory - 25
- *Nyssa sylvatica*, blackgum - 29
- *Platanus occidentalis*, American sycamore - 25
- *Quercus bicolor*, swamp white oak - 75
- *Quercus palustris*, pin oak - 55
- *Aronia melanocarpa*, black chokeberry - 35
- *Carpinus caroliniana*, blue-beech - 26
- *Lindera benzoin*, spicebush - 65

The scrub-scrub zone will be planted will the following quantities of shrub species

- *Cephalanthus occidentalis*, buttonbush - 70
- *Potentilla fruticosa*, shrubby cinquefoil - 70
- *Rosa palustris*, swamp rose - 50

The emergent zone will be planted with the following herbaceous plugs and seed mix:

- *Carex hystericina*, porcupine sedge - 72
- *Carex stricta*, tussock sedge - 76
- *Solidago riddellii*, Riddell's goldenrod – 114
- *Zizia aurea*, golden alexanders – 72
- Sedge Meadow seed mix – 1 acre

Plant species were chosen that are native to Ohio and characteristic of high quality forested, scrub-shrub, and emergent wetlands, where the relative abundance of each species within each planted zone resembles that of a natural wetland. For example, *Carya laciniosa* and *Nyssa sylvatica* are found in lower numbers in forested wetlands than are *Acer saccharinum* and *Quercus palustris* (Mack 2007). Figure 2 depicts these zones and plantings and Appendix G provides details on plant species and installation.

The container grown woody plants to be installed should have well-developed, non-curling root systems, and be at least 5/8-inch basal caliper and four feet in height for trees, 3/8-inch caliper and three feet in height for shrubs. Forrest-Keeling Nurseries (provider of RPM trees and shrubs) is the recommended vendor for woody species and JF New is recommended for seed mixes and herbaceous plugs, but alternate, equivalent vendor(s) will be considered.

During transplantation, buffer plantings may be fertilized, but no fertilizers are to be applied directly in the enhanced wetland areas.

## 7 FIVE YEAR MAINTENANCE PLAN

Following completion of planting of woody and herbaceous native species within the excavated wetland area and adjacent buffers, Atrium will begin monitoring and maintaining the Site through separate agreements with MAD Scientist & Associates and MCPD, respectively, during the five-year monitoring period. Under its agreement with Atrium, MCPD will be responsible for the periodic inspection of the conservation easement and mitigation wetland. During regular visits to the Site, MCPD will examine the Site for any acts or threatened acts of third parties that may violate the easement and thereby threaten the survival of the plantings. MCPD will also make a general assessment of conditions and report to Atrium or the consultant any discovery of, for example, significant loss of wetland vegetation, unusual flooding or dry conditions that



might threaten the plantings, emerging threats of non-native or invasive species, and the like.

Pursuant to the separate agreement with MAD Scientist & Associates, the consultant will be responsible for the detailed monitoring required by Ohio EPA and the Corps. The consultant will also coordinate with MCPD for its assistance in inspecting general Site conditions during the five-year monitoring period. When requested by Atrium or MAD Scientist & Associates, MCPD will provide assistance through, for example, planting or replanting of the Site, removal of non-native or invasive species, drainage improvements or enhancements, repair/replacement of signage, and general maintenance of the buffer. During this five-year period, MCPD will also assist MAD Scientist & Associates, if requested, in the consultant's performance of the measurements that are necessary for Atrium to comply with the post-construction annual monitoring and reporting requirements for the Site during the five-year monitoring period.

After the performance standards have been attained for the Site, the Site will be maintained in perpetuity by MCPD using its conservation easement (see Appendix C).

## **8 PERFORMANCE STANDARDS**

Within five (5) years after completion of construction, the wetlands will have developed 3.0 acres of jurisdictional Category 2 and/or 3 *developing* mixed forested/scrub-shrub and non-forested wetlands. By the end of the five-year monitoring period, the Vegetation Index of Biotic Integrity (VIBI) score is expected to be 45 or higher. Coverage by non-native or invasive species should not exceed 5% and unvegetated open water should account for less than 10% of the mitigation wetland area. "Unvegetated open water," per Ohio EPA, is characterized by inundated areas with minimal or no emergent, rooted aquatic bed species (such as spatterdock, water lily, or pondweed), or submersed or floating non-rooted aquatic bed (such as bladderwort and coontail, specifically excluding duckweed, watermeal, and related vegetation in this family).

## 9 MONITORING REQUIREMENTS

Atrium will have the Site monitored by MAD Scientist & Associates during development of the wetlands, to ensure their satisfactory performance. If performance is unsatisfactory (e.g., does not meet Ohio EPA or Corps requirements) or problems are noted, Atrium will implement adaptive management measures at the site to resolve these issues. Implementation of on-site corrective measures is the preferred course of action. No off-site locations for contingency mitigation are currently proposed.

Following completion of construction, a letter report documenting completion of the enhancement plantings, will be submitted to Ohio EPA within 60 days. Monitoring of the Atrium mitigation wetland area will be performed by Atrium's wetland consultant. This consultant will create a figure using the as-built drawing to select and indicate permanent monitoring points established within Atrium's mitigation wetlands. Their annual report will be submitted to Ohio EPA for each of five consecutive years following completion of mitigation construction. The first annual report is due to Ohio EPA by December 31<sup>st</sup> of the first full year following completion of mitigation construction (i.e., 2010). All subsequent reports evaluating wetland development will be submitted by December 31<sup>st</sup> of each monitoring year.

The anticipated monitoring requirements are as follows:

Physical Measurements (Year 1): A plan view and at least one cross-section and topographic profile through the short axis and another through the long axis are required for each mitigated wetland.

Photographs (Annually): A representative observation point shall be selected in each plant community type within the mitigation area. This shall be a point which best represents the characteristics of the entire plant community. The observation points shall be marked on the base map.

Applicant shall take photographs from these points annually for five years. Each color photo point shall be photo documented from the same position and angle during mid- to late summer of each monitoring year.

Hydrology monitoring (Annually): Water level data shall be collected in May and August of each monitoring year. Ground water levels shall be measured in the absence of inundated conditions.

Soils Monitoring (Annually): A minimum of one soil probe or test pit per acre of mitigated wetland shall be collected. Describe the soil profile and hydric soil indicators. Indicate the soil map unit name (soil series and phase) and the taxonomic subgroup.

Vegetation Monitoring (Annually): The location and name of each plant community type within the mitigation area and buffer area shall be marked on a scaled drawing or scaled aerial photograph (base map) and named.

A representative observation point shall be selected in each plant community type in each distinct wetland mitigation area. This shall be a point which best represents the characteristics of the entire plant community. The observation points shall be marked on the base map.

The dominant plant species shall be visually determined in each vegetation layer of each community type, and the scientific names of these species shall be included in the report. Dominant species are those species which have the greatest relative basal area (woody overstory), greatest height (woody overstory), greatest percentage of aerial coverage (herbaceous understory), and/or greatest number of stems (woody vines).

Vegetation Index of Biotic Integrity (VIBI) (Years 3 and 5): During the growing season of the third and fifth years after completion of construction of the mitigation wetlands, the applicant shall assess the mitigation wetlands to obtain a VIBI score in accordance with the methods approved by Ohio EPA (<http://www.epa.state.oh.us/dsw/401/401.html>).

4<sup>th</sup> Year Site Visit: The applicant shall arrange a mitigation meeting and mitigation site visit with Ohio EPA during the growing season after the third year report has been submitted. The purpose of this inspection is to determine if the mitigation project has been constructed in accordance with the agreement between the applicant and Ohio EPA. If necessary, Ohio EPA may make recommendations to improve the wetland. The applicant is responsible for undertaking any reasonable modifications identified as necessary by Ohio EPA.

Wetland Delineation (Year 5): The applicant shall conduct delineation of the restored mitigation wetlands during the growing season of the fifth year after completion of construction of the mitigation wetlands using the Midwest Regional Supplement to the US Army Corps of Engineers 1987 Wetland Delineation Manual (or successor document).

## **10 LONG-TERM MANAGEMENT PLAN**

As part of the mitigation agreement between Atrium and MCPD, Atrium will make a lump sum payment to MCPD to ensure the post-monitoring stewardship of the Site. MCPD will manage these funds to provide for long-term oversight of the Site, including the monitoring of conservation easement compliance, control of invasive species, and general maintenance.

MCPD has long-term management control over the Site through a conservation easement on the Site (5-acre parcel). A copy of this conservation easement is provided in Appendix C. This arrangement allows for the long-term sustainability of Atrium's wetland enhancement mitigation. In the interest of establishing a self-maintaining wetland, the site has been built using simple excavation and embankment, with low berms (and a stone-lined emergency spillway down-gradient of the site on the MVH mitigation site). The planned normal pool elevation is 839.5, but post-construction adjustments may be made to optimize performance as part of the adaptive management process. Such changes may be accomplished by adjusting boards in the water level control structure near Dayton-Brandt Road at the west end of the MVH mitigation site.

No high-maintenance engineered structures are needed to accomplish the design enhancements at the Site. It should be noted that, although now failing, the existing tile has been in place for approximately a century, and it still conveys significant flows under both project area parcels. This water source and the surface water runoff contributions within this appropriate hydrologic setting (at the base of a shallow valley) are expected to provide an adequate and reliable source of water for the enhanced wetlands.

## **11 ADAPTIVE MANAGEMENT PLAN**

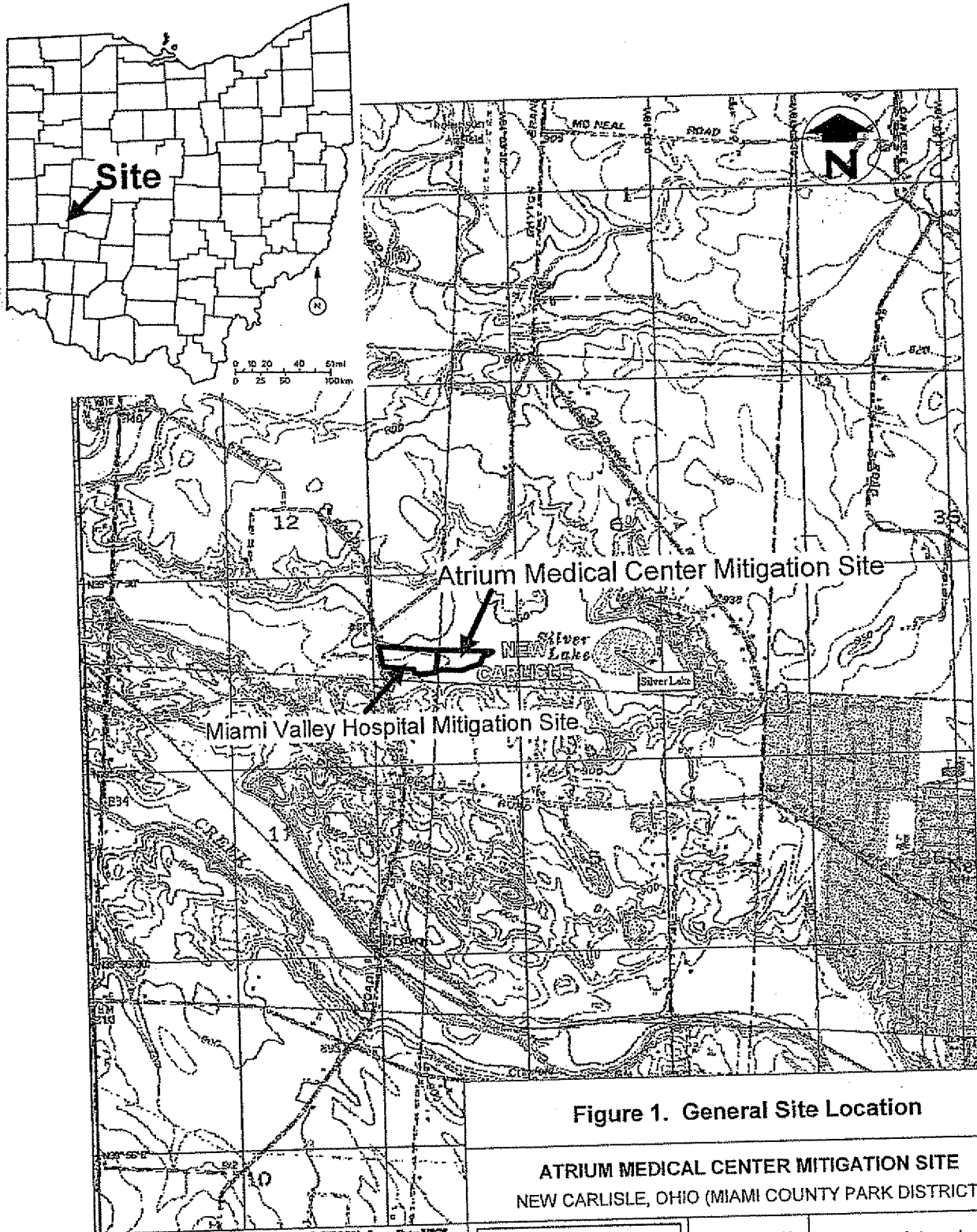
Atrium's wetland consultant, MAD Scientist & Associates, will assume the primary responsibility for the initial identification of performance-related issues with assistance from MCPD during its routine inspections of the Site. This will be accomplished during the post-construction monitoring of the Site. MAD Scientist & Associates and/or MCPD will notify Atrium when any such issues are observed. With the exception of emergency repairs, which would be implemented immediately, MAD Scientist & Associates will present any planned adaptive management activities at the Site to the Corps and Ohio EPA on Atrium's behalf, and request written concurrence with said plans before activities commence.

## **12 FINANCIAL ASSURANCES**

Atrium assumes the primary financial responsibility for the implementation of adaptive management of the mitigation Site during the five-year post-construction monitoring period, and also for any corrective measures necessary above and beyond activities covered under the basic site management agreement with MCPD. This arrangement, to remain in effect until a mitigation success determination is made by Ohio EPA and the Corps, will be documented in the mitigation agreement with MCPD.

## REFERENCES & RESOURCES

- Biebighauser, T.R. 2007. Wetland Drainage, Restoration, and Repair. University Press of Kentucky. pp. 145-146.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report. Y-87-1. U.S. Army Engineers Waterways Experiment Station. Vicksburg, MS.
- Kollmorgen. 1975. Munsell Soil Color Charts. Kollmorgen Corporation Baltimore, MD.
- Mack, John J. 2007. Integrated Wetland Assessment Program. Part 9: Field Manual for the Vegetation Index of Biotic Integrity for Wetlands v. 1.4. Ohio EPA Technical Report WET/2007-6. Ohio. Environmental Protection Agency, Wetland Ecology Group, Division of Surface Water, Columbus, Ohio.
- MAD Scientist, LLC. 2006. Jurisdictional Waters and Isolated Wetlands Report for the Miami County Park District Wetland Mitigation Site. New Carlisle, Ohio. June 26, 2006. Prepared for: Miami Valley Hospital / Premier Health Partners, Inc. Submitted to Dan Osterfeld, Ohio EPA.
- Mitsch, W.J. and J.G. Gosselink. 1993. Wetlands. Second Edition. Van Nostrand Reinhold. New York. 722 pp.
- Ohio EPA. 1996. Biological and Water Quality Study of the Upper Great Miami River and Selected Tributaries: Montgomery, Miami, Shelby, Logan, Clark, Hardin, and Auglaize Counties, Ohio. December 6, 1996. Ohio EPA Technical Report MAS/1995-12-13.
- Ohio EPA. 2001. Ohio Rapid Assessment Method for Wetlands. Version 5.0 Final. Ohio Environmental Protection Agency. Columbus, Ohio.
- USDA. n.d. Hydric soils of Miami County. (online).
- USDA. 1987. Hydric Soils of the United States. Prepared in cooperation with the National Technical Committee for Hydric Soils. Soil Conservation Service. U.S. Dept. of Agriculture. Washington, D.C.
- USDA. 1997. Ponds – Planning, Design and Construction. Agricultural Handbook 590. U.S. Dept. of Agriculture. Washington, D.C.
- USFWS. 1996. National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary. U.S. Fish and Wildlife Service. Washington, D.C. <http://www.nwi.fws.gov/ecology.htm>. 209 pp.
- USFWS. 1995. National Wetland Inventory Map. New Carlisle, Ohio Quadrangle. U.S. Fish and Wildlife Service. (Base Map: 7.5 Minute topographic Series).



3-D TopoQuads Copyright © 2009 DeLorme Yazzowski, ME 04094 Source Date: 1/5/03

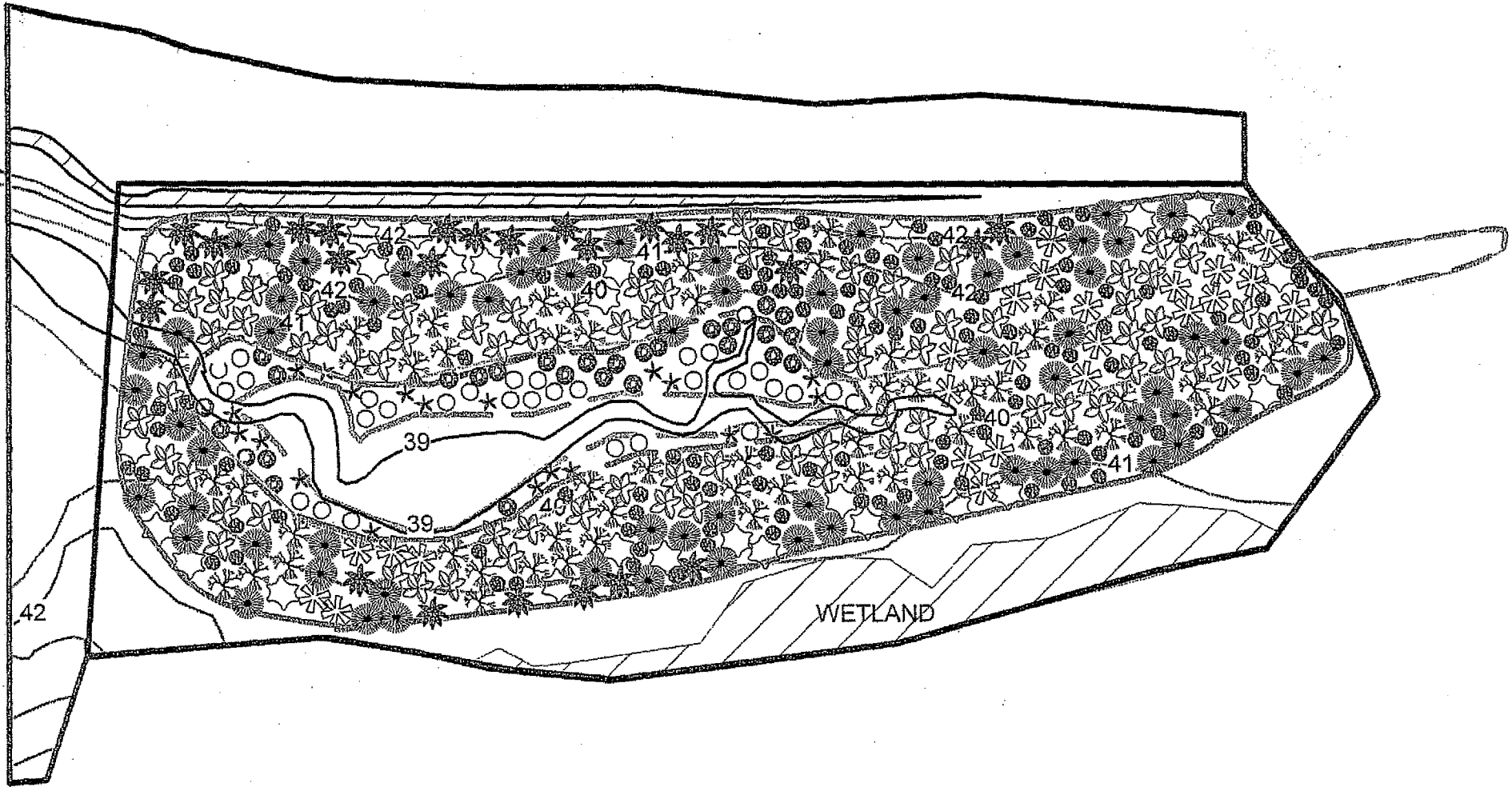
**Figure 1. General Site Location**

**ATRIUM MEDICAL CENTER MITIGATION SITE**  
 NEW CARLISLE, OHIO (MIAMI COUNTY PARK DISTRICT)

**MAD**  
 Scientist  
 & ASSOCIATES LLC

1" = ~2260'	Contour Interval = 10'
MAD	12/30/2008

Source: DeLorme 3-D Topo Quads (1999)  
 New Carlisle, Ohio topographic quadrangle



**KEY**



- parcel boundary
- emergent planting zone
- shrub planting zone
- tree planting zone



- Acer saccharinum*
- Carya laciniosa*
- Nyssa sylvatica*
- Platanus occidentalis*
- Quercus bicolor*
- Quercus palustris*
- Potentilla fruticosa*
- Rosa palustris*
- Cephalanthus occidentalis*
- mixed shrubs/small trees

**Figure 2. Atrium Mitigation  
Wetland Enhancement Planting Plan**

NEW CARLISLE, OH



KA	03/03/09



**APPENDIX A**

**November 24, 2008 Agency Meeting Summary**

**Atrium Mitigation Site**



*Specialists in  
Ecological & Wetland  
Consulting*

**Atrium Medical Center Wetland Mitigation  
Miami County Park District (MCPD) Silver Lake Corridor Site  
November 24, 2008 - Meeting Summary (Prepared by M. Dilley)**

Time: 10:00 a.m. – ~11:30 a.m.

Participants: Doug McNeill (CEO, Atrium), John McKinney (Atrium), Denise Marmer (U.S. Army Corps of Engineers), Laurie Moore (Ohio EPA), Kevin Swanson (MCPD), Jerry Eldred (Director, MCPD), Mark Dilley (MAD Scientist & Associates)

**Summary:**

**Greeting and Introductions**

Mark and Kevin oriented group to site history, current (Miami Valley Hospital) mitigation project, MCPD's objectives within the Silver Lake corridor, and potential mitigation options for Atrium.

Options available include additional work (supplemental excavation, plantings, invasive species management, maintenance, and monitoring) on adjacent 5-acre parcel. Denise explained that Corps could not issue credit for excavation work already accomplished. Since the 5-acre parcel has not been planted, Atrium could potentially receive their necessary mitigation credit (~1.5 acres) through enhancement credit (typically issued at a ratio of 0.5 acres per acre enhanced). Therefore, if Atrium were to pay for the development of a planting plan and installation of plantings on 3 acres, the agencies might be able to approve this effort as mitigation for Atrium's wetland impacts at its new campus in Middletown, Ohio.

Both Laurie and Denise stressed that they need to be presented with a formal mitigation proposal in order to complete a review and approve said mitigation. Denise also requires documentation to complete a Jurisdictional Determination. For the Corps to approve the mitigation for the Section 404 permit, the wetlands must be documented as jurisdictional (*i.e.*, non-isolated). This requires maps and other documentation that will substantiate a connection (through wetlands, streams, other surface waters or tiles) from the mitigation site to Honey Creek and into the Great Miami River. Mark, Kevin and Jerry expressed confidence that such a connection does exist and, at the request of Doug, Mark and Kevin agreed to research the issue and provide any maps and documentation available to substantiate this connection.

Another regulatory issue that must be addressed, as mentioned by Denise and Laurie, is the fact that the mitigation would occur in a different 8-digit HUC (Hydrologic Unit Code) watershed (Upper Great Miami River) than the location of the impacts (Lower Great Miami River). Ohio EPA mitigation rules indicate that mitigation should occur within the same 8-digit HUC watershed, unless there are ecologically-compelling reasons to approve mitigation outside the watershed. Both Denise and Laurie generally agreed that the importance and uniqueness of the Silver Lake corridor made this decision to mitigate outside the watershed feasible. But again, everything that Atrium is prepared to offer (in cooperation with MCPD at this mitigation site) must be spelled out in a formal proposal to the Corps and Ohio EPA.

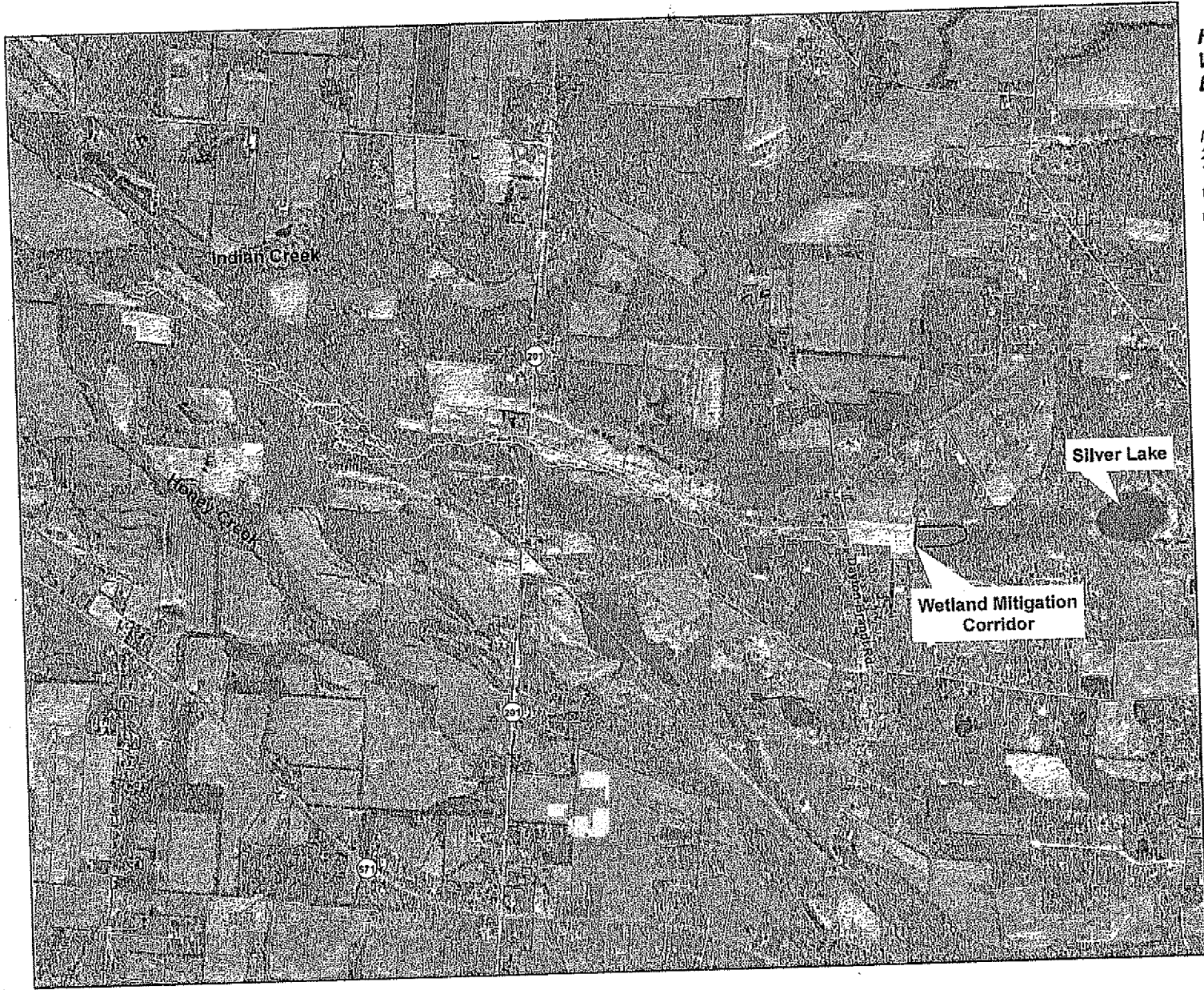
It was noted that Ohio EPA attorney Bill Fischbein is currently reviewing MCPD's conservation easement on the property at the request of Atrium's attorney, Steve Haughey. Kevin reminded the group that MCPD requires confirmation that their existing agreement would allow them to pursue a mitigation agreement with Atrium.

Group concluded with a brief tour of the two parcels (8-acre parcel with Miami Valley Hospital's mitigation and adjacent 5-acre parcel) to examine the recently-completed excavation work and further discuss and evaluate the mitigation potential for Atrium.

Meeting adjourned around 11:30 a.m.

**APPENDIX B**

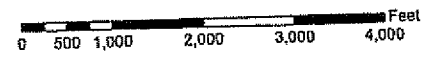
**Corridor Overview Image and  
Supporting Materials for Jurisdictional Determination**










**Honey Creek  
Watershed and  
Easements**

Miami County Park District  
2645 E. State Route 41  
Troy, Ohio  
(937) 335-6273

FDP-101



**Legend**

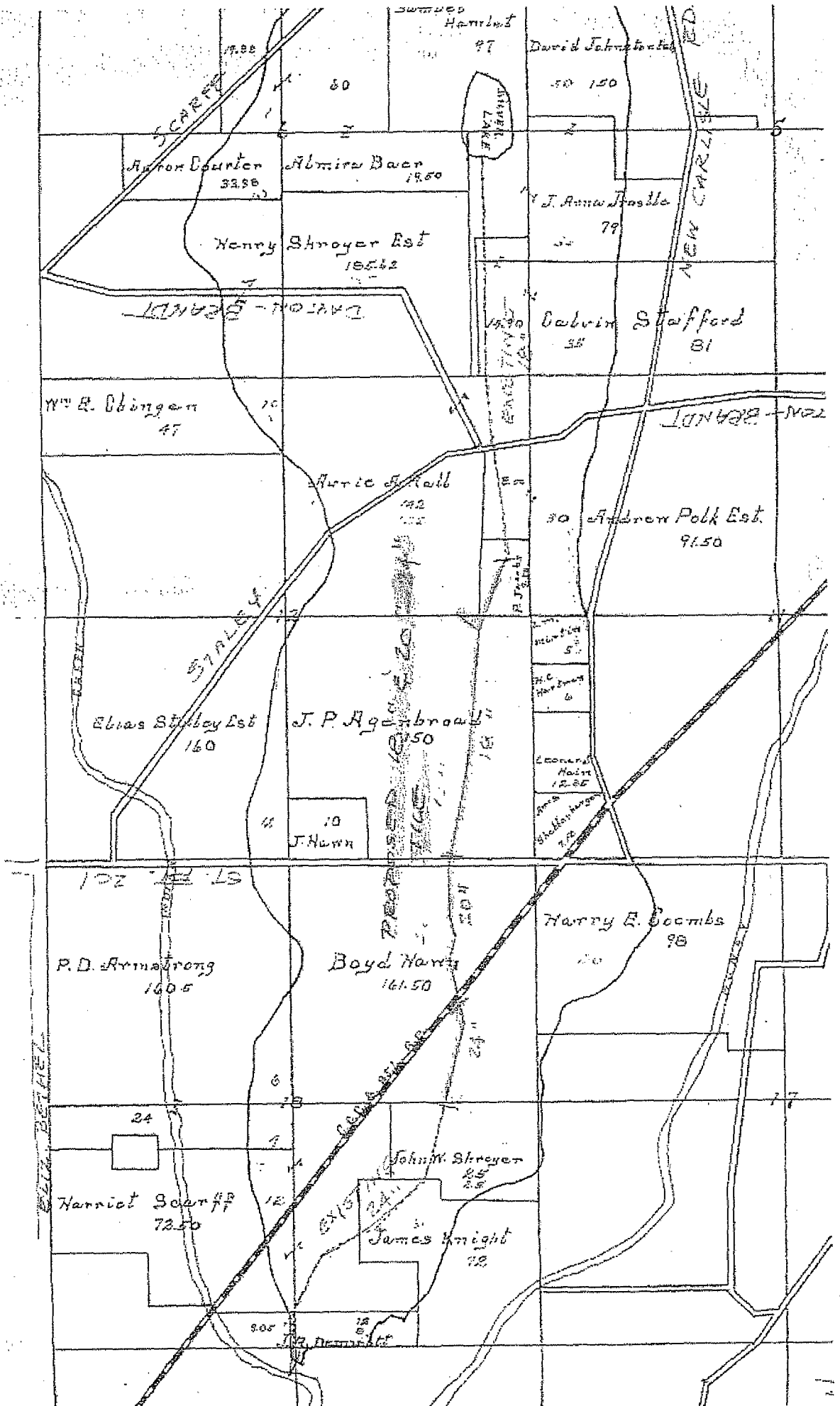
-  Potential Mitigation
-  MVH Mitigation Site
-  Indian Creek Tributary
-  County Creeks
-  Clark Conservation Easement
-  Francis Conservation Easement
-  Fredrick-Davis Cons. Easement

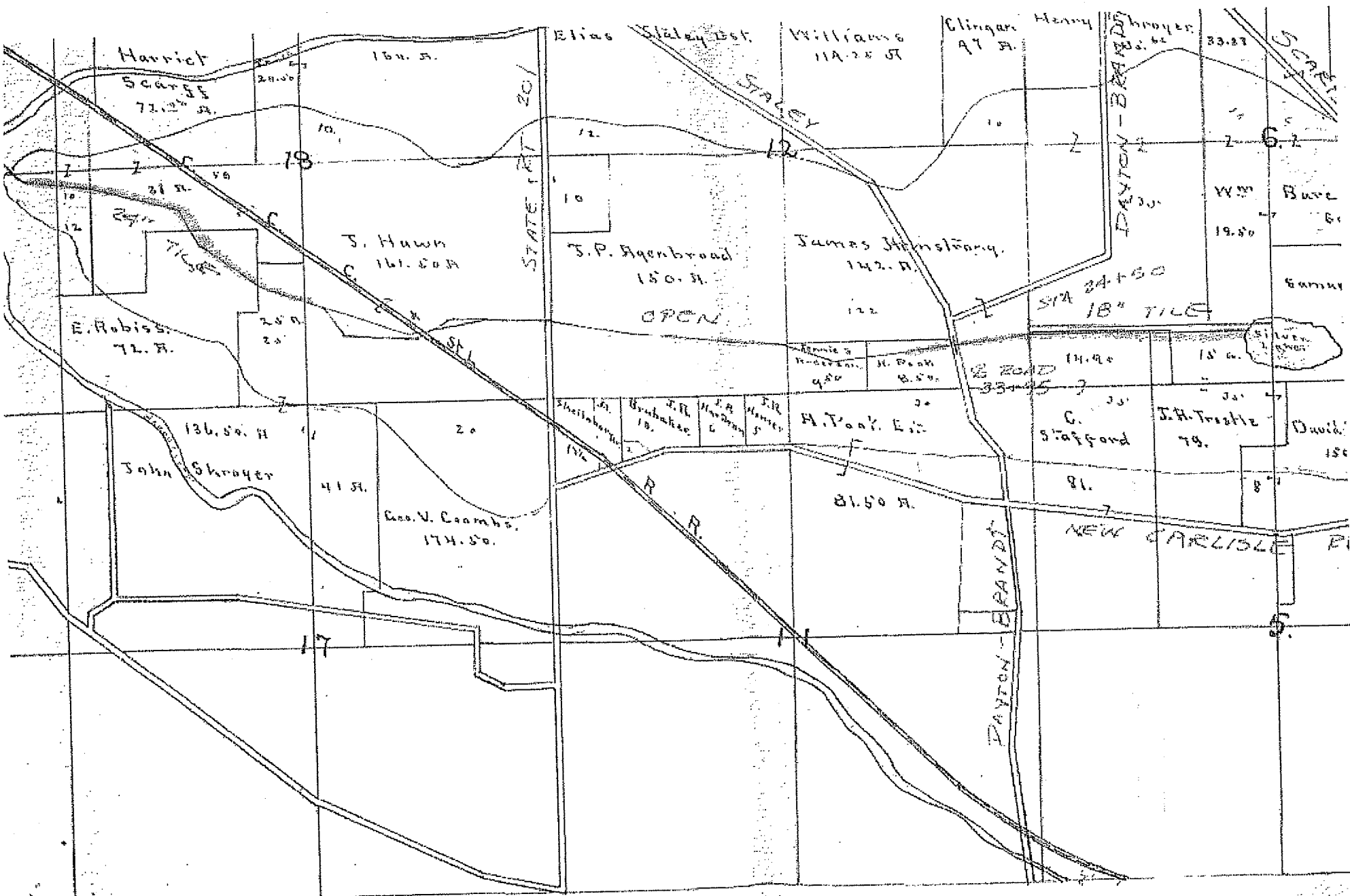
THIS DITCH WENT 40

COURT 1904

SEE DITCH BK. H. PG. 86

COURT ORDERED COMPT. TO PROCEED





Harriet Scargis  
72.2 A.

164. A.

Elias

Staley Est.

Williams  
114.25 A.

Clingman  
97 A.

Henry  
33.87

33.87

18

STATE RT. 201

STALEY

PAYTON - BRANDT

S. Hawn  
161.50 A.

J.P. Agenbroad  
150. A.

James Armstrong  
142. A.

SPR 24+50  
18" TILE

E. Robiss  
72. A.

25 A.

OPEN

H. Cook  
9.50

H. Cook  
8.50

ROAD  
14.90

15 A.

136.50 A.

41 A.

Shelburne  
18.

H. Cook, Esq.

C. Stafford

J.H. Treble  
79.

Dwight  
150

John Schroder

Geo. V. Coombs  
174.50.

81.50 A.

PAYTON - BRANDT

NEW CARLISLE R.

17

8

**APPENDIX C**

**Miami County Park District  
Deed and Conservation Easement Documents**

### DEED OF CONSERVATION EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that Lester & Marjorie L. Clark Jr., whose residence address is 8115 East New Carlisle Road, New Carlisle, Ohio 45344, respectively, the Grantors, in consideration of the sum of one dollar (\$1.00) and other good and valuable consideration, the receipt of which is hereby acknowledged, do hereby grant, bargain, sell and convey, in perpetuity, unto the MIAMI COUNTY PARK DISTRICT, Grantee, 2535 Ross Road, Tipp City, Ohio 45371, its successors and assigns, an estate, interest and easement for conservation purposes of the nature and character and extent hereinafter expressed, to be and to constitute a servitude upon the following real property of the Grantor situated in the County of Miami in the State of Ohio and being further described in the attached Exhibit A, shown on map Exhibit B.

For the purposes of accomplishing the intent of the parties hereto, Grantors covenant on behalf of themselves and their heirs, executors, administrators and assigns with Grantee and its successors and assigns to do and to refrain from doing, severally and collectively, upon Grantors' property herein described the various acts hereinafter set forth:

#### EASEMENT RESTRICTIONS

The restrictions hereby imposed upon the use of granted easement property of the Grantors, and the acts which said Grantors so covenant to do and refrain from doing upon granted easement property in connection therewith are and shall be as follows:

1. The easement property herein described shall be maintained in perpetuity as a natural area. As herein used, the term "natural area" is intended to mean that no buildings, billboards or other structures of any kind, either temporary or permanent, shall be placed or erected on the easement property, unless otherwise expressly provided hereunder. There shall be no industrial, commercial or agricultural activity on the property.
2. There shall be on or in the easement property no fillings, drilling, mining, excavating, removal of top soil, sand, gravel, rock minerals, oil or gas or other materials nor any building of roads or change in the topography of the land in any manner, other than that caused by the forces of nature or as reserved hereafter. There shall be no recreational operation of snowmobiles, dune buggies, motorcycles, all terrain vehicles or other motorized recreational vehicles. This restriction does not prohibit the development of recreational trails for hiking, cross country skiing, nature observation or other similar purposes.
3. There shall be no spraying or other application of herbicides, fungicides, rodenticides or pesticides unless necessary to protect human health and safety. Herbicides may be used for the control of state designated noxious weeds and for the control of other invasive exotic plant species.
4. No power or transmission lines may be erected, nor any interests in the easement property shall be granted for this purpose. It is the intent of this provision to grant to the Grantee such an interest in said easement property as is sufficient to prohibit the exercise of the power of eminent domain by public utility companies and any other body or person. The Grantors reserve the right to maintain and repair



existing telephone, electric, water, wells or other utility lines or mains needed to provide for the needs of the Grantors, Grantors' successors or assigns. The area needed to repair said facility shall be the minimum necessary to accomplish the task as agreed upon in writing by the Grantors and Grantee. Upon completion, the area shall be restored to its previous state or as near as practical.

5. No trees, ground cover or other vegetation shall be removed by cutting, mowing or any other activity unless approved by the Grantee. Grantee may cut or remove trees or other vegetation it determines the same to be in the best interest of maintaining the easement property as a diversity of naturally occurring habitat types and control of exotic. No non-native species shall be introduced to the property. This right of Grantee is subject to the approval of the Grantors, which approval shall not be unreasonably withheld.

6. The lands shall at all times be kept free of garbage, trash and machinery, and no other unsightly material shall be allowed to accumulate or be stored thereon, except neither Grantors nor Grantee shall have the duty to remove garbage, trash, etc. unlawfully deposited on the premises by persons acting without the consent of the Grantors. There shall be no dumping of trash, garbage or hazardous or toxic substances.

7. Each and every activity, including but not limited to construction activity, which might endanger the natural integrity or state of the easement property, is forbidden.

8. The Grantee reserves the right to periodically inspect the easement property for violations of the easement, and if upon 30 days advance written notice the Grantors have not eliminated said violations, the Grantee may remove or eliminate, at the expense of the Grantors, including attorney's fees, any violation by the Grantors of the easement. The Grantee or an authorized representative may enter upon said lands for the purpose of inspection.

9. The Grantee reserves the right to post or clearly mark the boundaries of said easement in compliance with the Grantee's policies, at the sole expense of the Grantee.

10. Cattle or non-native animals shall not be permitted on the easement property. An existing mowed bridal trail may be used for exercising of horses. Hunting or trapping is permitted as authorized under the State of Ohio legal hunting and trapping seasons. Hunting and trapping is permitted as necessary to keep animal populations within numbers consistent with the ecological balance of the property or as necessary to protect human health and safety.

11. All activities which are prohibited to be performed by the Grantors on the easement property shall not be done by any employee, agent or representative of the Grantors, nor shall the Grantors give permission to another person to perform such activities.

12. There shall be no manipulation or alteration of creeks, streams, surface or subsurface springs or other bodies of water, nor shall there be any activities on or uses of the easement property which are or would be, in the opinion of the Grantee, detrimental to water purity or quality. Restoration activities involving surface water manipulation must be approved in advance by the Ohio Environmental Protection Agency.

13. Grantors shall not conduct or permit to be conducted any type of activity which will cause trees or any other form of vegetation to be damaged, harmed or killed.

14. Grantee shall have the right to implement Best Management Practices (BMP's) designed to preserve, restore and/or enhance the natural values of the easement property. Such practices include, but are not limited to, the following intended as illustrative and not as an exhaustive list thereof:

- (a) installation of stop log structures
- (b) removal of all tile
- (c) collection of seeds and plants
- (d) planting of seeds and plants
- (e) installation of tile to enhance hydrology
- (f) control of nuisance species of plants and wildlife

Grantee shall have right of ingress and egress for the purposes of inspections and implementation of Best Management Practices. Grantee and Grantor shall determine the best location and Grantee shall be responsible for repairing any and all damages caused by vehicles or equipment entering onto Grantor's property.

15. In the event that Grantors desire to use the easement property in a manner or for a purpose that may be inconsistent with the easement, Grantor shall submit a request for such use in writing to Grantee. Grantee shall grant or deny approval of such request in writing within thirty (30) days of receipt by Grantee of Grantors' request. Grantee's failure to so respond shall constitute approval of the request. Grantee's approval of a request shall be denied only upon a reasonable determination by Grantee that the proposed use would be inconsistent with the purpose of this easement. In no event shall the denial of such a request by Grantee give rise to any claim by anyone for money damages against Grantee.

16. The property may not be divided, partitioned, subdivided or conveyed except in its current configuration, i.e. all easement parcels must be conveyed to one entity or person in their entirety.

#### RIGHTS OF THE GRANTORS

The easement granted hereunder and the covenants heretofore made are subject to the following rights of the Grantors, which are expressly reserved hereunder:

1. Except as expressly limited herein, the Grantors reserve for themselves, their heirs and assigns, all rights as owner of the easement property, including the right to use the easement property for all purposes consistent with this easement.

2. The Grantors have the right but have no duty to remove, for safety purposes and for personal use as firewood, fallen logs or dead trees in the easement area. Furthermore the Grantors have the right to use the existing field area for composting.
3. The Grantors also reserve the right but have no duty to maintain existing and control gates within the said easement areas, to use the existing mowed bridal trail and to erect additional fences on the perimeter of said areas to control trespassing from adjoining areas.
4. Except as otherwise provided for herein, Grantor bears all responsibilities, liabilities and costs of any nature and kind related to the ownership of the fee interest in the easement property. By accepting this easement, Grantee does not assume any obligations whatsoever with respect to the ownership by the Grantors of the fee interest in the easement property.

#### GENERAL PROVISIONS

1. Any forbearance by Grantee to exercise its rights under this easement in the event of any breach of any item of this easement shall not be deemed to be a waiver by Grantee of such item or of any of Grantee's rights under this easement. No delay or omission by Grantee in the exercise of any right or remedy upon any breach by Grantors shall impair such right or remedy or be construed as a waiver. Grantors waive any defense of laches, estoppel or prescription.
2. If any provision of this easement or the application thereof to any person or circumstance is found to be invalid by a court of competent jurisdiction, the remainder of the provisions of this easement or the application of such provision to persons or circumstances other than those as to whom it is found to be invalid, as the case may be, shall not be affected thereby.
3. This instrument sets forth the entire agreement of the parties with respect to the easement and supercedes all prior discussions, negotiations, understandings or agreements relating to this easement, all of which are merged herein. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment in writing signed with the due authority of each Grantor and the Grantee.
4. The covenants, terms, conditions and restrictions of this easement shall be binding upon and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors and assigns, and shall continue as a servitude in perpetuity with the easement premises.

#### ASSIGNABILITY CLAUSE

Grantee shall have the right to assign its right, title and interest in and to this conservation easement only to organizations that are authorized to acquire and hold conservation easements pursuant to Section 5301.67 *et seq.* of the Ohio Revised Code, as the same may be amended from time to time



# COZATT ENGINEERING COMPANY

CIVIL ENGINEER — LAND SURVEYOR

MICHAEL W. COZATT  
PROFESSIONAL ENGINEER STATE  
PROFESSIONAL SURVEYOR 6201

676 SWALES ROAD  
TROY, OHIO 45373  
(937) 339-1321 • (937) 648-2726

SUBDIVISIONS  
MUNICIPAL ENGINEERING  
LAND SURVEYS

November 24, 2003

## DESCRIPTION

26.021 Acres  
Conservation Easement  
Lester and Marjorie Clark to Miami County Park District

Being a 26.021 acre conservation easement area in the northwest quarter of Section 5, and the southwest quarter of Section 6, Town 2, Range 9BTMRS, Bethel Township, Miami County, Ohio, and further bounded and described as follows:

Beginning at an iron pin found at the southwest corner of the southwest quarter of Section 6 and marking the true place of beginning;

thence North 02 deg.-25'-56" East for 358.12 ft.  
to a 5/8" dia. capped iron pin set;

thence North 87 deg.-27'-54" East for 1679.08 ft.  
to a concrete fence post;

thence South 01 deg.-42'-35" West for 514.57 ft.  
to a concrete fence post;

thence North 87 deg.-01'-32" West for 316.85 ft.  
along the north line of Hills and Dales  
Subdivision No.2 to a concrete fence post;

thence South 02 deg.-55'-40" West for 393.54 ft.  
along the west line of said subdivision  
to a 5/8" dia. capped iron pin set;

thence North 81 deg.-49'-56" West for 744.06 ft.  
to a 5/8" dia. capped iron pin set;

thence North 02 deg.-57'-06" West for 167.56 ft.  
to a 5/8" dia. capped iron pin set;

thence North 88 deg.-04'-36" West for 340.05 ft.  
to a 5/8" dia. capped iron pin set;

thence South 02 deg.-48'-36" West for 142.02 ft.  
to a 5/8" dia. capped iron pin set;

thence North 84 deg.-50'-36" West for 263.96 ft.  
to a 5/8" dia. capped iron pin set;

thence North 02 deg.-45'-28" East for 292.89 ft.  
to the iron pin found at the place of  
beginning.

Containing a total of 26.021 acres, and subject to all legal  
easements, rights-of-way, and restrictions of record.

According to a field survey performed by Michael W. Cozatt,  
Professional Surveyor 6001, 476 Swalles Road, Troy, Ohio 45373,  
on November 25, 2003, as filed in Vol. 48, Page 1 of the Miami  
County Engineer's Record of Land Surveys.

Pic:34003



**ADDENDUM TO DEED OF CONSERVATION EASEMENT**

WHEREAS, Lester & Marjorie L. Clark, Jr., whose residence address is 8115 East New Carlisle Road, New Carlisle, Ohio 45344, respectively the Grantors, executed a Deed of Conservation Easement dated March 15, 2004, for the sum of One Dollar (\$1.00) and other good and valuable consideration, which thereby granted, bargained, sold and conveyed, in perpetuity, to the MIAMI COUNTY PARK DISTRICT, Grantee, 2535 Ross Road, Tipp City, Ohio 45371, its successors and assigns, an estate, interest, and easement for conservation purposes upon certain real property of the Grantors, situated in the County of Miami, in the State of Ohio, described in Exhibit A attached to the Deed of Conservation Easement;

WHEREAS, Grantee desires to exercise rights under the Deed of Conservation Easement to construct wetlands on the real property, to be maintained in perpetuity as a natural area, thereby improving water quality and enhancing the value of the real property as a natural resource for Miami County;

WHEREAS, in the process of discussing its interest in constructing wetlands on the real property, the Grantee has been informed by Ohio EPA that the Agency is concerned that Paragraph 15 in the Deed of Conservation Easement might potentially be used in the future, wittingly or unwittingly, as a vehicle to damage or destroy wetlands constructed on the real property;

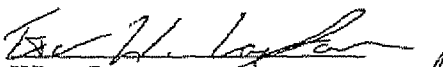

WHEREAS, Ohio EPA has informed the Grantee that Paragraph 15 must be removed or somehow limited so as to protect against the potential risk of it being used to damage or destroy wetlands constructed on the real property; and

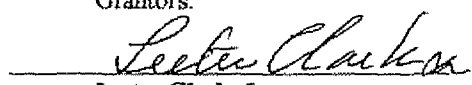
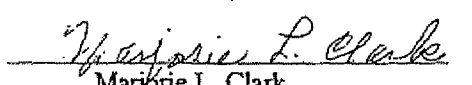
WHEREAS, Grantors and Grantee both state and acknowledge that it is not the intention of Paragraph 15 to be so used, but Grantor and Grantee nevertheless both agree that Grantors will execute this Addendum in order to memorialize their intentions.

NOW, THEREFORE, in the interest of promoting the construction of wetlands on the real property and the preservation thereof in perpetuity as a valuable and natural resource, and in exchange for the sum of five hundred dollars (\$500.00) paid to Grantors, the receipt of and amount of which is acknowledged hereunder as due and fair consideration, the Grantors hereby agree that they will not submit a request as provided in Paragraph 15 that might reasonably be construed as promoting, facilitating or otherwise allowing damage or destruction to wetlands to be constructed on the real property. Grantors also agree to provide Ohio EPA a copy of any request sent to Grantee under Paragraph 15, addressed to Ohio EPA, P.O. Box 1049, Columbus, Ohio 43216-1049, Attn: 401 Manager.

IN WITNESS WHEREOF, the Grantors hereunto have set their hands this 6 day of February 2009.

SIGNED AND ACKNOWLEDGED IN THE PRESENCE OF:

  
Witness  
  
Witness

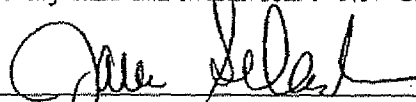
Grantors:  
  
Lester Clark, Jr.  
  
Marjorie L. Clark

STATE OF OHIO            )  
                                  )     SS:  
MIAMI COUNTY            )

Before me, a notary public in and for said county and state, personally appeared the above-named Grantors who acknowledged that they did sign the foregoing instrument, and that the same is their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and official seal at New Carlisle, Ohio this 6 day of February 2009.

JANEEN SELANDERS, Notary Public  
In and for the State of Ohio  
My Commission Expires 06/06/11

  
\_\_\_\_\_  
Notary Public  
My Commission Expires: 06/06/11

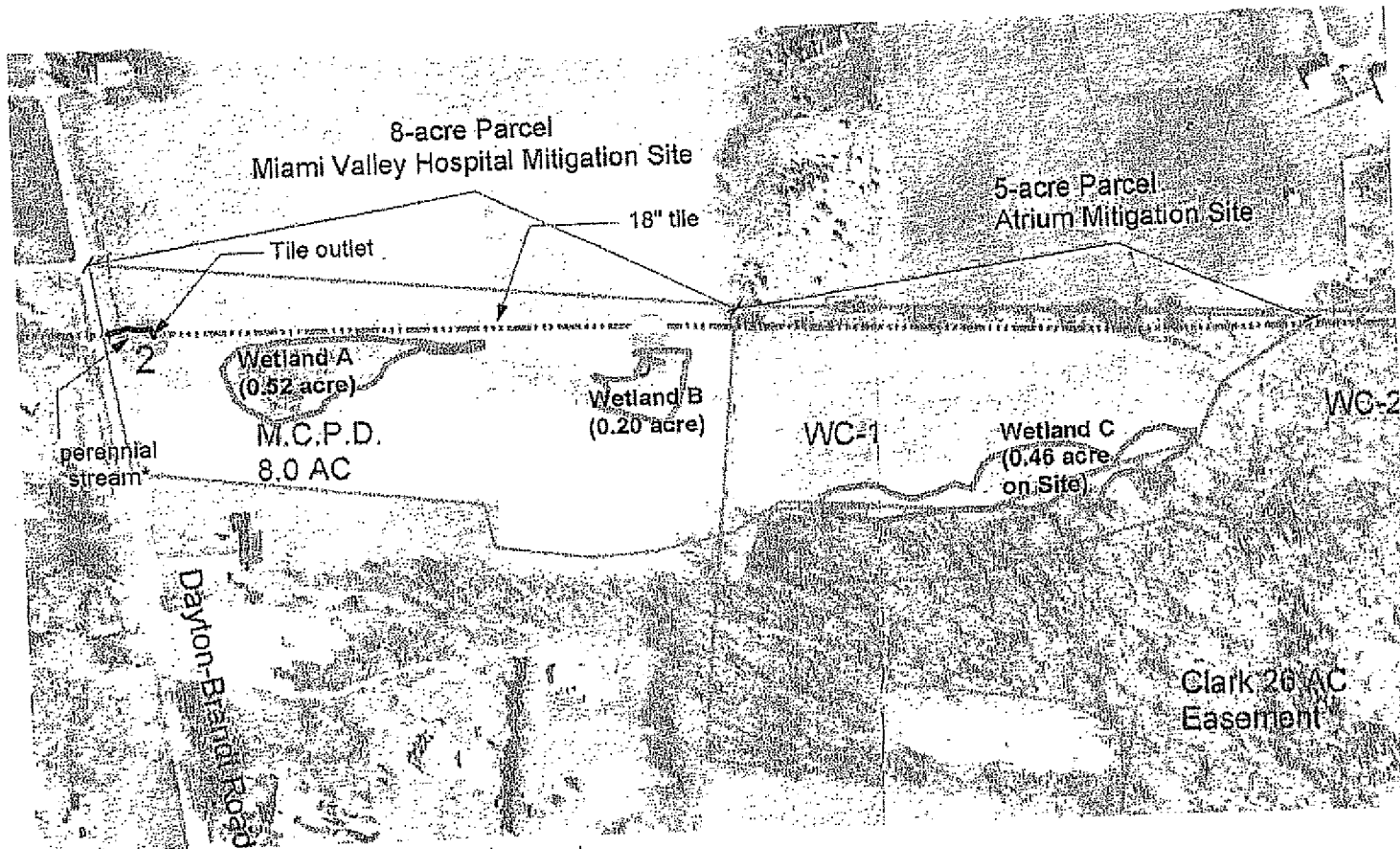


**APPENDIX D**  
**Construction Drawings**




**APPENDIX E**

**Project Area Wetland Delineation Map**

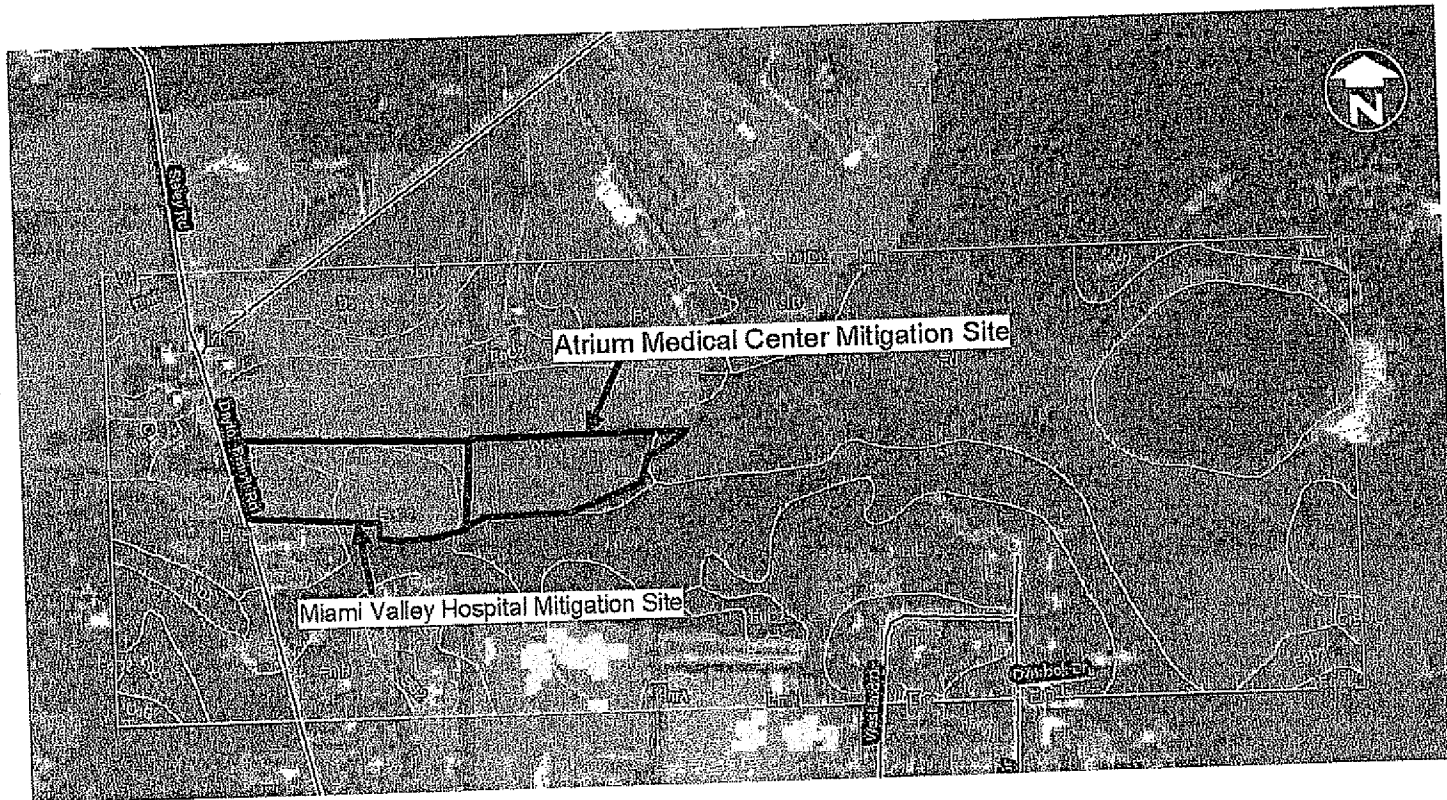


\* Filled by County during recent culvert replacement

	1" = -200'	<b>Appendix E. Project Area Wetland Delineation</b>  Atrium Mitigation Site NEW CARLISLE, OHIO
	12/30/2008	
	MAD	
Source: Aerial Imagery provided by Miami County Park District		

**APPENDIX F**

**Soils Map**



- KEY:**
- Ed - Edwards muck
  - EmB - Eldean silt loam, 2-6% slopes
  - EoC2 - Eldean-Casco gravelly loams, 6-12% slopes, moderately eroded
  - LrE2 - Lorenzo-Rodman gravelly loams, 18-50% slopes, moderately eroded
  - Wt - Westland silty clay loam

<b>Appendix F. Soil Map</b>		
<b>ATRIUM MEDICAL CENTER MITIGATION SITE</b> NEW CARLISLE, OHIO (MIAMI COUNTY PARK DISTRICT)		
<b>MAD</b> Scientist <small>ASSOCIATES LLC</small>	MAD	12/30/2008
	Source: USDA, Web Soil Survey (2008) New Carlisle, Ohio topographic quadrangle	

**APPENDIX G**

**Planting Details - Plant Species and Installation**

Plant List - Atrium Mitigation Wetland Enhancement

Common Name	Species	form	Indicator	C of C*	vendor	notes	relative abundance**	wetland type	shade	quantity
AMERICAN SYCAMORE	<i>Platanus occidentalis</i>	tree	FACW-	7	RPM	present on 5-acre	-	-	-	25
SWAMP WHITE OAK	<i>Quercus bicolor</i>	tree	FACW+	7	RPM	-	med-high	forested	-	75
PIN OAK	<i>Quercus palustris</i>	tree	FACW	5	RPM	-	med-high	forested	-	55
SILVER MAPLE	<i>Acer saccharinum</i>	tree	FACW	3	RPM	-	med-high	forested	-	75
BLACKGUM	<i>Nyssa sylvatica</i>	tree	FAC	7	RPM	-	low-med	forested	-	29
SHELLBARK HICKORY	<i>Carya laciniosa</i>	tree	FAC	7	RPM	-	low	forested	-	25
										284
SPICEBUSH	<i>Lindera benzoin</i>	shrub	FACW	5	RPM	-	med-high	forested	shade	65
BLUE-BEECH	<i>Carpinus caroliniana</i>	sm tree	FAC	5	RPM	-	low	forested	shade	26
BLACK CHOKEBERRY	<i>Aronia melanocarpa</i>	shrub	FAC	5	RPM	-	low-med	forested	partial	35
										126
BUTTONBUSH	<i>Cephalanthus occidentalis</i>	shrub	OBL	6	RPM		med-high	scrub-shrub	sun	70
SHRUBBY CINQUEFOIL	<i>Potentilla fruticosa var.</i>	shrub	FACW	10	RPM	present in upstream fen	med-high	emergent - fen	sun	70
SWAMP ROSE	<i>Rosa palustris</i>	shrub	OBL	5	RPM	present on 5-acre	med	scrub-shrub	sun	50
										190
PORCUPINE SEDGE	<i>Carex hystericina</i>	sedge	OBL	5	JFNew		med	emergent - fen	sun	72
RIDDELL'S GOLDENROD	<i>Solidago riddellii</i>	forb	OBL	8	JFNew	present on 5-acre	med	emergent - wet prairie	sun	114
TUSSOCK SEDGE	<i>Carex stricta</i>	sedge	OBL	5	JFNew	-	low-med	emergent - wet prairie	sun	76
GOLDEN ALEXANDERS	<i>Zizia aurea</i>	forb	FAC	6	JFNew	-	-	-	sun	72
										334
SEDGE MEADOW		seed mix			JFNew	-	-	-	-	1 acre
SLOPE STABILIZATION		seed mix			JFNew	-	-	-	-	.25 acre
SWALE		seed mix			JFNew	-	-	-	-	.25 acre

\* Coefficient of Conservatism - Index that measures floristic quality/conservatism on a scale from 0 - 10

\*\* As found in natural wetlands in Ohio



## **Planting Instructions for Trees and Shrubs**

### **Specific Instructions for Planting**

1. Dig a pit 3 times the diameter of the container (~ 30 inches for 3 gallon container)
2. Remove container and loosen roots if roots are tightly compressed, or "potbound"
3. Seat the tree/shrub in the pit such that the surface is level with the surrounding soil.
4. Backfill pit with original soil and "tamp down" gently by compressing soil around the roots
5. Apply slow release fertilizer to the soil surface at recommended rate (~15 grams or 1 tbsp./tree)
6. Install weed barrier mat, securing with nine, 1-gauge flat top staples, six inches in length
7. Place protective tree wrap around stem
8. Water with a slow flow until soil is saturated around tree

### **General Instructions for Planting**

1. Plant trees/shrubs in spring between March 1 and April 30 or in fall between October 20 and December 10.
2. Space trees and shrubs in a scattered fashion or in clumps within their planting zone, offsetting plantings and generally allowing a 20-30 ft. radius for trees and a 10-15 ft. radius for shrubs.

# SLOPE STABILIZATION SEED MIX

JFNEW OFFERS FULL INSTALLATION SERVICES! VISIT JFNEW.COM OR CONTACT YOUR LOCAL JFNEW OFFICE FOR MORE INFORMATION.

This grass mix is best suited for sites with slopes where erosion control is needed. Applications include embankments, dams and levees. This seed mix will include at least 5 of 7 native permanent grass species. To install this seed mix, see the "Installation Instructions for Seed Mixes" section.



Botanical Name	Common Name	Oz./Acre
<b>Permanent Grasses</b>		
<i>Andropogon gerardii</i>	Big Bluestem	48.00
<i>Bouteloua curtipendula</i>	Side-Oats Grama	32.00
<i>Carex sparganioides v. cephaloidea</i>	Rough-Clustered Sedge	4.00
<i>Elymus canadensis</i>	Canada Wild Rye	32.00
<i>Panicum virgatum</i>	Switch Grass	8.00
<i>Schizachyrium scoparium</i>	Little Bluestem	32.00
<i>Sorghastrum nutans</i>	Indian Grass	32.00
<b>Total</b>		<b>188.00</b>
<b>Temporary Cover</b>		
<i>Avena sativa</i>	Common Oat	512.00
<i>Lolium multiflorum</i>	Annual Rye	222.00
<b>Total</b>		<b>734.00</b>

Mix Statistics				
Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
Forbs				0.00%
Grasses	11.75	2230272	51.2	100%
<b>Total Natives</b>	<b>11.75</b>	<b>2230272</b>	<b>51.2</b>	<b>100%</b>
Non-Native Forbs				
Cover	45.88	7634761.2	175.27	
<b>Total</b>	<b>57.63</b>	<b>9865033.2</b>	<b>226.47</b>	

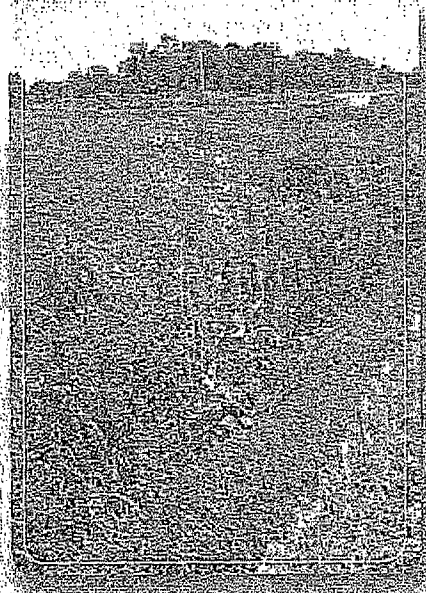
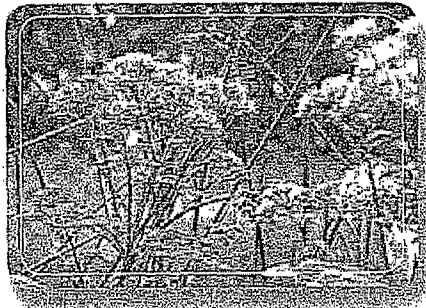
Sold in 1/4 Acre Increments		
1/4 Acre	1/2 Acre	1 Acre
\$275.00	\$165.00	\$88.00



# SWALE SEED MIX

JFNEW OFFERS FULL INSTALLATION SERVICES! VISIT [JFNEW.COM](http://JFNEW.COM) OR CONTACT YOUR LOCAL JFNEW OFFICE FOR MORE INFORMATION.

A swale is a drainage ditch or natural depression along a roadside, sidewalk or driveway which may or may not lead to a retention pond. The native plants used in our "Swale Seed Mix" help filter pollutants from yard and road runoff. Homeowners can blend landscaping into their yard with the natives in the swale. This mix can also be applied to areas in a yard which temporarily retain water after a rain. Used in this way, homeowners can create rain gardens with beautiful native wildflowers, grasses and sedges. This seed mix will include at least 7 of 12 native permanent grass and sedge species and 10 of 13 native forb species. To install this seed mix, see the "Installation Instructions for Seed Mixes" section.



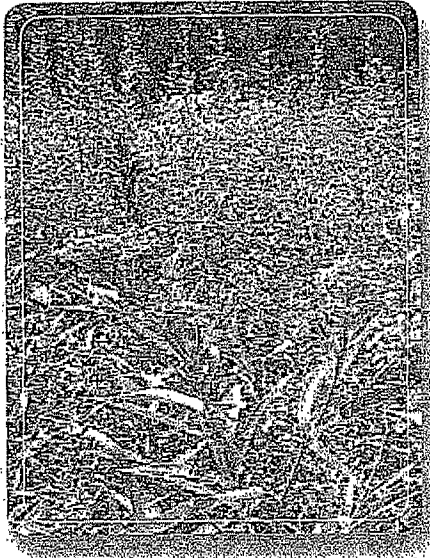
Botanical Name	Common Name	Oz./Acre
<b>Permanent Grasses/Sedges</b>		
<i>Andropogon gerardii</i>	Big Bluestem	12.00
<i>Carex comosa</i>	Bristly Sedge	2.00
<i>Carex cristatella</i>	Crested Oval Sedge	2.00
<i>Carex lurida</i>	Bottlebrush Sedge	2.50
<i>Carex sparganioides v. cephaloidea</i>	Rough Clustered Sedge	3.00
<i>Carex vulpinoidea</i>	Brown Fox Sedge	3.00
<i>Elymus virginicus</i>	Virginia Wild Rye	8.00
<i>Glyceria striata</i>	Fowl Manna Grass	1.00
<i>Panicum virgatum</i>	Switch Grass	2.00
<i>Scirpus atrovirens</i>	Dark Green Rush	2.00
<i>Scirpus cyperinus</i>	Wool Grass	0.50
<i>Spartina pectinata</i>	Prairie Cord Grass	2.50
<b>Total</b>		<b>40.50</b>
<b>Temporary Cover</b>		
<i>Avena sativa</i>	Common Oat	360.00
<i>Lolium multiflorum</i>	Annual Rye	28.00
<b>Total</b>		<b>388.00</b>
<b>Forbs</b>		
<i>Alisma spp.</i>	Water Plantain (Various Mix)	1.00
<i>Asclepias incarnata</i>	Swamp Milkweed	2.00
<i>Aster novae-angliae</i>	New England Aster	0.50
<i>Coreopsis tripteris</i>	Tall Coreopsis	2.00
<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed	0.25
<i>Iris virginica</i>	Blue Flag	3.00
<i>Liatris spicata</i>	Marsh Blazing Star	2.00
<i>Lobelia cardinalis</i>	Cardinal Flower	0.25
<i>Lobelia siphilitica</i>	Great Blue Lobelia	0.50
<i>Sagittaria latifolia</i>	Common Arrowhead	0.75
<i>Silphium terebinthinaceum</i>	Prairie Dock	1.00
<i>Verbena hastata</i>	Blue Vervain	1.00
<i>Zizia aurea</i>	Golden Alexanders	0.75
<b>Total</b>		<b>15.00</b>

Mix Statistics				
Native Component	PLS lbs/Acre	PLS Seeds/Acre	PLS Seeds/Shaft	% of Native Mix
<b>Forbs</b>	0.94	732,679	16.82	31.68%
<b>Grasses</b>	2.53	1,579,921	36.27	68.32%
<b>Total Natives</b>	3.47	2,312,600	53.09	100%
<b>Non-Native Forbs</b>				
<b>Cover</b>	24.25	3,322,321	76.27	
<b>Sold in 1/4 Acre Increments</b>				
1/4 Mix - 1/4 Acre	1/2 Acre	1 Acre		
\$525.00	\$301.00	\$171.00		

# SEDE MEADOW SEED MIX

JFNEW OFFERS FULL INSTALLATION SERVICES! VISIT JFNEW.COM OR CONTACT YOUR LOCAL JFNEW OFFICE FOR MORE INFORMATION.

A grass, sedge and wildflower mix for level sites with year-round saturated soil conditions, this mix creates a diversified habitat, offering a variety of cover and food options for wildlife. Many of the plants attract butterflies, some even attracting hummingbirds. This seed mix will include at least 11 of 18 permanent grass and sedge species and 27 of 31 native forb species. To install this seed mix, see the "Installation Instructions for Seed Mixes" section.



Botanical Name	Common Name	Oz./Acre
<b>Permanent Grasses/Sedges/Forbs</b>		
<i>Colamagrostis canadensis</i>	Bluejoint Grass	0.50
<i>Carex comosa</i>	Bristly Sedge	1.50
<i>Carex cristatella</i>	Crested Oval Sedge	1.50
<i>Carex frankii</i>	Bristly Cattail Sedge	3.00
<i>Carex lupulina</i>	Common Hop Sedge	2.50
<i>Carex lurida</i>	Bottlebrush Sedge	4.00
<i>Carex stipata</i>	Common Fox Sedge	1.00
<i>Carex vulpinoidea</i>	Brown Fox Sedge	4.00
<i>Elymus virginicus</i>	Virginia Wild Rye	30.00
<i>Glyceria striata</i>	Fowl Manna Grass	0.50
<i>Juncus effusus</i>	Common Rush	0.25
<i>Leersia oryzoides</i>	Rice Cut Grass	1.25
<i>Panicum virgatum</i>	Switch Grass	1.50
<i>Scirpus atrovirens</i>	Dark Green Rush	0.75
<i>Scirpus pendulus</i>	Red Bulrush	0.25
<i>Scirpus pungens</i>	Chalkmaker's Rush	1.00
<i>Scirpus validus</i>	Great Bulrush	4.00
<i>Spartina pectinata</i>	Prairie Cord Grass	2.00
<b>Total</b>		<b>59.50</b>

**Temporary Cover**

<i>Avena sativa</i>	Common Oat	372.00
<b>Forbs</b>		
<i>Ailisma</i> spp.	Water Plantain (Various Mix)	2.00
<i>Angelica atropurpurea</i>	Great Angelica	4.00
<i>Asclepias incarnata</i>	Swamp Milkweed	1.00
<i>Aster lanceolatus</i>	Panicled Aster	0.25
<i>Aster novae-angliae</i>	New England Aster	0.50
<i>Aster puniceus</i>	Bristley Aster	1.00
<i>Aster umbellatus</i>	Flat-Top Aster	0.25
<i>Bidens cernua</i>	Nodding Swamp Marigold	2.00
<i>Coreopsis tripteris</i>	Tall Coreopsis	2.50
<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed	1.00
<i>Eupatorium perfoliatum</i>	Common Boneset	0.50
<i>Filipendula rubra</i>	Queen of the Prairie	0.25
<i>Gentiana andrewsii</i>	Bottle Gentian	0.25
<i>Helenium autumnale</i>	Sneezeweed	2.00
<i>Hibiscus laevis</i>	Smooth Rose Mallow	2.00
<i>Iris virginica</i>	Blue Flag	3.00
<i>Liatis spicata</i>	Marsh Blazing Star	2.50
<i>Lobelia cardinalis</i>	Cardinal Flower	0.25
<i>Lobelia siphilitica</i>	Great Blue Lobelia	2.00
<i>Ludwigia alternifolia</i>	Seedbox	0.25
<i>Physostegia virginiana</i>	Obedient Plant	0.25
<i>Pycnanthemum virginianum</i>	Common Mountain Mint	0.50
<i>Sagittaria latifolia</i>	Common Arrowhead	2.00
<i>Senna hebecarpa</i>	Wild Senna	0.75
<i>Silphium perfoliatum</i>	Cup Plant	3.00
<i>Sparganium eurycarpum</i>	Common Bur Reed	4.00
<i>Spiraea alba / Spiraea tomentosa</i>	Meadowsweet / Steeple Bush	0.25
<i>Thalictrum dasycarpum</i>	Purple Meadow Rue	2.50
<i>Verbena hastata</i>	Blue Vervain	2.00
<i>Vernonia</i> spp.	Ironweed (Various Mix)	1.00
<i>Zizia aurea</i>	Golden Alexanders	1.00
<b>Total</b>		<b>44.75</b>

**Mix Statistics**

Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
<b>Forbs</b>	2.80	2,930,717	67.28	61.28
<b>Grasses</b>	3.72	1,851,736	42.51	38.71
<b>Total Natives</b>	6.52	4,782,452	109.79	100%
<b>Cover</b>	73.25	3,022,628	69.39	
<b>Total</b>	79.77	7,805,080	79.18	

**Sold In 1/4 Acre Increments**

1/4 Acre	1/2 Acre	1/4 Acre
\$1,250.00	\$750.00	\$400.00



# INSTALLATION INSTRUCTIONS FOR SEED MIXES

JFNew offers complete design, planting, seeding, management and monitoring services for native prairie, wetland and woodland installations. These services can be provided for large or small projects throughout the Midwest. We also offer site management services such as controlled burning, erosion control and exotic species control.

For those of you who are more hands-on, we have prepared the following general installation recommendations. Please note that the specific characteristics of each site play a role in how these general techniques should be implemented.



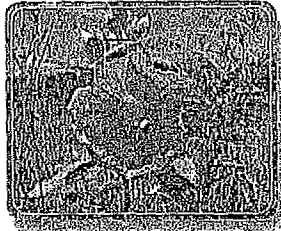
## General Recommendations

Restoring native plant communities and creating attractive, dynamic landscapes using native plants is a challenging and fun pursuit. However, to successfully achieve your project's goals, many variables must be understood and considered. We recommend that you consult with restoration and landscape experts before you start your project. It could save you a great deal of time, frustration and money.

The successful establishment of native plant communities rests on six major factors:

1. selection of a suitable site
2. appropriate materials selection
3. appropriate site preparation
4. proper installation technique
5. post-installation site management
6. time

During the first 6 to 12 months of a seeding project, it may be difficult to differentiate between the germinated native seed and undesirable weeds. Although some of the wildflower and grass species will be recognizable within the first year, it may take two to four years until the native plant community is sufficiently established to be recognized by most people.



## Management of Native Plant Communities

For optimal establishment, a newly seeded prairie should receive the equivalent of one inch of water per week for the first six to eight weeks, either via rainfall or irrigation. On small sites, watering is always beneficial, especially during extended dry periods while seeds are germinating and plants are becoming established.

Do not pull weeds while seed is germinating and seedlings are establishing or desirable plants may be uprooted with the weeds. Weeds also provide fuel for burning during the first few years of prairie establishment.

Controlled burns are one of the most effective prairie management tools. Burning is essential to the long-term maintenance of your prairie. Burns should be conducted only by experienced persons who are properly equipped and trained in fire management techniques and safety.

- Conduct burns from mid-October through April.
- Burn your prairie annually for the first two to three years and every fifth year thereafter if possible. If there is insufficient growth

to sustain a good burn, the burn may be delayed until the second year.

- Large sites should be divided into sections and only one section burned each year. This enhances prairie diversity, leaves habitat undisturbed and promotes a safer, more easily controlled burn.
- If burning is not practical, mowing may be substituted. Mow in late fall annually the first three years and every third year thereafter.
- Exotic, invasive species may need to be aggressively managed with the appropriate herbicides.

Although native plants require the same care and attention as non-native, cultivated varieties in the first few years, once established, native plants should survive and thrive for many years with little maintenance.



## Prairie Seed Installation Recommendations

### Optimum seeding time:

October 1 (fall) to May 15 (late spring)

(Seeding can be done outside of this window but establishment may take longer. Do not seed during the summer when soil moisture and rainfall may be limited.)

### Seedbed preparation:

Existing vegetative growth should be removed or killed with herbicides. Surface till the seedbed to a depth of two to four inches. If the ground is wet, delay tilling until the soil dries enough to break apart when tilled. Lightly compact the tilled soil with a roller, cultipacker or similar implement. Tilling can usually be omitted if using a no-till seed drill.

### Sowing seed:

Sow seed by hand or with a broadcaster and press into the soil with a roller, cultipacker or similar equipment. Do not cover seed more than ¼" deep. If not already included in the seed mix, plant a cover crop of seed oats at 32 pounds per acre and annual ryegrass at 10 pounds per acre with the seed. If using a no-till seed drill, follow the manufacturer's recommendations, being careful not to cover the seed more than ¼" deep. A one-inch thick mulch layer of crimped straw is recommended on erosion-prone areas.



## Wetland Seed Installation Recommendations

### Optimum seeding time:

October 1 (fall) to May 15 (late spring)

(Seeding can be done outside of this window but establishment may take longer. Do not seed during the summer when soil moisture and rainfall may be limited.)

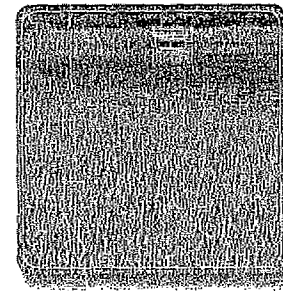
Before you plant, be sure surrounding soils are stabilized and cannot erode into the wetland. If the slopes are newly constructed and exposed, the germination and growth of your wetland seeds can be severely inhibited by siltation, sedimentation and cloudy water.

- Vegetation on surrounding slopes is the best protection from erosion damage. A quick-growing cover crop such as oats, annual ryegrass or turf grasses is acceptable, but a seeding of permanent native species is advised for optimal long-term stabilization and natural appeal. Call JFNew for recommendations.

- Other controls such as silt fences, erosion control blankets, straw mulches and straw bale dams should be installed as required to protect your wetland.

- The type of soil substrate is important to planting success. A heavy clay substrate is not conducive to seed germination and growth. You should consider incorporating topsoil, peat, compost or black dirt into the substrate before planting if your soil is heavy or nutrient-poor.

- Make sure required permits (if any) have been obtained.



### If wetland is temporarily dry:

Successful planting can be accomplished by planting when the wetland is dry. If the wetland has not naturally dried down then pumping out the water or using outlet water controls (if available) may be appropriate. Remember to obtain any required permits.

- Scarify the soil surface by shallow tilling or raking.
- Seed that is packaged wet should be sown in the lower elevations of the wetland where water levels will be deeper. Dry-packaged seed should be sown on the higher elevations but can overlap into the wet-seed areas.
- Press seed firmly into the soil using a roller, cultipacker or similar equipment. Very light

raking is an acceptable alternative, but be careful to not cover seed more than ¼" deep.

- Restore water level or wait for normal rainfall to bring water level up after seeding. If feasible, use outlet controls to maintain water level depths between ½" and 6" until seed germinates and wetland vegetation is well established.

### If wetland is wet:

In instances where water level control is not possible, satisfactory results may be obtained by following the techniques listed below.

- Sow wet-packaged seed into 4" to 6" of standing water. Mixing seed with damp clay balls aids in distribution and anchoring of seed in desired locations.

- Rake or till lightly on area 6" to 10" above waterline elevation (actual width of seeding area along shore will vary with degree of shoreline slope). If undesirable weed growth is present, mow or kill before tilling.

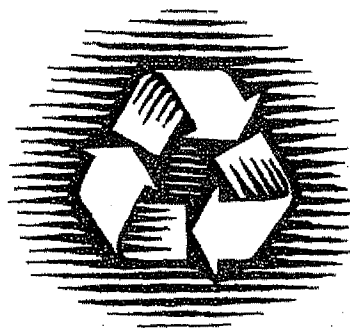
- Sow dry-packaged seed in areas at and above waterline. If soil moisture conditions permit, press seed firmly into the soil using a roller, cultipacker or similar equipment. Use caution so as not to cover seed more than ¼" deep.

### Winter sowing:

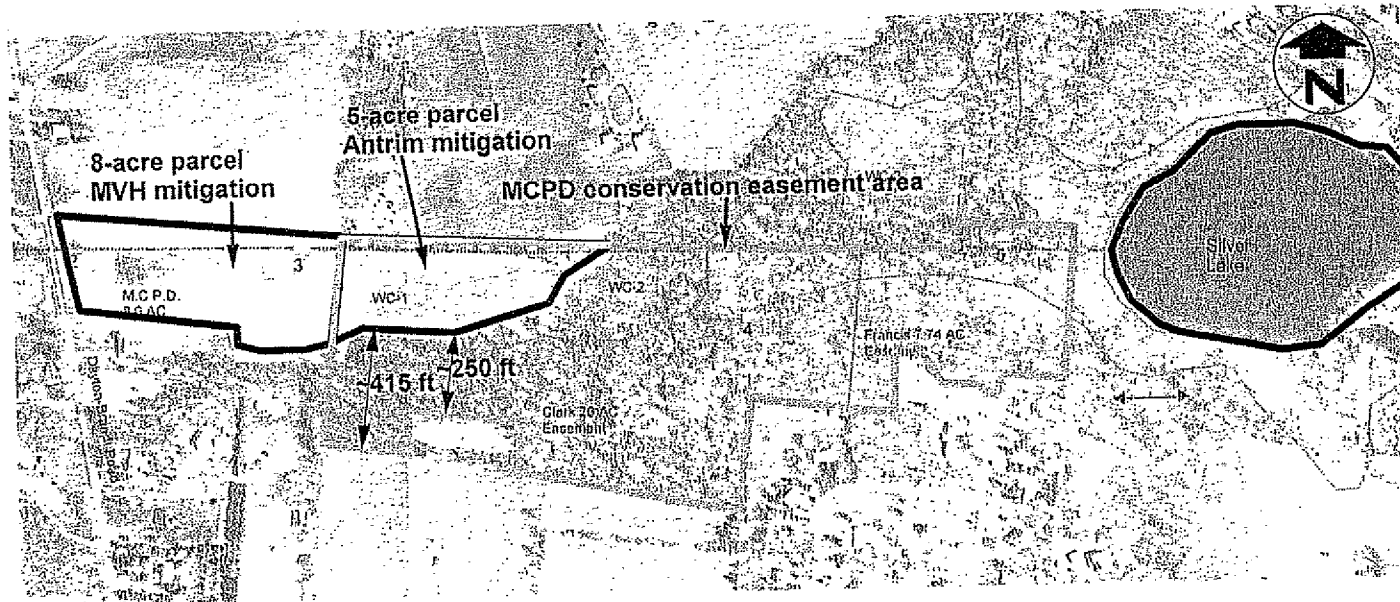
Successful planting can also be accomplished from winter seeding. Sow wet and dry-packaged seed in the zones as described above directly on bare ground during a winter thaw or on old, frozen snow (do not apply to loose, newly-fallen snow due to the potential for wind loss). Normal freezing and thawing will create openings in the ground, allowing the seed to work its way naturally into the soil. The seed will be in place to germinate when conditions are right in the spring.



*Specialists in*  
**Ecological  
& Wetland  
Consulting**  
Est. 1998



All pages printed on recycled paper  
(100% post-consumer content)



**Appendix B. Corridor Overview Image**

**Silver Lake Wetland Enhancement Corridor**  
**NEW CARLISLE, OHIO**



JDS

3/2/2009