Lake County
Forest Preserves

General Offices
1899 West Winchester Road
Libertyville, Illinois 60048
847-367-6640 • Fax: 847-367-6649
www.LCFPD.org

DATE: December 4, 2023

Agenda Item # 10.8

MEMO TO: Paras Parekh, Chair
Planning Committee

FROM: Pati Vitt
Director of Natural Resources

RECOMMENDATION: Recommend approval of a Resolution approving an Intergovernmental Agreement with the Lake County Stormwater Management Commission (SMC) to use Wetland Restoration Funds for the Grainger Woods Hydrologic Restoration Project.

STRATEGIC DIRECTIONS SUPPORTED: Conservation; Organizational Sustainability

FINANCIAL DATA: Approving this Agreement will provide the District $354,695.00 from SMC to support restoration of a portion of Grainger Woods Conservation Preserve. As proposed, the District's matching contribution is $376,540.00. Land value and the cost of prior planning studies (collectively valued at $293,060.00) may be used by the District as part of its project match. The remaining project match will come from (i) cash in the amount of $12,350.00 from the Farmland Management Fund (28644000-705100-62805) and (ii) in-kind services from District staff time to implement the project, valued at $71,130.00.

BACKGROUND: The Lake County Watershed Development Ordinance, managed and enforced by SMC, requires mitigation of impacts to isolated wetlands throughout the county. A fee-in-lieu option is provided to developers that impact wetlands, who may, in lieu of performing wetland mitigation, pay a fee to SMC. SMC collects these funds and periodically issues project requests seeking partners to use the funds on wetland mitigation activities that will offset the developers' impacts. In March of 2022, SMC advertised a Request For Proposals to fulfil wetland mitigation needs within the Des Plaines River watershed. District staff submitted a proposal that would provide for the restoration of wetlands and adjacent upland buffer areas with a 52.3-acre project area encompassing a portion of Grainger Woods (34.2 acres) and the adjacent George M. Covington Conservation Easement parcels (18.1 acres). The proposed project was accepted by SMC. The next step is for the District and SMC to approve an Intergovernmental Agreement for the project, including the transfer of wetland restoration funds to the District.

The Intergovernmental Agreement that would be approved by the attached resolution outlines the project, scope of work, schedule, compensation, and terms and conditions. As proposed, the project will generate a total of 25.99 wetland mitigation credits. None of the wetland impacts being mitigated occurred on District property. The District is not able to sell any of the credits generated by this project. As mitigated wetland, the project area will be subject to a deed restriction or restrictive covenant restricting future development, which will not be a significant change in the level of encumbrance on the property given its existing dedication as an Illinois Nature Preserve.

REVIEW BY OTHERS: Director of Finance, Chief Operations Officer, Manager of Board Operations, and Corporate Counsel.

STATE OF ILLINOIS)
) SS
COUNTY OF LAKE)

BOARD OF COMMISSIONERS
LAKE COUNTY FOREST PRESERVE DISTRICT
REGULAR DECEMBER MEETING
DECEMBER 13, 2023

MISTER PRESIDENT AND MEMBERS OF THE BOARD OF COMMISSIONERS:

Your **PLANNING COMMITTEE** presents herewith "A Resolution Approving an Intergovernmental Agreement with the Lake County Stormwater Management Commission for the Grainger Woods Hydrologic Restoration Project," and requests its approval.

PLANNING COMMITTEE:

Date: 12-4-2023 ☐ Roll Call Vote: Ayes: ___ Nays: _____

☒ Voice Vote Majority Ayes; Nays: 0

LAKE COUNTY FOREST PRESERVE DISTRICT
LAKE COUNTY, ILLINOIS

A RESOLUTION APPROVING AN INTERGOVERNMENTAL AGREEMENT WITH THE LAKE COUNTY STORMWATER MANAGEMENT COMMISSION FOR THE GRAINGER WOODS HYDROLOGIC RESTORATION PROJECT

WHEREAS, under Article 7, Section 10 of the Constitution of the State of Illinois, units of local government, such as the Lake County Stormwater Management Commission (the "SMC") and the Lake County Forest Preserve District (the "District") are authorized to contract or otherwise associate among themselves, to obtain or share services and to exercise, combine, or transfer any power or function, in any manner not prohibited by law; and

WHEREAS, under the Intergovernmental Cooperation Act, 5 ILCS 220/1 et seq., public agencies, such as the SMC and the District, may enter into intergovernmental agreements to exercise, combine, transfer, and enjoy jointly their power or powers, privileges, functions, or authority, in any manner not prohibited by law; and

WHEREAS, the SMC and the District jointly desire to improve water quality, restore District lands, and enhance natural drainage; and

WHEREAS, it is in the best interests of the District to enter into an intergovernmental agreement with SMC, in substantially the form attached hereto, (the "Intergovernmental Agreement") under which (i) the District would restore wetlands and adjacent upland buffer areas within an approximately 52-acre project area encompassing a portion of Grainger Woods (34.2 acres) and the adjacent George M. Covington Conservation Easement parcels (18.1 acres) and (ii) the restoration project would be paid for through a combination of fees-in-lieu paid to SMC for wetland impacts within the Des Plaines River watershed, District funds, and District in-kind contributions ; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Lake County Forest Preserve District, Lake County, Illinois **THAT**:

Section 1. Recitals. The recitals set forth above are incorporated as a part of this Resolution by this reference.

Section 2. Approval of Intergovernmental Agreement. The Intergovernmental Agreement is hereby approved in substantially the form attached hereto.

Section 3: Execution of Agreement. The President and Secretary of the District are authorized to execute and attest to the Intergovernmental Agreement in substantially the form attached hereto.

Section 4. **Effective Date.** This Resolution shall be in full force and effect from and after its passage and approval in the manner provided by law.

PASSED this _____ day of _____, 2023

AYES:

NAYS:

APPROVED this _____ day of _____, 2023

_____
Angelo D. Kyle, President
Lake County Forest Preserve District

ATTEST:

_____
Julie Gragnani, Secretary
Lake County Forest Preserve District

Exhibit No. _____

INTERGOVERNMENTAL AGREEMENT
between the
LAKE COUNTY STORMWATER MANAGEMENT COMMISSION
and the
LAKE COUNTY FOREST PRESERVE DISTRICT
for
WETLAND RESTORATION FUND IMPLEMENTATION FOR
GRAINGER WOODS HYDROLOGIC RESTORATION PROJECT

THIS AGREEMENT, effective this _____ day of _____, 2023, is by and between the LAKE COUNTY STORMWATER MANAGEMENT COMMISSION, 500 W. Winchester Road, Suite 201, Libertyville, Illinois 60048 (hereinafter called "SMC") and the LAKE COUNTY FOREST PRESERVE DISTRICT, 1899 W. Winchester Road, Libertyville, Illinois 60048 (hereinafter called "LCFPD").

I. PROJECT DESCRIPTION

SMC maintains and controls a "Wetland Restoration Fund," into which SMC deposits fees ("Fees-in-Lieu") paid by parties whose construction activities impact wetlands and waters that are subject to SMC's jurisdiction ("Developers"). From time to time, SMC enters into an agreement with a party, such as this Agreement, under which (i) the party agrees to complete a wetland creation, restoration, or enhancement project, the benefits of which will result in "mitigation credits" that mitigate the impacts caused by Developers who have paid Fees-in-Lieu and (ii) SMC uses Fees-in-Lieu deposited within the Wetland Restoration Fund to reimburse the party for such work. SMC and the District enter into this Agreement with the intent of (i) LCFPD causing the Grainger Woods Hydrologic Restoration Project to be performed, (ii) such project resulting in the mitigation of a minimum of 3.95 acres of mitigation credits, and (iii) SMC reimbursing LCFPD for certain costs of such project.

The Grainger Woods Hydrologic Restoration Project (hereinafter referred to as "Project") involves the restoration of an approximately 52.3-acre section of the approximately 329-acre Grainger Woods Conservation Preserve located south of Illinois Route 60 and east of St. Mary's Road in Mettawa, Lake County, Illinois. The "Project Area" includes land owned by two entities. The western parcels of the Project Area adjacent to St. Mary's Road totaling 18.1-acres are owned by Mr. George M. Covington, as trustee under a trust agreement dated September 15, 1959 (PIN #s 1502300006 & 1502300007) and are generally depicted on ATTACHMENT A collectively as "Forest Preserve Easement. " However, pursuant to the "Grant of Conservation Right and Easement," dated May 8, 2013, and recorded in the Office of the Lake County Recorder as Document No. 6993598 (the "Conservation Easement Grant"), Mr. Covington has granted a conservation right and easement to LCFPD within the Easement Parcels to allow LCFPD to manage the Easement Parcels, as stated in the Conservation Easement Grant (the "Conservation Easement"). The eastern, internal parcel of the Project Area, totaling 34.2 acres and generally depicted on ATTACHMENT A as the "Forest Preserve Property" within the "Proposed Project Area," is wholly owned and managed by LCFPD (PIN #1502100022).

The western portion of the Project Area currently consists of a mixture of oak woodland and northern flatwoods habitats. Wetland communities in this area have reduced physical function due to hydrologic modifications, especially from the drain tiles in this area (approximately 6,954 linear feet of drain tiles have been identified within the Project Area). The eastern portion of the Project Area is primarily characterized by 'old field' vegetation (i.e., a mix of native and non-native species often found in land formerly used for agricultural purposes). The LCFPD plans to promote northern flatwoods

development/succession on the western portion of the Project Area and northern flatwoods/sedge meadow establishment on the eastern portion of the Project Area.

II. SCOPE OF WORK

The "Project" includes the work generally depicted on plans entitled "Lake County Forest Preserve District, Grainger Woods Hydrologic Restoration Project," prepared by Hey and Associates, Inc., dated April 14, 2023, and consisting of 11 sheets (the "Work Plans"), and includes (i) the disablement of drain tiles to restore historic wetlands (i.e., drained hydric soils), (ii) creation of a wetland area by grading a shallow swale to connect restored wetlands, (iii) enhancement of two existing wetlands primarily through vegetative management techniques, (iv) enhancement of upland buffer areas surrounding the wetlands, and (v) satisfy and meet the Mitigation Goals and Performance Standards (defined in Section V.2).

The Project is expected to generate a total of 25.99 acres of "mitigation credit" through 23.07 acres of wetland restoration (100% credit/ac. within the Project Area interior and 75% credit/ac. within the perimeter buffer), 0.61 acre of wetland creation (100% credit/ac. within the Project Area interior and 75% credit/ac. within the perimeter buffer), 20.06 acres of existing wetland enhancement (25% credit/ac.) and 3.81 acres of upland buffer enhancement. The Mitigation Credits Overall Plan (Drawing No. C2.0) by Hey & Associates, Inc. illustrates the intended credits and is included as ATTACHMENT B of this AGREEMENT. LCFPD will not have any right to sell, convey, or otherwise use the mitigation credits, which are intended to offset impacts to isolated waters of Lake County that have already occurred or been authorized by SMC.

III. PROJECT SCHEDULE

LCFPD shall use good faith efforts to cause the Project work to proceed according to the PROJECT SCHEDULE included as ATTACHMENT C. The parties shall work cooperatively and in good faith to extend or otherwise adjust the dates in the PROJECT SCHEDULE to address any issues that arise and have a significant impact on the PROJECT SCHEDULE.

IV. COMPENSATION

The PROJECT BUDGET is included as ATTACHMENT D of this AGREEMENT. SMC shall reimburse LCFPD for Project costs incurred by LCFPD, subject to the following:

1. The total amount reimbursable by SMC through the SMC Wetland Restoration Fund (WRF) shall not exceed $354,695.00 for costs incurred during the completion of the Project in accordance with the WRF Implementation Guidance Document (Revision #2, dated August 4, 2022) for tasks associated with the Work Plans (the "Guidance Document") and incurred prior to SMC "Mitigation Sign-off" (as stated in the PROJECT SCHEDULE). SMC is not obligated to reimburse LCFPD for any costs in excess of $354,695.00.

2. The LCFPD shall provide documentation of costs incurred for which LCFPD is seeking reimbursement.

3. The LCFPD may periodically submit to the SMC invoices for reimbursement to the LCFPD of reimbursable costs. Payment of reimbursable costs identified in an invoice shall be due and payable by the SMC within 60 days after its receipt of the LCFPD's invoice and cost documentation for the work described in such invoice and SMC's determination that the work described in such invoice has been satisfactorily completed.

4. SMC shall retain 10% from each payment, up to a total retained amount of 10% g($35,469.50) of the total funding committed by this AGREEMENT until the LCFPD has successfully completed the Project. Final payment of reimbursable costs by the SMC shall occur when the SMC agrees that the Project meets the Mitigation Goals and Performance Standards (defined in Section V.2) and the provisions of the Guidance Document.

V. TERMS AND CONDITIONS

1. Permit Requirements - The project shall be in full compliance with SMC's Permit #WDP-23-605 dated August 1, 2023, and the U.S. Army Corps of Engineers' (USACE) permit #LRC-2022-610 dated June 15, 2023. SMC's authorization and financial support for the Project is conditioned on LCFPD performing the Project in compliance with all applicable federal, state, and local statutes and regulations.

2. Mitigation Goals and Performance Standards - The Project will (i) satisfy the performance standard requirements as defined in Appendix N of SMC's Watershed Development Ordinance ("WDO", dated July 11, 2023), (ii) satisfy the project-specific standards outlined in the Project Mitigation Document attached as ATTACHMENT E and the Monitoring and Management Plan attached as ATTACHMENT F, and (iii) meet the provisions of the Guidance Document (collectively, the "Mitigation Goals and Performance Standards").

3. Project Completion - The LCFPD's responsibility for the mitigation wetlands and buffers in the Project Area shall be released in writing by the SMC as follows: After the minimum 5-year performance period required by the WDO, the LCFPD shall provide written notification to the SMC along with the following information: 1) a scaled plan (min. 1 in. = 100 ft.) showing the delineated wetland boundaries and actual acreages of the mitigation wetlands and wetland buffers, and 2) a summary of how the Performance Standards have been met for each wetland and buffer. Upon notification, the SMC shall review the submitted information and perform a site inspection to evaluate whether the Mitigation Goals and Performance Standards have been satisfied. If the Mitigation Goals and Performance Standards have been met, the SMC shall notify the LCFPD in writing that LCFPD is released from its responsibility for the mitigation site . If the SMC determines that the Mitigation Goals and Performance Standards have not been met based on the information submitted and site inspection, the SMC shall notify the LCFPD in writing of the specific shortfalls. The LCFPD shall be granted a specified, reasonable time limit to respond to the identified shortfalls. Failure to fully respond to the identified shortfalls within the specified time limit may result in SMC's use of the 10% retainer to correct the shortfalls. Upon correction of the shortfalls, SMC shall notify the LCFPD in writing that LCFPD is released from its responsibility for the mitigation site.

4. Contractor Review - LCFPD intends to enter into contracts with third parties under which such third parties will perform all or portions of the Project. If, under the Downstate Forest Preserve District Act (70 ILCS 805/0.001 et seq.), the District must award such a contract to the lowest responsible bidder, the District shall (i) solicit bids for the contract from contractors; (ii) require the contractors, in conjunction with their bids, to identify each of its subcontractors; and (iii) upon receipt of such bids, provide SMC with the names of each bidding contractor and its proposed subcontractors. SMC may provide comments concerning such contractors and subcontractors to LCFPD.

5. Pre-Construction Meeting and Inspections - The SMC shall participate in the pre-construction meeting and will conduct field inspections of the Project Area prior to construction, following construction and during Project work in conjunction with the following milestones: completion of grading, during planting, vegetation establishment, and annual site visits during the growing season.

6. Applicable Law - This Agreement shall be governed by and construed according to the laws of the State of Illinois.

7. Merger - This Agreement supersedes any and all other Agreements, oral or written, between the parties hereto with respect to the subject matter hereof.

8. Amendments - All amendments, modifications, adjustments, additions, and/or deletions to this Agreement are valid only if approved in writing by the authorized representatives of both parties.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed, as evidenced by the signatures of their duly authorized representative as affixed below.

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION:

Kurt Woolford, Executive Director

Date

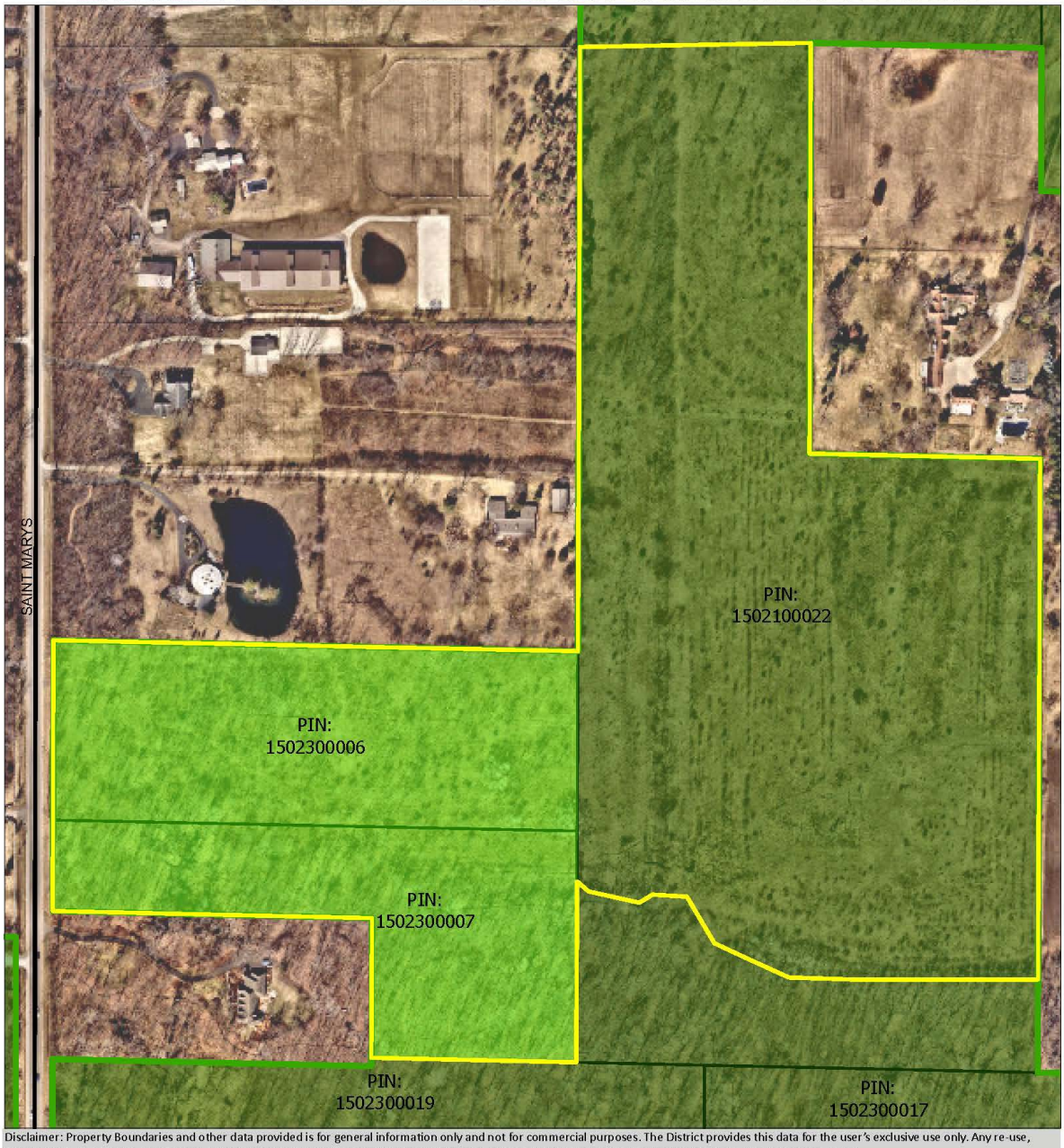
LAKE COUNTY FOREST PRESERVE DISTRICT:

Alex Ty Kovach, Executive Director

Date

ATTACHMENT A – PARCEL MAP

SMC WETLAND RESTORATION FUND - RFP 2022
PROPOSED PROJECT AREA - GRAINGER WOODS CONSERVATION PRESERVE



Disclaimer: Property Boundaries and other data provided is for general information only and not for commercial purposes. The District provides this data for the user's exclusive use only. Any re-use, transmission, duplication, or distribution without the permission of the District is prohibited. Map sources include: Lake County GIS Division | Basemap: 2022 Aerial

Lake County Forest Preserves

Map Created on 7/13/2023

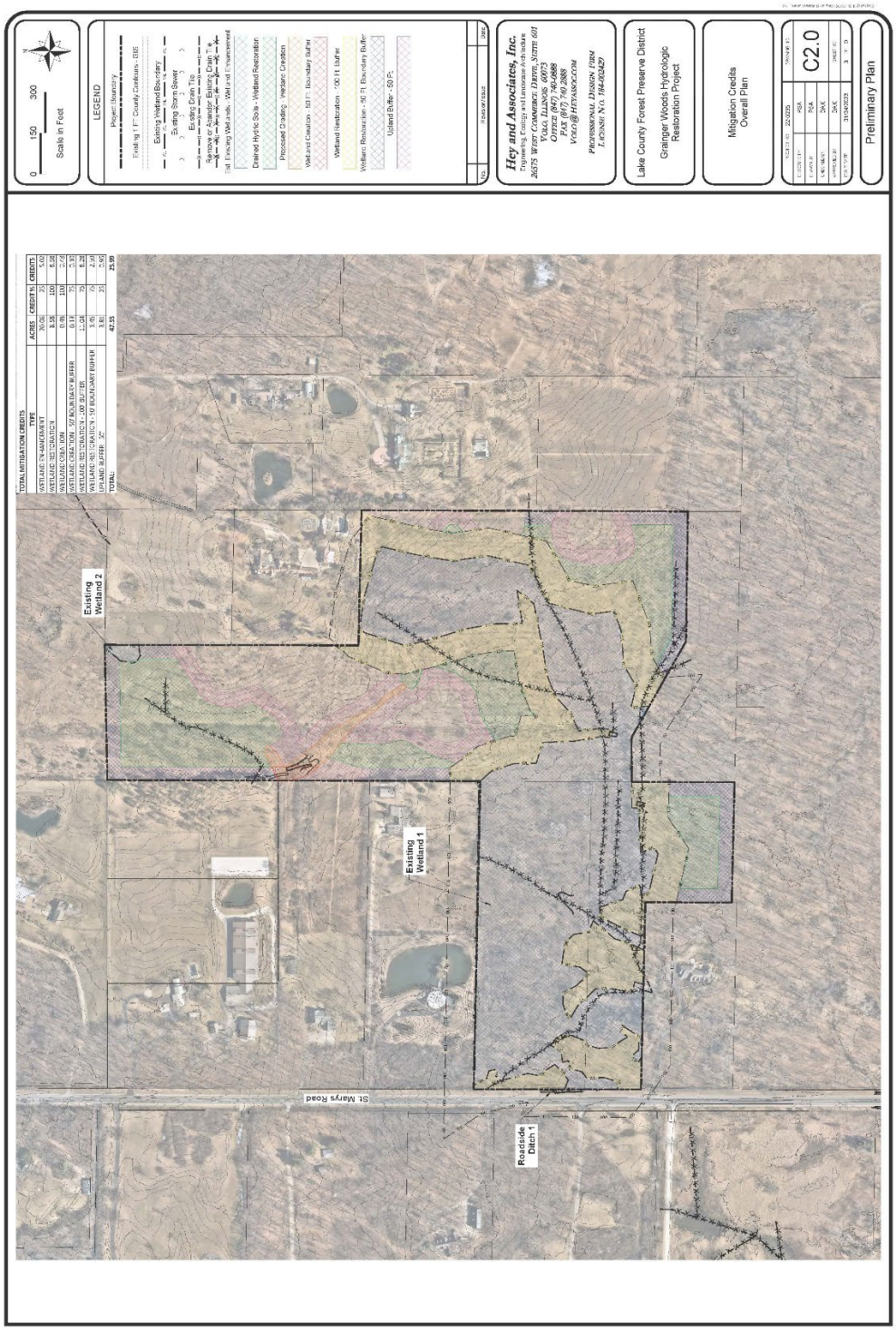
0 150 300
Feet

N

LEGEND

- RoadCenterline
- Proposed Project Area
- Forest Preserve Boundaries
- Forest Preserve Property
- Forest Preserve Easement
- County Parcel Data

ATTACHMENT B – MITIGATION CREDITS OVERALL PLAN



ATTACHMENT C - PROJECT SCHEDULE

Task	Proposed Schedule
Project Administration	October 2023 - 2030
Final Design	October 2023
Permitting	In Progress, anticipate approvals October 2023
Construction	October 2023 - December 2023
Tile Disablement	October 2023 - December 2023
Berm Construction	October 2023 - November 2023
Construction Oversight; DECI Inspections	October 2023 - December 2023
Operations and Maintenance	January 2024 - September 2024
Bidding Seed Purchase; Phase 1	March 2024
Bidding Seed Purchase; Phase 2+	March 2025*
Bidding Invasive Species Control; Phase 1	August 2024
Bidding Invasive Species Control; Phase 2+	August 2025*
Bidding Plant Plug Purchase/In-house Grow	October 2024
Bidding Native Shrub Purchase; Phase 1	January 2025
Bidding Native Shrub Purchase; Phase 2	January 2026*
Plant Plug Installation	June 2025
Native Seed Installation; Phase 1 (In-house)	November 2024 - January 2025
Native Seed Installation; Phase 2+ (In-house)	November 2025 - January 2026*
Native Shrub Installation; Phase 1 (In-house)	September 2025
Native Shrub Installation; Phase 2 (In-house)	September 2026*
Performance Monitoring	June 2025 - September 2030
Mitigation Sign-off**	October 2030

** subsequent phases will be determined by LCFPD Project Manager and will be performed on an 'as needed' basis*

*** sign off may require final wetland delineation and report creation/submittal*

ATTACHMENT D – PROJECT BUDGET

SMC WETLAND RESTORATION FUND - REQUEST FOR PROPOSALS 2022
APPLICANT: LAKE COUNTY FOREST PRESERVE DISTRICT
PROJECT NAME: GRAINGER WOODS - CENTER FLATWOODS HYDROLOGIC RESTORATION
PROJECT SITE: GRAINGER WOODS CONSERVATION PRESERVE AND ADJACENT EASEMENT PARCELS

PROPOSED PROJECT BUDGET **Last modified:** **3/8/2022**

Item Description	# of Units	Units	Est. Unit Cost	Est. Total Cost	WRF Funding Requested	Local Match	Type of Match	Match Source	NOTE:
Administrative									
Project Management	200	Hours	$ 70.00	$ 14,000.00		$ 14,000.00	IN-KIND	Matt Ueltzen time	
Hydrologic Restoration Oversight	24	Hours	$ 70.00	$ 1,680.00		$ 1,680.00	IN-KIND	Kevin Kleinjan time	
Crew Supervision	48	Hours	$ 70.00	$ 3,360.00		$ 3,360.00	IN-KIND	F. Volm/D. Cassin time	
Planning and Engineering									
Drain Tile Investigation/Mapping	1	Lump Sum	$ 12,790.00	$ 12,790.00		$ 12,790.00	CASH	Farm Mangement	
Detialed Soil Survey	1	Lump Sum	$ 10,000.00	$ 10,000.00		$ 10,000.00	CASH	Farm Mangement	
Engineering/Design Plan Development	1	Lump Sum	$ 61,070.00	$ 61,070.00		$ 61,070.00	CASH	SDPR CIP	
Final Plan, Delineation, Permitting	1	Lump Sum	$ 30,000.00	$ 30,000.00	$ 25,650.00	$ 4,350.00	CASH	Farm Mgmt./Donation	Contract
Construction									
Drain Tile Disablement	120	Hours	$ 75.00	$ 9,000.00		$ 9,000.00	IN-KIND	Labor - HEC	
Hydrologic Modifications (Solid Pipe Installation, Swale Construction, etc.)	300	Hours	$ 75.00	$ 22,500.00		$ 22,500.00	IN-KIND	Labor - HEC	
Hydrologic Modificaion & SE/SC Materials	1	Lump Sum	$ 27,050.00	$ 27,050.00	$ 27,050.00				Material Purchase
Rubber Track Carrier Rental	2	Weeks	$ 4,000.00	$ 8,000.00		$ 8,000.00	CASH	Farm Mgmt./Donation	
Planting									
Plant Materials	1	Lump Sum	$ 116,500.00	$ 116,500.00	$ 116,500.00				Material Purchase
Temp/Permanent Seed Installation	130	Hours	$ 58.00	$ 7,540.00		$ 7,540.00	IN-KIND	Labor - NRC	
Plant Plug Installation	25000	Each	$ 1.25	$ 31,250.00	$ 31,250.00				Contract
Native Shrub Installation	225	Hours	$ 58.00	$ 13,050.00		$ 13,050.00	IN-KIND	Labor - NRC	
Management and Monitoring									
Invasive Species Control	5	Year	$ 10,000.00	$ 50,000.00	$ 50,000.00				Contract
Woody Invasive Species Clearing/Follow-up	2000	Hours	$ 36.00	$ 72,000.00	$ 72,000.00				Contract
Land Value									
Estimated Land Value	52.3	Acre	$ 4,000.00	$ 209,200.00		$ 209,200.00	CASH		
SUBTOTALS:				**$ 698,990.00**	**$ 322,450.00**	**$ 376,540.00**			
Contingency									
10% Contingency (WRF Funds Only)				$ 32,245.00	$ 32,245.00	NA			
TOTALS:				**$ 731,235.00**	**$ 354,695.00**	**$ 376,540.00**			

51.5% LOCAL MATCH PERCENTAGE

ATTACHMENT E – PROJECT MITIGATION DOCUMENT

Lake County Forest Preserves

PROJECT MITIGATION DOCUMENT
FOR
GRAINGER WOODS CONSERVATION PRESERVE

Grainger Woods Hydrologic Restoration Project
Mettawa, Lake County, Illinois
#WDP-23-605

Off-Site Mitigation in Response to
Wetland Restoration Fund Request for Proposals 2022

Prepared By:
Lake County Forest Preserve District
1899 W. Winchester Road
Libertyville, Illinois 60048

October 23, 2023

Table of Contents

1. INTRODUCTION

The Grainger Woods Conservation Preserve ("Grainger Woods") near Mettawa, Illinois, contains a mix of high-quality natural communities, marginal communities impacted by past agricultural practices, and an equestrian area. Encompassing 329 acres, Grainger Woods contains a mosaic of oak woodlands, northern flatwoods, sedge meadow/marsh, and prairie habitats. The Lake County Forest Preserve District ("LCFPD" or "District") began habitat restoration work at this site almost immediately after large acquisitions occurred to create this preserve in the late 1990s; however, restoration efforts have been intermittent and incremental since that time. The site harbors many important areas of remnant vegetation, including several State Endangered and Threatened species, but also contains many opportunity areas for increasing habitat value and ecological function. Grainger Woods and the surrounding lands were identified by the Chicago Metropolitan Agency for Planning and the Chicago Wilderness Green Infrastructure Vision as regional conservation priorities. Additionally, the Lake County Green Infrastructure Model and Strategy identifies Grainger Woods as both a Strategic Habitat Conservation Area and a priority Ecological Complex because of the site's ability to provide landscape scale conservation benefits (reduce habitat fragmentation, mitigate climate variability, watershed protection, and hubs and corridors for plant and animal species to migrate, reproduce and survive). The District's overall goal for the restoration of Grainger Woods is: *To enhance the diverse biological resources of Grainger Woods Conservation Preserve individually and connectively as a woodland system along the southern Des Plaines River corridor in Lake County. Major initiatives will focus on stabilizing the woodland structure, restoring age/size class distribution of native trees, restoring historic drainage patterns, replacing invasive species with native forbs, grasses, shrubs and trees, re-introducing native wildlife and establishing long-term monitoring and management schedules*.

1.1 Mitigation Goals

The Lake County Stormwater Management Commission's Wetland Restoration Fund Request For Proposals (Issued February 10, 2022) is seeking to achieve a mitigation acreage of 3.95 acres, at a minimum, in the Des Plaines River Watershed. LCFPD plans have been designed to achieve and exceed this minimum acreage. As proposed, this project will generate 25.99 acres of wetland mitigation credit, derived from:

0.48 acres wetland creation x 100% credit/acre = 0.48 acres credit
8.58 acres wetland restoration x 100% credit/acre = 8.58 acres credit
0.13 acres wetland creation (50' boundary buffer) x 75% credit/acre = 0.10 acres credit
11.04 acres wetland restoration (100' buffer) x 75% credit/acre = 8.28 acres credit
3.45 acres wetland restoration (50' boundary buffer) x 75% credit/acre = 2.59 acres credit
20.06 acres wetland enhancement x 25% credit/acre = 5.02 acres credit
3.81 acres upland buffer (50') x 25% credit/acre = 0.95 acres credit

2. MITIGATION SITE INFORMATION

2.1 Site Location

The Grainger Woods Hydrologic Restoration Project site, approximately 52.3 acres in size, is located northeast of the intersection of St. Mary's Road and Everett Road in Mettawa, Illinois. Specifically, the site is in the west-central portion of Grainger Woods Conservation Preserve and includes the adjacent George M. Covington easement parcels on St. Mary's Road. The project is entirely contained within Section 2 of Vernon Township, T43 N R11 E. See Exhibit 1 for the project location.

2.2 Physical Description

2.2.1 General Site Character/Current Condition

The western portion of the proposed mitigation project site is a mixture of oak woodland and northern flatwoods habitats that have recently undergone initial vegetation management efforts (removal of buckthorn, Rhamnus cathartica and other woody invasive species). The majority of this area was involved in agricultural production in the past, but this practice was discontinued approximately 50+ years ago, yielding a variegation of remnant and early- to mid-successional oak woodland and northern flatwood habitat interspersed with sedge meadow communities where tree cover is minimal. Wetland communities in this area have reduced physical function due to hydrologic modifications, especially from the relic drain tiles operating in this area. The eastern portion of the proposed project site was involved in agriculture much later and is primarily characterized by 'old field' vegetation; however, the District has initiated restoration efforts to these fields, primarily through tree planting projects and limited invasive species management. At present this area contains a mixture of early-successional reforestation, low quality native/Eurasian herbaceous vegetation, and wetlands with reduced biological and physical functions, i.e. dominated by invasive species (primarily reed canary grass, *Phalaris arundinacea*) and impacted hydrology from tile drainage.

2.2.2 Pre-Settlement Condition

Previous site inventories, historic aerial photos, NRCS and detailed site-specific soil mapping data, as well as the site's current conditions were evaluated to determine the pre-settlement condition of the project site. District ecologists conclude this area was likely a transitional area, between larger mesic forest, oak woodland and northern flatwoods habitats found farther west adjacent to/associated with the Des Plaines River, and the prairie/oak savanna complexes found to the east on the moraine dividing the Des Plaines River and North Branch Chicago River watersheds. In both oak woodland/northern flatwoods and prairie/savanna areas, wetlands were abundant and intermixed with upland communities. In areas such as the proposed project area, wetlands of various forms were a large part of the landscape, even dominating some areas. As mentioned previously, sadly many wetland areas have been degraded by development and past agricultural practices. Existing in this transitional zone, the proposed project site likely held elements of all community types: oak woodland/savanna and prairie in upland areas and northern flatwoods, sedge meadow/wet prairie, and marsh in depressions.

2.3 Land Use

Currently all proposed project areas are permanently deeded as conservation land for the purpose of protecting and preserving habitat for native flora and fauna in its natural condition.

2.4 Ownership

The proposed project area includes land owned by two entities. The western parcels adjacent to St. Mary's Rd are owned by Mr. George Covington; however, Mr. Covington has granted a Conservation Easement to these parcels, allowing the Lake County Forest

Preserve District to provide for their management. Additionally, Mr. Covington has dedicated the easement parcels as Illinois Nature Preserve ("George M. Covington Nature Preserve Buffer Addition to Grainger Woods Nature Preserve"); therefore, these parcels will be protected in perpetuity. The eastern, internal parcel is wholly owned and managed by the Lake County Forest Preserve District.

Parcel Table:

PIN	Owner	Project Acreage
1502300006	Mr. George M. Covington	10.0
1502300007	Mr. George M. Covington	8.1
1502100022	Lake County Forest Preserve	34.2
	TOTAL:	52.3

2.5 Significant Biological Resources

2.5.1 Flora

The District's previous and ongoing inventory and monitoring efforts have identified the presence of 230 total plant species throughout the Grainger Woods Conservation Preserve, 199 of which are native. The native FQI for this preserve is 70.53 and the mean C value is 5.00. Much of the data driving this high quality are the many remnant and previously restored areas in the southern portion of the preserve. The District does not possess area-specific vegetation data/analysis for the mitigation area, but it is assumed to be less diverse and likely would not achieve the same FQI/mean C values. Regardless, this area provides great opportunity for increasing the acreage of high-quality habitats, due to their presence at the site. Significant plant resources present at Grainger Woods include five State Endangered, eight State Threatened and 40 Lake County Rare species, including, but not limited to species such as purple-fringed orchid (*Platanthera psycodes*), awnless graceful sedge (*Carex formosa*), brome tussock sedge (*Carex bromoides*), and marsh speedwell (*Veronica scutellata*), all of which have the potential to benefit from the proposed project and the increased/enhanced habitat acreage.

2.5.2 Fauna

In total, Grainger Woods supports five amphibian, 73 bird, twelve mammal, and three reptile species, in addition to several hundred invertebrate species. Ten species observed within the preserve are identified by the Illinois Wildlife Action Plan (Illinois Dept. of Natural Resources), as "Species in Greatest Conservation Need". Species that are State or Federally listed as threatened or endangered, as well as rare or declining species and those with vulnerable habitats are some of the criteria used to identify these species. For Grainger Woods, this includes, but is not limited to blue-spotted salamander (*Ambystoma laterale*), red-headed woodpecker (*Melanerpes erythrocephalus*), American redstart (*Setophaga ruticilla*), and the ovenbird (*Seiurus aurocapilla*) all of which have the potential to benefit from the oak woodland and northern flatwoods habitats that will be increased through the proposed project.

3. MITIGATION DESIGN

3.1 Topography

Grainger Woods is located on the west facing slope of the Park Ridge Moraine. The high point in the proposed project area is located near the northeast corner and sits at nearly 689 feet above msl. The site generally slopes to the west to its low point along St. Mary's Road at roughly 653 feet above msl. Except for the noticeable topography on the eastern boundary, the majority of the site appears rather flat, without discernable slopes.

Grading to alter existing elevations is proposed in several work areas. The majority of the grading will be to establish a southerly surface flow path from the disabled tile at the north end of the project area (Appendix A, Sheet C2.3). This will direct water towards the interior of the site and reduce off-site impacts to the neighboring homes. In the southern portion of the project area, incoming drain tiles will be removed and replaced with solid pipe to allow this tile water to 'daylight' to the surface. At the outlets of these solid pipes, minor grading may be needed to ensure positive drainage. Lastly, minor grading may be necessary to ensure surface waters flow to the southern extent of the project area in order to reduce flood risks to the homesite on St. Mary's Road. Grading was planned to produce the required material needed to construct the berm in the Covington easement, also to reduce flood risk to this same homesite (Appendix A, Sheet C2.2).

3.2 Hydrology

The proposed project area is located within the Lower Des Plaines River sub-watershed of the Des Plaines River. Most of the site consists of poorly drained soils that, if not for the existing drain tiles, would be seasonally saturated with the water table at or near the soil surface. The site possesses several depressions that are characteristic of northern flatwoods communities that could support seasonal flooding to depths of up to two feet. Outside of the proposed project area, hydrology has been impacted by development (roads and nearby home sites). Within the project area, hydrology is impacted by the presence of drain tiles. Approximately 6,954 linear feet of drain tile have been identified within the proposed project site.

It is anticipated that wetlands will (re)hydrate from daylighted drain tiles and precipitation/natural surface runoff. As with many other flatwoods and sedge meadow communities in areas surrounding the project site, it is expected that wetland areas will fill with snow melt and rains in the spring and be sustained by periodic rain events throughout the summer; however, most will likely experience some dry periods mid-summer through the fall, annually.

3.3 Soils

Surface soil material will be handled separately from subsoil material during construction actions to modify site grading, per 'good' soil handling practices. Shallow grading (less than two feet maximum, mostly less than one foot) will occur, with all material being re-utilized on-site. No supplemental soil additions will be provided. While soil depth may be less than the minimum 12 inches, depth will be consistent with soils in the existing area from which they were removed. There will be no need to add or amend the planting medium.

According to the 2004 Soil Survey Lake County, Illinois (NRCS), six soil types are found within the proposed project area. However, in 2010, the District contracted with NRCS to

perform a more detailed, site-specific soil survey for Grainger Woods that involved on-the-ground soil sampling and mapping. This mapping only covered District property and did not include all of the proposed project area (e.g. Covington parcels were not included, as the Conservation Easement to the District was not created at that time). This detailed soil mapping revealed only four soil types and it is assumed that these soil types are also found within the easement parcels, see Soil Map (Exhibit 2). Listed below are the soil types identified within the project area from the 2010 soil mapping:

228 – Nappanee silt loam is a level to gently sloping, somewhat poorly drained soil occurring on broad flats east of the Des Plaines River. The most serious limitations are slow movement of water through the soil and a seasonally high water table. This is an upland soil that developed under deciduous woodland vegetation.

330 – Peotone silty clay loam is a level to depressional, very poorly drained soil found in low areas in all parts of the county. The water table is at the surface in the spring and one to four feet below the surface the rest of the year. It is subject to ponding and the most serious limitations are low position and a high water table. This is a hydric soil that developed under wet prairie, and marsh vegetation.

465 – Montgomery silty clay is a level to depressional, poorly drained to very poorly drained soil found in low parts of the landscape. The water table is at or close to the surface in the spring and one to four feet below the surface the rest of the year. The serious limitations are the clayey texture, low position, and a high water table. This is a hydric soil that developed under herbaceous wetland plants mixed with hardwood trees.

560 – St. Clair silt loam is a level to sloping, moderately well drained soil found on till plains and moraines. The water table is estimated at two to three feet below the surface. This is an upland soil that developed under deciduous woodland vegetation.

3.4 Planting Plan

Using the previous concept plan developed by Hey and Associates, Inc. and the estimated wetland boundaries provided, this site contains some extensive wetlands. However, when this concept plan is overlaid with the detailed soil mapping from 2010, wetlands were previously even more extensive at this site, as evidenced by the broad bands of hydric soils (Soil Map Unit 465), especially within the eastern portion of the proposed project. These wetlands are greatly impacted by the hydrologic disturbance caused by drain tiles.

It is the District's plan to promote northern flatwoods development/succession on the western portions of the project area and promote northern flatwoods/sedge meadow establishment to the eastern portion of the project area. All areas within the proposed project limits will receive native seed installation according to the wetness regime present at the site once restoration actions are complete and the new hydrologic regime is established. Additionally, plant plugs will be installed to depressional areas as well as within all created swales. Upland plant plugs and native shrubs will be installed in appropriate areas depending upon light/moisture requirements of each species. Detailed seed/plant lists will generally follow past practices to mimic the highly diverse, high-quality vegetation present at the site and typical of other Lake County Forest Preserve District restoration projects.

A complete set of hydrologic restoration plans is attached in Appendix A, which includes anticipated/potential species lists for project areas. Actual seed/plant species lists may

vary due to availability of species/plant material throughout the duration of the project. A map of the proposed project area is attached (Exhibit 3). This map depicts the locations of anticipated wetland enhancement, restoration, and creation.

4. DEED OR PLAT RESTICTIONS

The project areas are owned by two parties: the Lake County Forest Preserve District and Mr. George Covington. LCFPD portions are publicly owned, and the mitigation site is the intended land use for perpetuity. The portion owned by Mr. George Covington is held within a conservation easement, allowing LCFPD authority to manage this land. Furthermore, this land has been dedicated as Illinois Nature Preserve Buffer. The mitigation project is consistent with the intended LCFPD and INPC land use for perpetuity; therefore, no further deed or plat restrictions will be placed over the site.

5. CONSTRUCTION SCHEDULE

The anticipated project schedule is provided as Exhibit 4. Construction is anticipated to begin in the fall of 2023 with the berm construction and tile disablement. Mowing for access routes will be necessary prior to the start of work in some area but will be kept to a minimum to reduce potential impacts to wildlife. All mowing/construction will be conducted after the growing season, to reduce impacts to existing wildlife and vegetation. It is anticipated that all work will be conducted when the soil is dry to reduce soil compaction and potential rutting. All construction areas with disturbed soil will receive temporary seeding as soon as work is complete.

Permanent native seed mixes and wetland plant plug installation will occur in 2024 and 2025 as schedules and bidding allow. Over-seeding (enhancement) will occur throughout the project areas during the performance period, as needed, to meet performance standards.

Vegetation management (control of non-native and invasive species) will occur throughout the performance period, as needed, to meet performance standards.

6. FINANCIAL ASSURANCE

Since the project will be performed by a public agency (LCFPD), a financial surety is not being provided. Construction and monitoring-management during the 5-year performance period will be conducted by the LCFPD and will be funded by reimbursement from SMC per the executed Intergovernmental Agreement (IGA).

7. AS-BUILT PLANS

An as-built topographic plan will be provided to SMC's regulatory division for approval prior to proceeding with planting operations. The as-builts will include survey spot elevations and post-construction elevation contours overlain on the design grading plan for comparative purposes.

Upon the completion of planting activities, documentation will be provided to SMC's regulatory division of the species actually planted in the mitigation wetlands and wetland buffers, including the common and scientific name of each species, the quantity of each species planted (e.g., weight of seeds/acre, number of plugged plants/acre), the source of the seeds/plants, the planting method(s) used, and the date(s) seeding or planting occurred.

8. PERFORMANCE STANDARDS

Performance standards are predetermined goals for guiding and measuring mitigation success. Project standards reflect requirements defined in Appendix N of SMC's Watershed Development Ordinance dated July 11, 2023, with modifications for HQAR performance standard areas. This PMD defines standards for the following mitigation communities: Enhanced Wetland 1 (non-HQAR), Enhanced Wetland 1 (HQAR), Created/Restored Wetland – West, Created/Restored Wetland - East, and Enhanced Buffer.

8.1 Performance Period

The performance period will consist of a minimum of five (5) years following the completion of planting, unless the vegetation performance standards listed in Sections 8.2.1, 8.2.2, 8.2.3 and 8.2.4 have been met earlier for two (2) consecutive growing seasons, at which time the performance period may be considered complete. Conversely, the performance period may be required to be longer than five (5) years in order to meet performance standards, if they haven't been met after the standard five (5) year time frame. Performance summary data sheets are provided in Appendix A.

8.2 Performance Standards

8.2.1 Wetland Communities

The following performance standards apply to Enhanced Wetland 1 (non-HQAR), Created/Restored Wetland – West, and Created/Restored Wetland - East.

1. Floristic Quality: Each wetland community shall achieve a native mean C value of greater than or equal to 3.5 and a native FQI of greater than or equal to 20, as determined using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version).
2. Mean Wetness Coefficient: Each wetland community shall achieve a mean wetness coefficient of less than or equal to 0. Wetness coefficients are listed below, based on the category of each plant species designated in the National Wetland Plant List - Midwest Regional Plant List (U.S. Army Corps of Engineers, most recent version). The mean W for each wetland community is calculated by the following equation: Sum of wetness coefficients for all species/number of species.

   Wetness Coefficients:

National Wetland Category	Wetness Coefficient
Obligate (OBL)	-2
Facultative Wetland (FACW)	-1
Facultative (FAC)	0
Facultative Upland (FACU)	1
Upland (UPL)	2

3. Vegetative Cover: No area greater than 10 square feet within the created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
4. Invasive Species Dominance: None of the three dominant species within the mitigation communities shall be non-native or weedy species, including but not limited to, the following species: *Typha spp.*, *Phragmites australis*, *Poa compressa*, *Poa pratensis*, *Lythrum salicaria*, *Salix interior*, *Echinochloa crus-galli*, or *Phalaris arundinacea*. Dominance shall be based on the relative importance value (RIV) of each species, which is calculated by the following equation: RIVs = [RFs + RCs] / 2 x 100, where:

   RIVs is the relative importance value of the individual species in the community, RFs is the frequency of the individual species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and RCs is the coverage of the individual species occurring in all quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

8.2.2 Enhanced Wetland 2

The area of Enhanced Wetland 2 (shown in Exhibit 3) shall achieve the following standards (as determined by a meander survey during the final wetland delineation, not based on plot data or semi-annual floristic inventories):

1. Floristic Quality: Project areas must maintain or improve upon the current native mean C value of 3.19 and maintain or improve upon the existing native FQI of 14.62.
2. Wetness Coefficient (vegetation): Vegetation within project areas shall maintain or improve upon (i.e., decrease) the mean wetness coefficient value of -0.90.
3. Vegetative Cover: No area greater than 10 square feet within the created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
4. Invasive Species Dominance: None of the three dominant species within the mitigation communities shall be non-native or weedy species.

8.2.3 HQAR Areas of Wetland 1

In addition to the performance standards in Section 8.2.1, the pre-project HQAR area of Wetland 1 (shown in Exhibit 3) shall also achieve the following standards:

1. Floristic Quality: Project areas must maintain or improve upon the current native mean C value of 4.37 and maintain or improve upon the existing native FQI of 53.71.
2. Wetness Coefficient (vegetation): Vegetation within project areas shall maintain or improve upon (i.e., decrease) the mean wetness coefficient value of -0.52.

3. Non-native woody species shall have less than 10 percent cover.
4. Project areas shall achieve the following additional performance lift related to the stability of the plant-pollinator community:
    a. Native pollinator species richness ≥ 20,
    b. Interaction evenness ≥ 0.6 (on a scale of 0-1), and
    c. Nestedness (weighted NODF) ≥ 15 (on a scale of 0-100).

8.2.4 Upland/Buffer Community

The following performance standards apply to the collective area of enhanced buffer associated with the mitigation site.

1. Floristic Quality: Project areas must achieve a native mean C value of greater than or equal to 2.5 and a native FQI of greater than or equal to 15, using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version).
2. Vegetative Cover: No area greater than 10 square feet within created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
3. Invasive Species Dominance: None of the three dominant plant species in the mesic prairie buffer community shall be non-native or weedy species, including, but not limited to, the following species: *Cirsium arvense, Melilotus spp., Alliaria petiolata, Poa compressa, Poa pratensis, Ambrosia artemisiifolia*, or *Rhamnus cathartica* and *R. frangula*. Dominance shall be based on the relative importance value (RIV) of each species, which is calculated using the equation above (8.2.1.4).

9. MONITORING AND MAINTENANCE

This section documents the proposed required monitoring plan for the proposed wetland restoration project and vegetation management actions during establishment. Monitoring focuses on assessment of vegetation and site hydrology conditions and reporting protocols. Monitoring of the mitigation site will be performed by, or under the direction of, Lake County Forest Preserve Ecology Staff.

9.1 Vegetation Monitoring

Vegetation data (except for Enhanced Wetland 2) will be collected using quadrat sampling and meander search methods. Sampling will be conducted twice during each growing season (e.g., May/June and August/September).

In lieu of vegetation sampling transects, the Lake County Forest Preserve proposes an alternate quantitative sampling method that aligns with the plant-pollinator community sampling data collection protocols. Quadrat sampling will occur at previously established LCFPD monitoring plots (permanent vegetation monitoring locations), as depicted on the attached map (Exhibit 3). Sampling will focus on the HQAR Wetland 1, non-HQAR Wetland 1, and the two created/restored wetland areas (i.e., Created/Restored Wetland – West and Created/Restored Wetland – East). Each plot will be monumented with a metal stake. Four 1.0-square meter quadrats will be sampled at each plot. In addition to taking

photographs at selective plots (i.e., Wetland 1 Enhancement HQAR: GWCP-NP-027, GWCP-NP-028, GWCP-NP-029, and GWCP-NP-032; East – Wetland Restoration/ Creation/Buffer: GWCP-NP-021, GWCP-NP-033, GWCP-NP-036, and GW-NP-037; West – Wetland Restoration/Creation/Buffer: GWCP-NP-052 and GWCP-NP-053; Wetland 1 Enhancement non-HQAR: GWCP-NP-034 and GWCP-NP-051., as noted in Exhibit 3), the following data will be recorded at each plot and summarized with corresponding data for the applicable wetland mitigation community (where a quadrat is split by a mitigation community, data will consistently be applied to only one mitigation type):

1. The number and estimated percent areal coverage of each vascular plant species, including all non-native (adventive) taxa and native taxa. This data will be used to perform the calculations in items below.
2. The native mean C value, native FQI, and mean wetness coefficient will be calculated for each quadrat,
3. The native mean C value, native FQI, and mean wetness coefficient will be calculated for each plot,
4. The RIVn of total native species will be calculated by the following equation: RIVn = [RFn + RCn] / 2 x 100, where:

   RIVn is the relative importance value of the total native species in the zone,

   RFn is the total frequency of the native species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and

   RCn is the total coverage of the native species occurring in all quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

For comparative purposes, meander searches will be performed through the individual wetland mitigation communities (i.e., HQAR Wetland 1, Non-HQAR Wetland 1 Enhancement, Creation/Restoration – West, Creation/Restoration – East), and the buffer zone, and all observed plant species in each will be recorded per location. The native mean C value, native FQI and mean wetness coefficient (wetland zones) calculated from the meander search data will be compared to the transect (quadrat) data for the relevant mitigation communities.

For Enhanced Wetland 2, a meander survey will be performed during the final wetland delineation. The results will be compared with the pre-project values.

9.2 Hydrology Monitoring

At least three (3) hydrology monitoring locations will be established in the created/restored wetland mitigation communities to assess the hydrologic conditions over time. The sample points will be monumented in the field with metal stakes. The proposed location of each sample point is shown on Exhibit 3. Exact locations will be determined in the field, located via GIS and shown on As-Built.

At a minimum, hydrology monitoring will be conducted on a monthly basis during the growing season months (approx. May-October) during the compliance period. The following hydrology data will be collected at each sample point, at a minimum:

1. Depth of inundation (in. or cm.), and
2. Soil moisture condition to a minimum depth of 18 in. (e.g., saturated, moist, dry).

The hydrology data will be recorded and presented in a summary table in the annual reports.

9.3 Photo Monitoring

During the initial monitoring session, a minimum of four (4) photo monitoring (PMP) stations will be established at strategic locations within the mitigation site. The purpose of these stations will be to take photographs showing the same views and track progress of the wetland and buffer community conditions over time. Each station will be landmarked with a metal stake and the location recorded via GPS and added to the As-built survey. Anticipated locations of PMP stations are shown on Exhibit 3; however, locations may be adjusted at the time of installation based on site conditions following construction. Photos will be taken semi-annually at the same time as the vegetation monitoring visits.

9.4 Management

Table 1 lists the tentative schedule of management activities for the project area.

Table 1. Tentative Schedule of Management Activities to Meet Performance Standards

Task	2024											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Herbicide Treatment					X	X	X	X	X	X		
Mechanical Treatment							X	X				
Prescribed Burning										X	X	X
Task	Annually 2025-Mitigation Sign-off (2030)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Herbicide Treatment					X	X	X	X	X	X		
Mechanical Treatment						X	X	X	X			
Prescribed Burning			X	X						X	X	X

Prescribed burning is the preferred management method to suppress weed species and encourage the establishment of the desired native vegetation. Therefore, burning will be utilized if the fuel load is sufficient and a perceived benefit is evident. Appropriate burn permits would be obtained from IEPA and with proper notification to the local Fire Department(s) and other mandatory contacts (per LCFPD procedures) prior to the commencement of burn operations.

Weed control by mechanical (outside of wetland areas) or chemical methods will be employed, as needed, in addition to prescribed burning (or alternatively if burning is not possible).

Mechanical treatments (i.e., mowing, etc.) may be conducted throughout the growing season outside of wetland areas to help suppress the development of short-lived, invasive species such as biennial thistles (*Cirsium* spp. and *Carduus* spp.), sweet clovers (*Melilotus* spp.), and ragweeds (*Ambrosia* spp). Mowing should be performed at no less than 6 inches from the ground and under suitable field conditions to limit soil disturbance/compaction. Care will be taken to avoid disturbance to ground-nesting songbirds during nesting season in late spring and early summer. Hand mowing or weed whipping techniques will be used within the wetland boundaries.

Chemical treatments will be made with appropriate herbicides including but not limited to, herbicides with the following active ingredients: glyphosate, triclopyr, clethodim, aminopyralid. Applications will be used to control exotic, invasive, and weedy species

associated with emergent wetland and upland plant communities. Target species within the wetlands will include, but are not limited to, purple loosestrife (*Lythrum salicaria*), giant reed (*Phragmites australis*), cattails (*Typha spp.*) and reed canary grass (*Phalaris arundinacea*). Target species within upland zones will include, but are not limited to, clovers (*Trifolium spp.*), teasel (*Dipsacus spp.*), sweetclovers (*Melilotus spp.*), Canada thistle (*Cirsium arvense*), biennial thistles (*Carduus nutans, Cirsium vulgare, etc.*) and reed canary grass (*Phalaris arundinacea*). Herbicide treatments will be conducted by State-licensed applicators.

10. REPORTS

An annual report summarizing the results of the previous year's monitoring data will be submitted to the SMC's regulatory division by January 31st of the following year. The annual reports will contain, at a minimum: 1) a narrative summary of the vegetation and hydrology monitoring data; 2) a summary of the progress of native vegetation establishment relative to the performance standards in Sections 8.2.1, 8.2.2 and 8.2.3, in table format; 3) an appendix containing the corresponding monitoring data; 4) photographs of select vegetation monitoring plots, and panoramic views (PMP stations) of the mitigation wetlands and buffer; 5) a narrative summary of the management practices employed during the previous year and photographs documenting these activities; 6) recommendations for proposed management practices to be employed during the following year, based on the monitoring results to date; and 7) the proposed schedule for management practices in the following year.

11. COMPLIANCE AND COMPLETION

11.1 Responsible Parties

Under the IGA, LCFPD is the permittee and responsible party for implementing the mitigation plan described herein until the performance standards listed in Sections 8.2.1, 8.2.2 and 8.2.3 have been met and SMC's regulatory division has provided written sign-off releasing the permittee from further responsibility. The permittee will take corrective measures as necessary to meet the referenced performance standards.

Upon written release from SMC's regulatory division, LCFPD will continue to assume responsibility for long-term management of the wetland and buffer and sufficient funds will be allocated annually to facilitate the management activities necessary to maintain the quality and functionality of the mitigation wetlands and buffer.

11.2. Notification

The permittee (LCFPD) will provide written notification, with supporting information, to SMC's regulatory division at the completion of the compliance period (when the performance standards listed in Sections 8.2.1, 8.2.2 and 8.2.3 are met). The supporting information will include 1) a post-project wetland delineation with surveyed boundaries (using GPS processed to 0.1-ft. horizontal accuracy) shown on a scaled plan (min 1" = 100 ft) and 2) a tabular summary of the credits generated, based on mitigation type.

Upon notification, SMC's regulatory division will review the submitted information and perform a site inspection to evaluate the success of the mitigation. If the

mitigation goals and performance standards have been met, SMC's regulatory division will notify the permittee in writing that the permittee's responsibility for the mitigation site is officially released. A copy of the written release will be provided to the entity designated for long-term management of the mitigation site (LCFPD).

If SMC's regulatory division determines that the mitigation goals or performance standards have not been achieved based on the information submitted and a site inspection, SMC's regulatory division will notify the permittee in writing of the specific shortfalls. The permittee will be granted a specified time period to address the identified shortfalls. Failure to fully address the identified shortfalls within the specified time limit may result in an extended compliance period and withholding of sign-off from SMC's regulatory division.

Exhibit 1: Project Location and Parcel Data

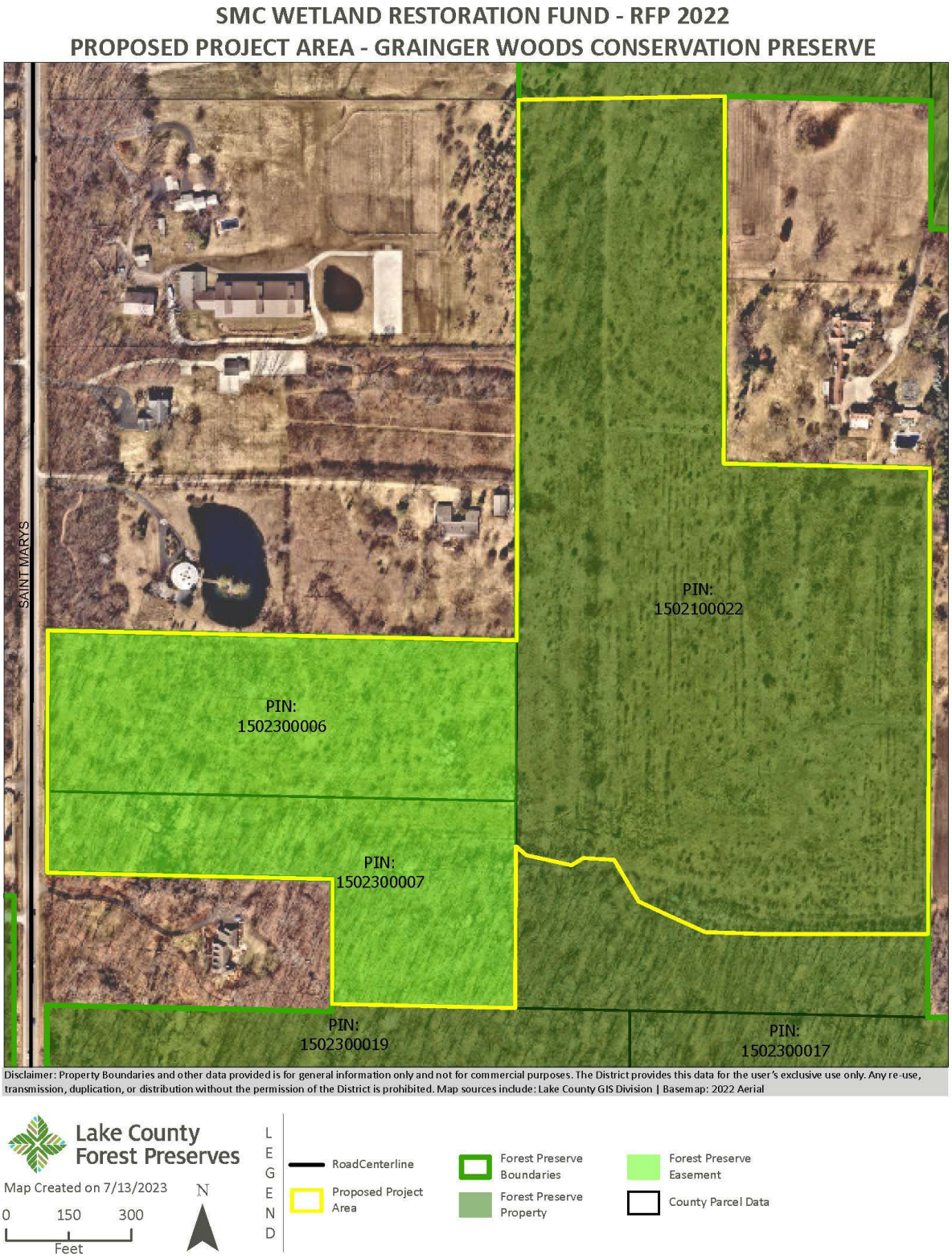


Exhibit 2: Soils Map

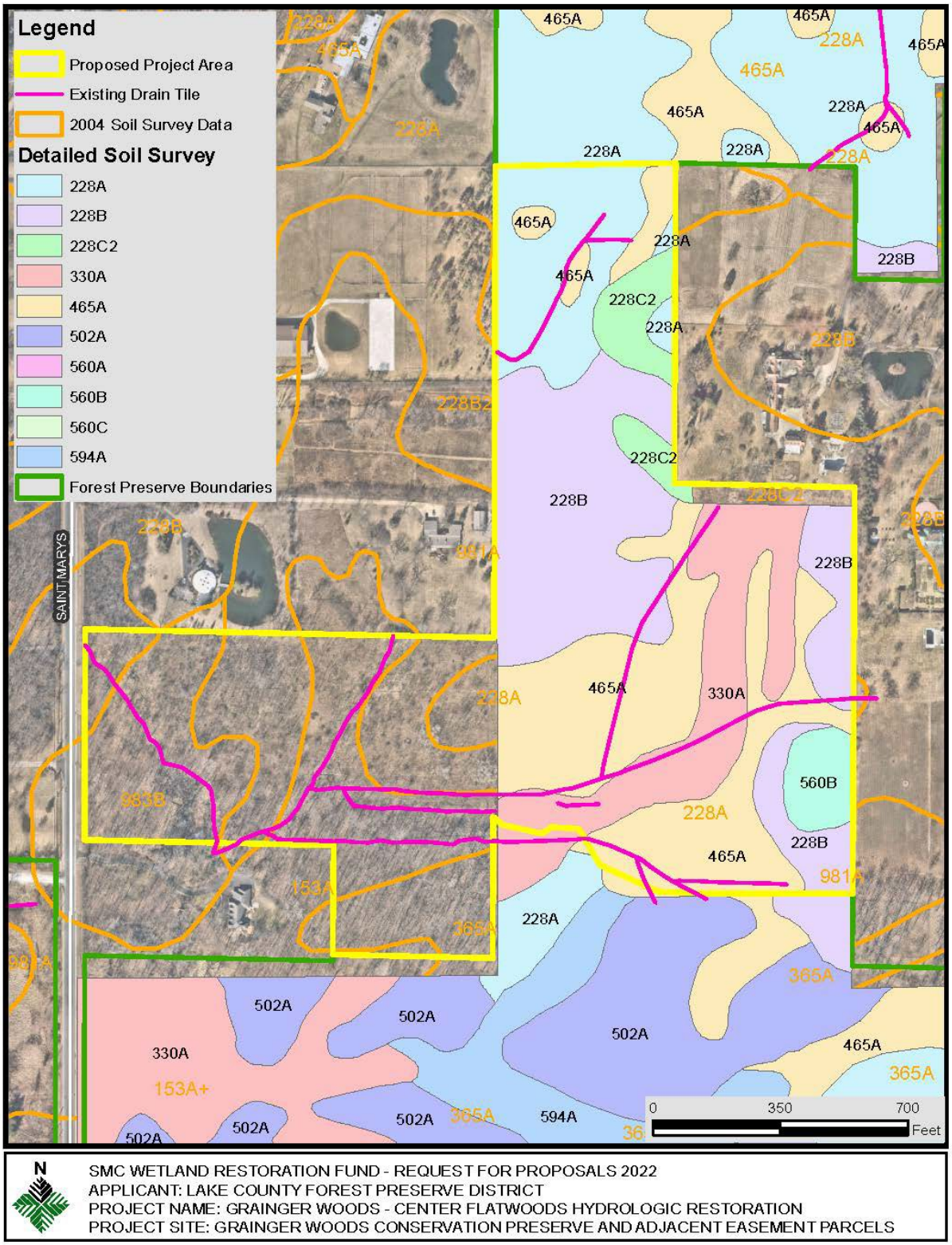


Exhibit 3: Map of HQAR Area, Proposed Mitigation Credit Areas, and Photo/Vegetation/Hydrology Monitoring Locations

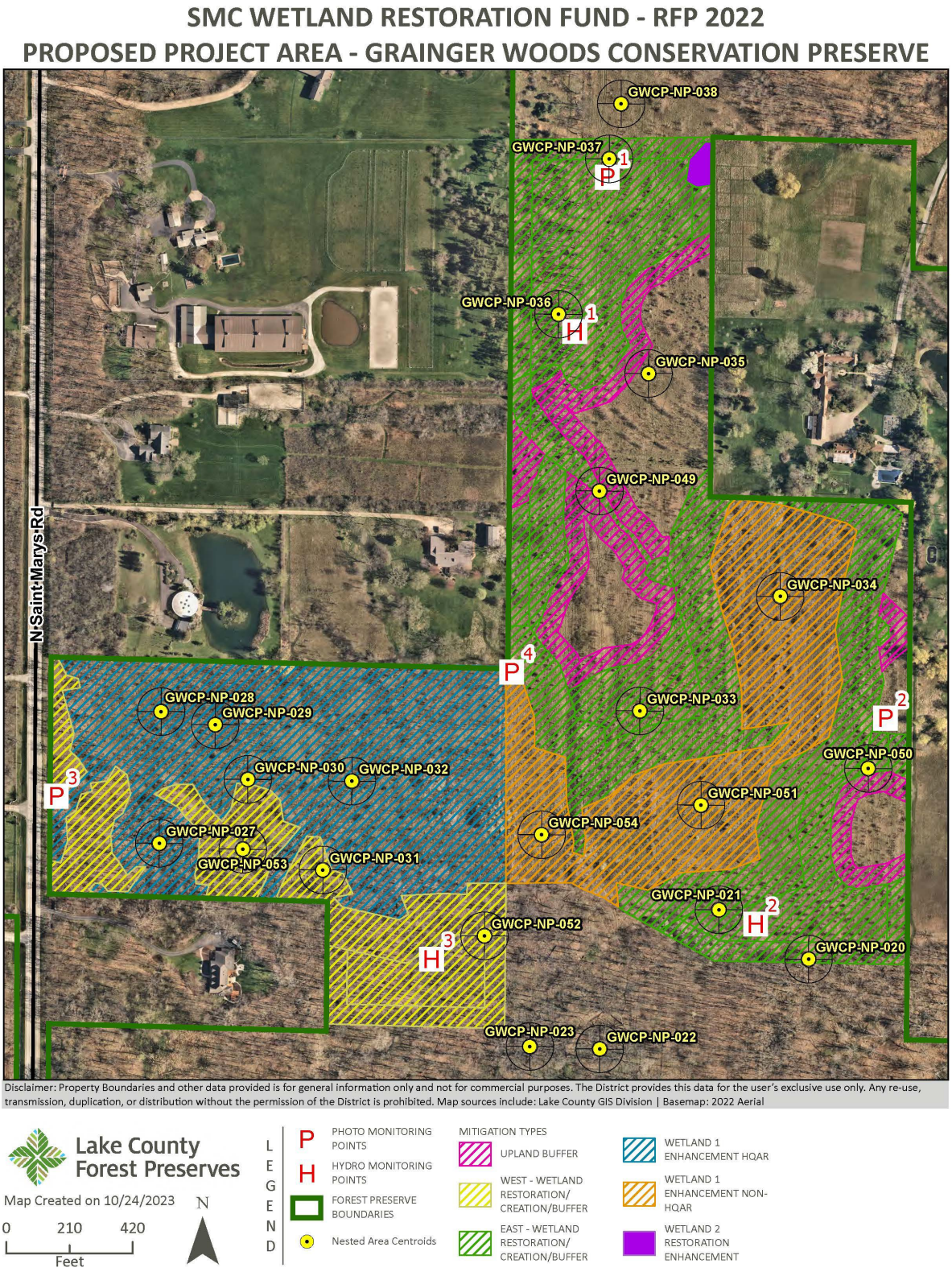


Exhibit 4: Anticipated Project Schedule

Task	Proposed Schedule
Project Administration	October 2023 - 2030
Final Design	October 2023
Permitting	In Progress, anticipate approvals October 2023
Construction	October 2023 - December 2023
Tile Disablement	October 2023 - December 2023
Berm Construction	October 2023 - November 2023
Construction Oversight; DECI Inspections	October 2023 - December 2023
Operations and Maintenance	January 2024 - September 2024
Bidding Seed Purchase; Phase 1	March 2024
Bidding Seed Purchase; Phase 2+	March 2025*
Bidding Invasive Species Control; Phase 1	August 2024
Bidding Invasive Species Control; Phase 2+	August 2025*
Bidding Plant Plug Purchase/In-house Grow	October 2024
Plant Plug Installation	June 2025
Native Seed Installation; Phase 1 (In-house)	November 2023 - January 2024
Native Seed Installation; Phase 2+ (In-house)	November 2024 - January 2025*
Performance Monitoring	June 2025 - September 2030
Mitigation Sign-off**	October 2030

** subsequent phases will be determined by LCFPD Project Manager and will be performed on an 'as needed' basis*

*** sign off may require final wetland delineation and report creation/submittal*

APPENDIX A

PERFORMANCE SUMMARY DATA SHEETS

LCFPD Grainger Woods Hydrologic Restoration Project - Performance Summary

Performance Criterion		Enhanced Wetland 1		Enhanced Wetland 2***
		Non-HQAR	HQAR	
Floristic Quality				
1	Native mean C > or = to 3.5		n/a	n/a
2	Native FQI > or = to 20		n/a	n/a
3	Native mean C > or = to 4.37	n/a		n/a
4	Native FQI > or = to 53.71	n/a		n/a
5	Native mean C > or = to 3.19	n/a	n/a	
6	Native FQI > or = to 14.62	n/a	n/a	
Mean Wetness Coefficient				
7	Mean W shall be < or = 0.00		n/a	n/a
8	Mean W shall be < or = -0.90	n/a	n/a	
9	Mean W shall be < or = -0.52	n/a		n/a
Vegetative Cover				
10	No area > 10 s.f. shall be devoid* of vegetation			
11	Non-native woody species < 10% cover	n/a		n/a
Invasive Species Dominance				
12	None of the three dominant** plants shall be non-native or weedy species.			
Plant-Pollinator Functional Lift				
13	Native pollinator species richness ≥ 20	n/a		n/a
14	Interactive evenness ≥ 0.6			
15	Nestedness ≥ 15			

* Areas with less than 10% vegetation based on percent areal cover.

** Based on percent areal cover or abundance

*** FQA to be performed during final delineation for the mitigation project (no plot data collection at this site).

LCFPD Grainger Woods Hydrologic Restoration Project - Performance Summary

Performance Criterion	Created/Restored Wetland	
	West	East
Floristic Quality		
1 Native mean C > or = to 3.5		
2 Native FQI > or = to 20		
Mean Wetness Coefficient		
7 Mean W shall be < or = 0		
Vegetative Cover		
6 No area > 10 s.f. shall be devoid* of vegetation		
Invasive Species Dominance		
7 None of the three dominant** plants shall be non-native or weedy species.		

* Areas with less than 10% vegetation based on percent areal cover.

** Based on percent areal cover or abundance

LCFPD Grainger Woods Hydrologic Restoration Project - Performance Summary

	Performance Criterion	Upland Buffer
Floristic Quality		
1	Native mean C > or = to 2.5	
2	Native FQI > or = to 15	
Vegetative Cover		
3	No area > 10 s.f. shall be devoid* of vegetation	
Invasive Species Dominance		
4	None of the three dominant** plants shall be non-native or weedy species.	

* Areas with less than 10% vegetation based on percent areal cover.

** Based on percent areal cover or abundance

APPENDIX B

HYDROLOGIC RESTORATION PLAN SET

Lake County Forest Preserve District
Grainger Woods
Hydrologic Restoration Project

Client:

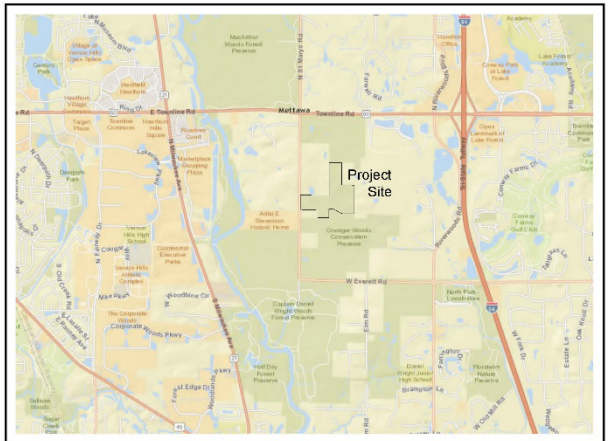
Lake County Forest Preserve District
Mr. Matthew Ueltzen
1899 West Winchester Road
Libertyville, Illinois 60048
Ph: 847-968-3275

Engineer:

Hey and Associates, Inc.
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888

Benchmark:

Chiseled "X" at top southwest corner of existing weir.
N 2026241.109
E 1092843.273
Elevation = 647.30 (NAVD 88)
As established by LCFPD.
West of Adlai E Stevenson Historic Home.



Scale = 1" = 2000'

Project Area

Sheet Index: (Sheet # / Drawing # / Title)

Call J.U.L.I.E. 1-800-892-0123 at least 48 hours before start of construction with the following:

County: Lake
City or Township: Vernon
Tier, Range & Section: T43N, R11E, Sec. 2, 3 & 10

The information shown on this drawing concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. The Contractor is responsible for making his own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.

PROFESSIONAL SEAL

Signature:
Date:
License Expires:

This document shall not be considered a valid technical submittal unless it bears an original seal and signature.

Base Survey Information provided by:
Lake County 1 ft Contours, LCFPD Survey

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com
Professional Design Firm
License No. 184-002429

Lake County Forest Preserve District

Grainger Woods Hydrologic Restoration Project

Cover Sheet

PROJECT NO	22-0235
DESIGNED BY	PSA
DRAWN BY	PSA
CHECKED BY	DAK
APPROVED BY	DAK
DATE	09/20/2023

DRAWING NO. C1.0
SHEET NO. 1 OF 11

For Permit

CONSTRUCTION NOTES

1. The Contractor shall be required to attend a pre-construction meeting with Owner prior to the start of construction to review shop drawing procedures, construction methods, phasing, sequencing and to establish a well defined construction schedule.
2. Contractor shall submit a construction schedule to the Owner prior to the start of construction. The Contractor shall inform the Owner to all changes in the construction schedule as soon as they become apparent.
3. The project shall be constructed in the following general sequence of construction. If phased construction is shown on the plans, the work for each phase shall follow this general sequence of construction.
   - A. Mobilization
   - B. Install erosion control and resource protection measures
     1. Stabilized construction entrance
     2. Silt fence and compost filter berms
     3. Tree protection construction fencing and barricades
     4. Clear corridor
   - C. Earthwork
     1) Excavate ditches
     2) Grade trail subgrade
     3) Rough grade trail sides with on-site topsoil
     4) Install topsoil windrow on all trail edges
   - D. Install proposed culverts
   - E. Proof roll subgrade
   - F. Install aggregate base course
   - G. Perform density testing on base course
   - H. Install surface course
   - I. Perform density testing on surface course
   - J. Fine grade, seed and stabilization of all disturbed areas
   - K. Clean up and complete phase
   - L. Perform fine grading/final dragging of surface course
   - M. Barricade off with construction fence

Approval from Owner shall be obtained prior to proceeding with subsequent steps

4. Any changes to sequence shall be approved in writing by Owner.
5. The centerline of the proposed trail has been previously marked with numbered white carsonite markers. Site benchmarks and control points are shown on the drawings. Any additional layout of lines and grades or any other surveying required to construct the proposed improvements shall be the responsibility of the Contractor.
6. Contractor shall install erosion control measures and tree/construction fencing prior to the start of construction.
7. The Contractor shall work in the cleared corridor. If additional clearing is required to construct any of the proposed improvements either within the cleared corridor or outside the cleared corridor it shall be the responsibility of the Contractor and shall be considered incidental to the trail construction and no additional compensation will be provided.
8. The proposed lines and grades shown on the construction plans represent finished grade elevations.
9. Contractor shall grade subgrade to lines and grades shown on the construction plans in accordance with specifications and details.
10. Subgrade shall be prepared per specifications and compacted to a minimum of ninety five percent (95%) based on standard proctor, in accordance with ASTM D-698 and the standard specifications.
11. When proof rolling of subgrade reveals in the Owner's and/or Engineer's opinion unstable areas or unsuitable soil is encountered, it shall be undercut and removed only as directed by the Owner/Engineer.
12. If in the Owner's and/or Engineer's opinion, unsuitable soil conditions are present, geotechnical fabric and porous granular embankment shall be used in areas only as directed by the Owner/Engineer to stabilize the subgrade in accordance with the specifications.
13. Subgrade shall be approved by Owner and/or Engineer and shall be smooth, clean of all debris and free of ruts, pot holes, etc. prior to placement of aggregate base course.
14. Aggregate base course for trails shall be placed with a paver box or other method to ensure uniform width, depth, crown and final surface smoothness.
15. Aggregate base course shall be compacted with a small roller, half the trail width at a time (to preserve the crown) to a minimum of ninety-five percent (95%) standard proctor, in accordance with the specifications. Any portion of the trail without the specified crown will not be accepted by the Owner.
16. Aggregate base course shall be approved by Owner and shall be smooth, clean of all debris and free of ruts, pot holes, etc. prior to the placement of aggregate surface and/or bituminous surfacing.
17. Aggregate surface course for trails shall be FA-21 in accordance with specifications. Limestone screenings are not acceptable. Screenings shall consist of 100% crushed material. Samples of the specified material shall be submitted to Owner for review and approval prior to placement.
18. Aggregate surface course for trails shall be placed with a paver box or other method to ensure uniform width, depth, crown and final surface smoothness.
19. Bituminous surface course shall be placed with a paver box to ensure uniform width, depth, crown and final surface smoothness.
20. Aggregate surface course for trails shall be compacted with a small roller, half the trail width at a time (to preserve the crown) to a minimum of ninety-five percent (95%) standard proctor, in accordance with the specifications. Any portion of the trail without the specified crown will not be accepted by the Owner.
21. Ditching shall be constructed at locations and lines and grades shown on construction plans. Erosion control blanket shall be installed adjacent to trail edges, on bottom of all proposed ditches and on all slopes steeper than 3-feet horizontal to 1-foot vertical.
22. Culverts shall be high density polyethylene (HDPE) pipe with smooth-wall interior as manufactured by Advanced Drainage Systems (ADS) N-12 pipe, or approved equal, except as otherwise noted and be in accordance with the specifications.
23. The culverts shall be of the type, number, diameter, and length specified on the plans.
24. All culverts shall have corrugated steel flared end sections or end walls at both upstream and downstream ends except as otherwise noted.
25. All culverts shall be installed to inverts shown on the construction plans and be installed per manufacturers directions and meet all requirements of the specifications.
26. Riprap shall be placed at locations specified on construction plans. The riprap shall be of class designating diameter and gradation, but shall be field stone cobbles as specified in the specifications. Limestone riprap is not acceptable. Samples of specified material shall be submitted to Owner for approval prior to delivery and placement.
27. For final restoration, grading, topsoil placement, seeding, trail edge work, and other landscaping certification requirements see Attachment D of the contract documents.
28. All topsoil shall be stripped and salvaged from trail excavation and other site grading operations, stockpiled and re-spread. Pulverized topsoil shall be supplied and installed only if in the Owner's opinion sufficient on-site topsoil is not available.
29. The Owner expects that a significant amount of handwork will be required to ensure a clean, smooth horizontal trail edge and smooth transition is achieved between the edge of the trail and grassed areas. High areas along the edge of the trail that block flow off the trail or overspill of topsoil or surface material will not be tolerated.
30. All disturbed areas to receive a minimum of 4 inches of topsoil and be seeded as specified on the construction plans and specifications.
31. Areas to be seeded shall be firm but not compacted and shall be fine graded to a smooth and natural contour prior to seeding. All rocks, sticks, roots, clods, and debris greater than one-inch shall be removed and disposed of off-site.
32. A starter fertilizer of 18-18-18 Nitroform analysis per the specifications shall be applied and worked into soil seeding areas designated as LCFP Class 2. Prior to seeding or sodding, fertilizer shall be spread uniformly at a rate of 6 pounds per 1000 square feet.
33. Immediately after rolling seeded area, erosion control blanket shall be placed adjacent to trail edge, on all slopes steeper than 3-feet horizontal to 1-foot vertical, on the bottom of all ditches, and in other areas designated on the plans.
34. Immediately after rolling seeded areas and installing erosion control blanket, mulch shall be applied at a rate of 3000 lbs per acre within 24-hours after seeding. Use Hydromulch on all seeded areas unless otherwise approved or specified.
35. The first six (6) feet immediately adjacent to the trails edge, and at other locations depicted on the construction drawings, shall be seeded with LCFP Class 2-lawn mixture and all other areas shall be seeded with the native mixture depicted on the construction drawings.
36. On-site stockpile, borrow and staging areas shall be graded so as not to block or change existing drainage patterns, as directed by Engineer. These areas shall be restored with a minimum of 4-inches of topsoil and be seeded with the native mixture as specified on construction plans and specifications (cost incidental).
37. Existing asphalt roads, parking lots and gravel trails are to remain open, safe, and in an accessible condition for public use at all times during the construction of this project unless otherwise designated. Access through and over these roads, parking lots and trails shall be kept to a minimum.
38. Contractor shall take all necessary and reasonable precautions to prevent any damage to existing trees, foliage, plant materials, wetlands, structures, roads, parking lots, trails, turf areas, finished topsoil areas, and other property of Owner, the public, or private entities.
39. Any area disturbed by the Contractor shall be restored to its original condition by the Contractor and at the Contractor's expense. The opinion of the Owner shall be final in determining the acceptability of restored areas. Owner's absolute desire is that no such area be disturbed in the slightest degree, and Contractor must impress its entire field organization with this sense of personal responsibility to preserve the existing state of the site and surrounding public and private areas.

EARTHWORK AND GRADING CONSTRUCTION

All work done under this heading will be done in accordance with applicable provisions of the "Standard Specifications for Road and Bridge Construction", State of Illinois, Department of Transportation, adopted April 1, 2016.

1. Work under this section shall include, but not be limited to, the following:
   - a. Clearing and removal of all undesirable vegetative growth within the construction area except as noted otherwise on the plans.
   - b. Removing unsuitable materials as specified from parking, roadway, building and other designated areas.
   - c. Clay cut and clay fill with compaction within parking, roadway, building and other designated areas.
   - d. Excavation and grading of the entire site per plan, including construction of berms, swales, etc., as shown on these plans.
   - e. Placement and construction of structural and non-structural fills.
   - f. If required, removal from site and disposal of any excess or unsuitable material upon completion of mass grading.
   - g. Movement and compaction of spoil material from the construction of underground utilities.
   - h. Final shaping and trimming to the lines, grades and cross-sections shown in these plans, and topsoil placement to design finish grade elevations.
   - i. Soil erosion control measures in accordance with the applicable specifications and county requirements.
2. Silt fence as shown in the construction plans shall be erected prior to mass earthwork.
3. It is the Contractor's responsibility to determine all material quantities and apprise himself of all site conditions. No claims for extra work will be recognized unless ordered in writing by the Owner.
4. The grading operations are to be closely supervised and inspected, particularly during the removal of unsuitable material and the construction of embankments, by the geotechnical engineer or his representative. All testing, inspection and supervision of soil quality, unsuitable removal and its replacement, and other soils related operations shall be entirely the responsibility of the geotechnical engineer.
5. The grading and construction of the site improvements shall not cause ponding of stormwater except as noted on the plans. All areas adjacent to these improvements shall be graded to allow positive drainage.
6. The proposed grading elevations shown on the plans are finish grade. A minimum of six inches (6") of topsoil is to be placed before finish grade elevations are achieved, except where noted otherwise.
7. All disturbed areas to be be sodded or seeded with IDOT Class 1 (lawn mixture) seed mixture.

SEDIMENTATION AND EROSION CONTROL NOTES

1. Sediment control measures shall be installed prior to the commencement of hydrologic disturbance of upland areas.
2. For those developments that require a designated erosion control inspector (DECI), inspections and documentation shall be performed, at a minimum:
   - Upon completion of sediment and runoff control measures (including perimeter controls and diversions), prior to proceeding with any other earth disturbance or grading.
   - After every seven (7) calendar days or storm event with greater than 0.5 inch of rainfall or liquid equivalent precipitation.
3. Soil disturbance shall be conducted in such a manner as to minimize erosion. If stripping, clearing, grading, or landscaping are to be done in phases, the permittee shall plan for appropriate soil erosion and sediment control measures.
4. A stabilized mat of crushed stone meeting IDOT gradation CA-1 underlain with filter fabric and in accordance with the Illinois Urban Manual, or other appropriate measures(s) as approved by the Enforcement Officer, shall be installed at any point where traffic will be entering or leaving a construction site. Sediment or soil reaching an improved public right-of-way, street, alley or parking area shall be removed by scraping or street cleaning as accumulations warrant and transported to a controlled sediment disposal area.
5. Temporary diversions shall be constructed as necessary to direct all runoff from hydrologically disturbed areas to an appropriate sediment trap or basin.
6. Disturbed areas shall be stabilized with temporary or permanent measures within seven (7) calendar days following the end of active hydrologic disturbance or redisturbance.
7. All stockpiles shall have appropriate measures to prevent erosion. Stockpiles shall not be placed in flood prone areas or wetlands and designated buffers.
8. Slopes steeper than 3H:1V shall be stabilized with appropriate measures as approved by the Enforcement Officer.
9. Appropriate erosion control blanket shall be installed on all interior detention basin side slopes between the normal water level and high water level.
10. Storm sewers that are or will be functioning during construction shall be protected by an appropriate sediment control measure.
11. If dewatering services are used, adjoining properties and discharge locations shall be protected from erosion and sedimentation. Discharges shall be routed through an approved anionic polymer dewatering system or a similar measure as approved by the Enforcement Officer. Dewatering systems should be inspected daily during operational periods. The Enforcement Officer, or approved representative, must be present at the commencement of dewatering activities.
12. If installed soil erosion and sediment control measures do not minimize sediment leaving the development site, additional measures such as anionic polymers or filtration systems may be required by the Enforcement Officer.
13. All temporary and permanent erosion control measures must be maintained and repaired as needed. The property owner shall be ultimately responsible for maintenance and repair.
14. All temporary sediment control measures shall be removed within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed.
15. The erosion control measures indicated on the plans are the minimum requirements. Additional measures may be required, as directed by the Engineer, Enforcement Officer, or other governing agency.

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Lake County Forest Preserve District

Grainger Woods Hydrologic Restoration Project

General Notes

PROJECT NO.	22-0230	DRAWING NO.
DESIGNED BY	PSA	C1.1
DRAWN BY	PSA	
CHECKED BY	DAK	
APPROVED BY	DAK	SHEET NO.
ISSUE DATE	02/20/2023	2 of 11

For Permit

Flatwoods			
SPECIES NAME	SPECIES SUBSTITUTIONS	COMMON NAME	SEED/ACRE (oz)
Graminoids			
Calamagrostis canadensis	DF*	BLUE JOINT GRASS	0.1
Carex annectens		LARGE YELLOW FOX SEDGE	0.2
Carex cristatella		CRESTED OVAL SEDGE	0.2
Carex crus corvi		CROWFOOT FOX SEDGE	1.4
Carex grayi		COMMON BUR SEDGE	5
Carex grisea		WOOD GRAY SEDGE	1
Carex intumescens		SHINING BUR SEDGE	3
Carex lacustris		COMMON LAKE SEDGE	0.8
Carex lupulina		COMMON HOP SEDGE	6
Carex molesta		FIELD OVAL SEDGE	0.3
Carex pellita	Carex languinosa	BROAD-LEAVED WOOLLY SEDGE	0.5
Carex projecta		LOOSE-HEADED OVAL SEDGE	0.2
Carex radiata		STRAIGHT-STYLED WOOD SEDGE	0.4
Carex retrorsa		DEFLEXED BOTTLE-BRUSH SEDGE	0.5
Carex scoparia		LANCE-FRUITED OVAL SEDGE	0.2
Carex squarrosa		NARROW-LEAVED CATTAIL SEDGE	0.9
Carex stipata		COMMON FOX SEDGE	1
Carex tribuloides		AWL-FRUITED OVAL SEDGE	0.2
Carex vesicaria monile		TUFTED LAKE SEDGE	1.6
Carex vulpinoidea		BROWN FOX SEDGE	1.6
Cinna arundinacea		COMMON WOOD REED	0.7
Elymus virginicus		VIRGINIA WILD RYE	6
Glyceria striata		FOWL MANNA GRASS	0.1
Glyceria septentrionalis		FLOATING MANNA GRASS	0.1
Leersia oryzoides		RICE CUT GRASS	0.1
Poa palustris		MARSH BLUE GRASS	0.1
Scirpus cyperinus		WOOL GRASS	0.05
Forbs			
Alisma subcordatum		COMMON WATER PLANTAIN	0.1
Asclepias incarnata	DF*	SWAMP MILKWEED	1
Aster lateriflorus	DF*	SIDE-FLOWERING ASTER	0.1
Bidens frondosa		COMMON BEGGAR'S TICKS	0.1
Camassia scilloides		WILD HYACINTH	0.1
Chelone glabra		TURTLEHEAD	0.2
Cicuta maculata		WATER HEMLOCK	1
Dioscorea villosa		WILD YAM	0.1
Eupatorium perfoliatum	DF*	COMMON BONESET	0.08
Iris virginica shrevei		BLUE FLAG	2
Lobelia cardinalis		CARDINAL FLOWER	0.2
Lobelia inflata		INDIAN TOBACCO	0.1
Lobelia siphilitica		GREAT BLUE LOBELIA	0.1
Lycopus rubellus		STALKED WATER HOREHOUND	0.1
Lysimachia ciliata		FRINGED LOOSESTRIFE	0.3
Rudbeckia laciniata		WILD GOLDEN GLOW	1
Rudbeckia triloba		BROWN-EYED SUSAN	0.1
Rumex orbiculatus		GREAT WATER DOCK	1
Sagittaria latifolia		COMMON ARROWHEAD	0.1
Saxifraga pensylvanica		SWAMP SAXIFRAGE	0.1
Scutellaria lateriflora		MAD-DOG SKULLCAP	0.35
Solidago patula	DF*	SWAMP GOLDENROD	0.1
Thalictrum dasycarpum		PURPLE MEADOW RUE	0.4
*Pure seed: de-fluffed (DF), de-hulled (DH)			

Mesic / Transitional			
SPECIES NAME	SPECIES SUBSTITUTIONS	COMMON NAME	SEED/ACRE (oz)
Graminoids			
Bromus pubescens	Bromus purgans	WOODLAND BROME	1
Carex annectens		LARGE YELLOW FOX SEDGE	0.2
Carex cephalophora		SHORT-HEADED BRACTED SEDGE	0.25
Carex cristatella		CRESTED OVAL SEDGE	0.1
Carex davisii		AWNED GRACEFUL SEDGE	3
Carex gracillima		PURPLE-SHEATHED GRACEFUL SEDGE	1.3
Carex grayi		COMMON BUR SEDGE	1.5
Carex grisea		WOOD GRAY SEDGE	0.5
Carex hirtifolia		HAIRY WOOD SEDGE	0.1
Carex jamesii		GRASS SEDGE	0.5
Carex lupulina		COMMON HOP SEDGE	1
Carex molesta		FIELD OVAL SEDGE	2
Carex normalis		SPREADING OVAL SEDGE	0.2
Carex pellita	Carex languinosa	BROAD-LEAVED WOOLLY SEDGE	0.1
Carex radiata		STRAIGHT-STYLED WOOD SEDGE	0.1
Carex scoparia		LANCE-FRUITED OVAL SEDGE	0.1
Carex sparganioides		LOOSE-HEADED BRACTED SEDGE	0.5
Carex sprengelii		LONG-BEAKED SEDGE	0.2
Carex tenera		NARROW-LEAVED OVAL SEDGE	0.6
Carex vulpinoidea		BROWN FOX SEDGE	1
Cinna arundinacea		COMMON WOOD REED	0.7
Elymus canadensis		CANADA WILD RYE	18
Elymus virginicus		VIRGINIA WILD RYE	24
Festuca obtusa		NODDING FESCUE	0.5
Glyceria striata		FOWL MANNA GRASS	0.1
Hystrix patula		BOTTLEBRUSH GRASS	4
Muhlenbergia mexicana		LEAFY SATIN GRASS	0.1
Sphenopholis intermedia		SLENDER WEDGE GRASS	0.1
*Pure seed: de-fluffed (DF), de-hulled (DH)			

SEED MIX PLACEMENT NOTES

Placement of specified seed mixes shall be field verified by Lake County Forest Preserve District.

Mesic / Transitional			
SPECIES NAME	SPECIES SUBSTITUTIONS	COMMON NAME	SEED/ACRE (oz)
Forbs			
Agastache nepetoides		YELLOW GIANT HYSSOP	0.15
Agastache scrophulariaefolia		PURPLE GIANT HYSSOP	0.1
Allium canadense		WILD ONION	2
Allium tricoccum		WILD LEEK	1
Anemone quinquefolia	DF*	WOOD ANEMONE	0.1
Aquilegia canadensis		WILD COLUMBINE	0.2
Arisaema triphyllum		JACK-IN-THE-PULPIT	1
Asarum canadense		WILD GINGER	0.25
Asclepias exaltata	DF*	POKE MILKWEED	0.5
Asclepias incarnata	DF*	SWAMP MILKWEED	0.2
Aster drummondii	DF*		0.1
Aster lateriflorus	DF*	SIDE-FLOWERING ASTER	0.1
Aster macrophyllus	DF*	BIG-LEAVED ASTER	0.1
Aster sagittifolius	DF*	ARROW-LEAVED ASTER	0.1
Blephilia hirsuta		WOOD MINT	0.1
Camassia scilloides		WILD HYACINTH	0.1
Campanula americana		TALL BELLFLOWER	0.2
Cryptotaenia canadensis		HONEWORT	1
Dentaria laciniata		TOOTHWORT	0.1
Dioscorea villosa		WILD YAM	0.1
Eupatorium perfoliatum	DF*	COMMON BONESET	0.08
Eupatorium purpureum	DF*	PURPLE JOE PYE WEED	0.1
Eupatorium rugosum	DF*	WHITE SNAKEROOT	0.05
Geranium maculatum		WILD GERANIUM	0.5
Helianthus strumosus		PALE-LEAVED SUNFLOWER	1
Hydrophyllum virginianum		VIRGINIA WATERLEAF	0.5
Lilium michiganense		TURK'S CAP LILY	1
Lithospermum latifolium		BROAD-LEAVED PUCCOON	0.2
Lobelia inflata		INDIAN TOBACCO	0.05
Lobelia siphilitica		GREAT BLUE LOBELIA	0.05
Lysimachia ciliata		FRINGED LOOSESTRIFE	0.1
Mitella diphylla		BISHOP'S CAP	0.1
Osmorhiza claytonii		HAIRY SWEET CICELY	2.5
Penstemon digitalis		FOXGLOVE BEARD TONGUE	0.15
Phlox divaricata		WOODLAND PHLOX	0.5
Polemonium reptans		JACOB'S LADDER	0.6
Polygonatum canaliculatum		SMOOTH SOLOMON'S SEAL	0.3
Polygonum virginianum		WOODLAND KNOTWEED	1
Prenanthes alba		LION'S FOOT	0.3
Ranunculus fascicularis		EARLY BUTTERCUP	0.2
Rudbeckia hirta		BLACK-EYED SUSAN	0.5
Rudbeckia laciniata		WILD GOLDEN GLOW	0.3
Rudbeckia subtomentosa		SWEET BLACK-EYED SUSAN	0.1
Rudbeckia triloba		BROWN-EYED SUSAN	0.2
Sanguinaria canadensis		BLOODROOT	0.1
Saxifraga pensylvanica		SWAMP SAXIFRAGE	0.05
Scrophularia lanceolata		EARLY FIGWORT	0.1
Scrophularia marilandica		LATE FIGWORT	0.1
Scutellaria lateriflora		MAD-DOG SKULLCAP	0.2
Smilacina racemosa		FEATHERY FALSE SOLOMON'S SEAL	2
Smilax lasioneura	herbacea	COMMON CARRION FLOWER	0.5
Solidago flexicaulis	DF*	BROAD-LEAVED GOLDENROD	0.2
Solidago ulmifolia	DF*	ELM-LEAVED GOLDENROD	0.1
Taenidia integerrima		YELLOW PIMPERNEL	0.1
Teucrium canadense		GERMANDER	0.2
Thalictrum dasycarpum		PURPLE MEADOW RUE	0.5
Thalictrum dioicum		EARLY MEADOW RUE	0.1
Verbena urticifolia		HAIRY WHITE VERVAIN	0.1
Veronicastrum virginicum		CULVER'S ROOT	0.1
Zizia aurea		GOLDEN ALEXANDERS	0.5
*Pure seed: de-fluffed (DF), de-hulled (DH)			

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
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Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Lake County Forest Preserve District

Grainger Woods Hydrologic Restoration Project

Seed Mix Tables

PROJECT NO. 22-0236		DRAWING NO.
DESIGNED BY	PSA	C1.2
DRAWN BY	PSA	
CHECKED BY	DAK	
APPROVED BY	DAK	SHEET NO.
ISSUE DATE	02/20/2023	3 of 11

For Permit

Upland (Dry)			
SPECIES NAME	SPECIES SUBSTITUTIONS	COMMON NAME	SEED/ACRE (oz)
Graminoids			
Bromus pubescens	Bromus purgans	WOODLAND BROME	2
Carex annectens		LARGE YELLOW FOX SEDGE	0.15
Carex blanda		COMMON WOOD SEDGE	1
Carex cephalophora		SHORT-HEADED BRACTED SEDGE	0.45
Carex davisii		AWNED GRACEFUL SEDGE	1.7
Carex gracillima		PURPLE-SHEATHED GRACEFUL SEDGE	1.3
Carex hirsutella		HAIRY GREEN SEDGE	0.8
Carex hirtifolia		HAIRY WOOD SEDGE	0.1
Carex jamesii		GRASS SEDGE	1
Carex normalis		SPREADING OVAL SEDGE	1
Carex pensylvanica		COMMON OAK SEDGE	0.2
Carex rosea		CURLY STYLED WOOD SEDGE	0.4
Carex sparganioides		LOOSE-HEADED BRACTED SEDGE	0.7
Carex sprengelii		LONG-BEAKED SEDGE	1
Carex tenera		NARROW-LEAVED OVAL SEDGE	0.6
Carex vulpinoidea		BROWN FOX SEDGE	0.1
Cinna arundinacea		COMMON WOOD REED	1
Danthonia spicata		POVERTY OAT GRASS	1
Elymus canadensis		CANADA WILD RYE	24
Elymus villosus		SILKY WILD RYE	16
Elymus virginicus		VIRGINIA WILD RYE	24
Festuca obtusa		NODDING FESCUE	1.2
Glyceria striata		FOWL MANNA GRASS	0.1
Hystrix patula		BOTTLEBRUSH GRASS	10
Muhlenbergia mexicana		LEAFY SATIN GRASS	0.1
Panicum latifolium		BROAD-LEAVED PANIC GRASS	1
Sphenopholis intermedia		SLENDER WEDGE GRASS	0.1
*Pure seed: de-fluffed (DF), de-hulled (DH)			

Upland (Dry)			
SPECIES NAME	SPECIES SUBSTITUTIONS	COMMON NAME	SEED/ACRE (oz)
Forbs			
Actaea pachypoda		WHITE BANEBERRY	1
Agastache scrophulariaefolia		PURPLE GIANT HYSSOP	0.15
Allium canadense		WILD ONION	6
Allium tricoccum		WILD LEEK	2.5
Anemone quinquefolia	DF*	WOOD ANEMONE	0.2
Anemone virginiana	DF*	TALL ANEMONE	0.4
Anemonella thalictroides		RUE ANEMONE	0.2
Aquilegia canadensis		WILD COLUMBINE	0.33
Arisaema triphyllum		JACK-IN-THE-PULPIT	1
Asarum canadense		WILD GINGER	0.25
Asclepias exaltata	DF*	POKE MILKWEED	0.5
Aster cordifolius	DF*	HEART-LEAVED ASTER	0.11
Aster drummondii	DF*		0.1
Aster lateriflorus	DF*	SIDE-FLOWERING ASTER	0.1
Aster macrophyllus	DF*	BIG-LEAVED ASTER	0.4
Aster sagittifolius	DF*	ARROW-LEAVED ASTER	0.1
Blephilia hirsuta		WOOD MINT	0.1
Camassia scilloides		WILD HYACINTH	1
Campanula americana		TALL BELLFLOWER	0.2
Caulophyllum thalictroides		BLUE COHOSH	8
Comandra umbellata		FALSE TOADFLAX	0.5
Cryptotaenia canadensis		HONEWORT	1
Dentaria laciniata		TOOTHWORT	0.1
Dodecatheon meadia		SHOOTING STAR	0.1
Eupatorium purpureum	DF*	PURPLE JOE PYE WEED	0.3
Eupatorium rugosum	DF*	WHITE SNAKEROOT	0.1
Galium concinnum		SHINING BEDSTRAW	0.1
Gentiana flavida		YELLOWISH GENTIAN	0.1
Geranium maculatum		WILD GERANIUM	2.5
Helianthus strumosus		PALE LEAVED SUNFLOWER	3
Hydrophyllum virginianum		VIRGINIA WATERLEAF	1
Isopyrum biternatum		FALSE RUE ANEMONE	0.5
Lilium michiganense		TURK'S CAP LILY	1.3
Lithospermum latifolium		BROAD-LEAVED PUCCOON	1
Lobelia inflata		INDIAN TOBACCO	0.05
Lobelia siphilitica		GREAT BLUE LOBELIA	0.05
Lysimachia ciliata		FRINGED LOOSESTRIFE	0.1
Mitella diphylla		BISHOP'S CAP	0.1
Osmorhiza claytonii		HAIRY SWEET CICELY	5
Pedicularis canadensis		WOOD BETONY	0.33
Penstemon calycosus		SMOOTH BEARD TONGUE	0.1
Penstemon digitalis		FOXGLOVE BEARD TONGUE	0.15
Phlox divaricata		WOODLAND PHLOX	1
Phryma leptostachya		LOPSEED	1
Polemonium reptans		JACOB'S LADDER	0.7
Polygonatum canaliculatum		SMOOTH SOLOMON'S SEAL	0.5
Polygonum virginianum		WOODLAND KNOTWEED	1
Prenanthes alba		LION'S FOOT	0.8
Ranunculus fascicularis		EARLY BUTTERCUP	0.2
Rudbeckia hirta		BLACK-EYED SUSAN	0.5
Rudbeckia laciniata		WILD GOLDEN GLOW	0.6
Rudbeckia subtomentosa		SWEET BLACK-EYED SUSAN	0.1
Rudbeckia triloba		BROWN-EYED SUSAN	0.2
Sanguinaria canadensis		BLOODROOT	0.1
Scrophularia lanceolata		EARLY FIGWORT	0.1
Scrophularia marilandica		LATE FIGWORT	0.1
Silene stellata		STARRY CAMPION	0.3
Smilacina racemosa		FEATHERY FALSE SOLOMON'S SEAL	3
Smilax lasioneura	herbacea	COMMON CARRION FLOWER	1
Solidago flexicaulis	DF*	BROAD-LEAVED GOLDENROD	0.2
Solidago ulmifolia	DF*	ELM-LEAVED GOLDENROD	0.1
Taenidia integerrima		YELLOW PIMPERNEL	0.1
Teucrium canadense		GERMANDER	0.2
Thalictrum dasycarpum		PURPLE MEADOW RUE	0.5
Thalictrum dioicum		EARLY MEADOW RUE	0.2
Triosteum aurantiacum		EARLY HORSE GENTIAN	2
Verbena urticifolia		HAIRY WHITE VERVAIN	0.1
Veronicastrum virginicum		CULVER'S ROOT	0.1
Zizia aurea		GOLDEN ALEXANDERS	0.7
*Pure seed: de-fluffed (DF), de-hulled (DH)			

SEED MIX PLACEMENT NOTES

Placement of specified seed mixes shall be field verified by Lake County Forest Preserve District.

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

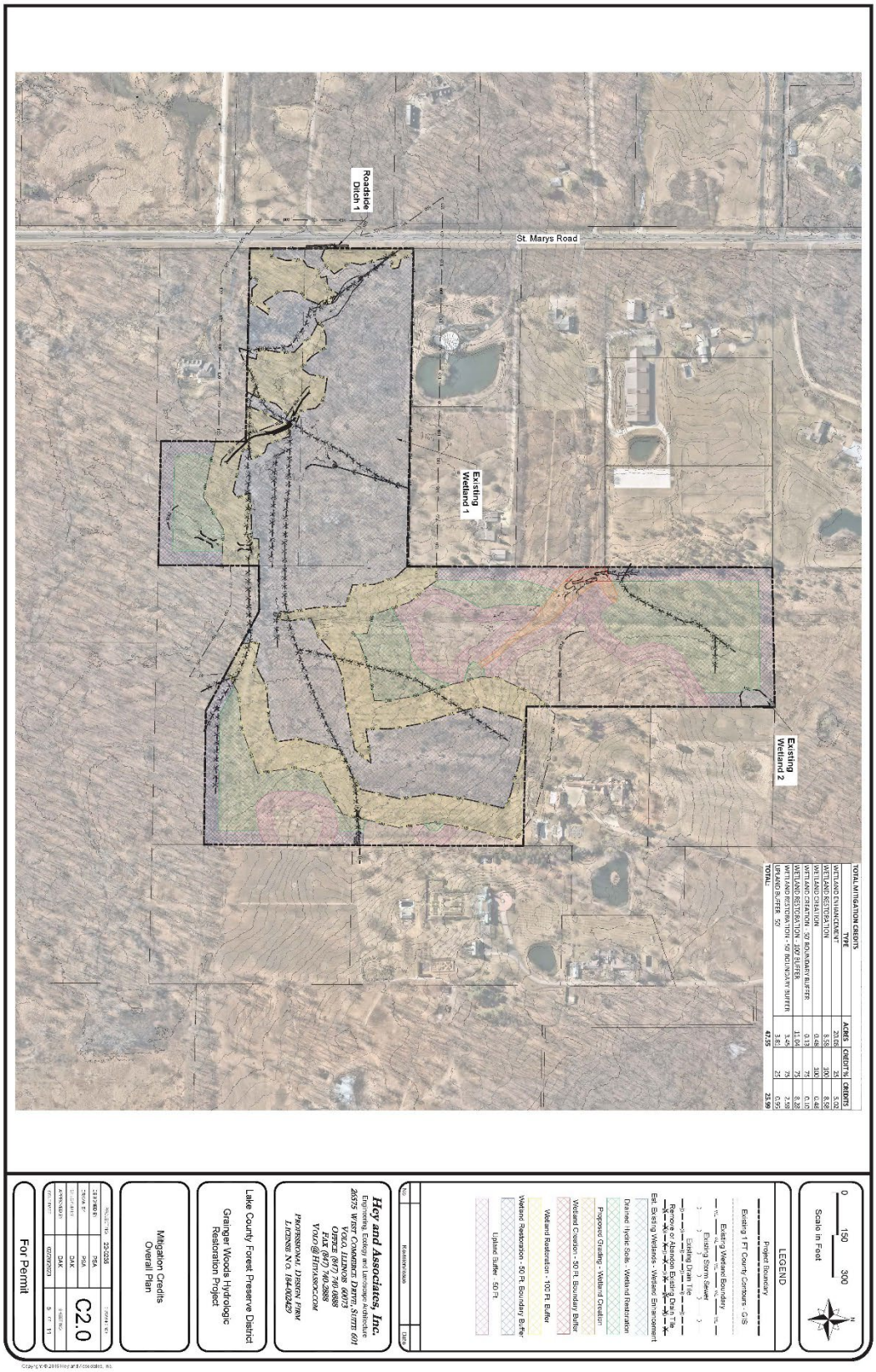
Lake County Forest Preserve District

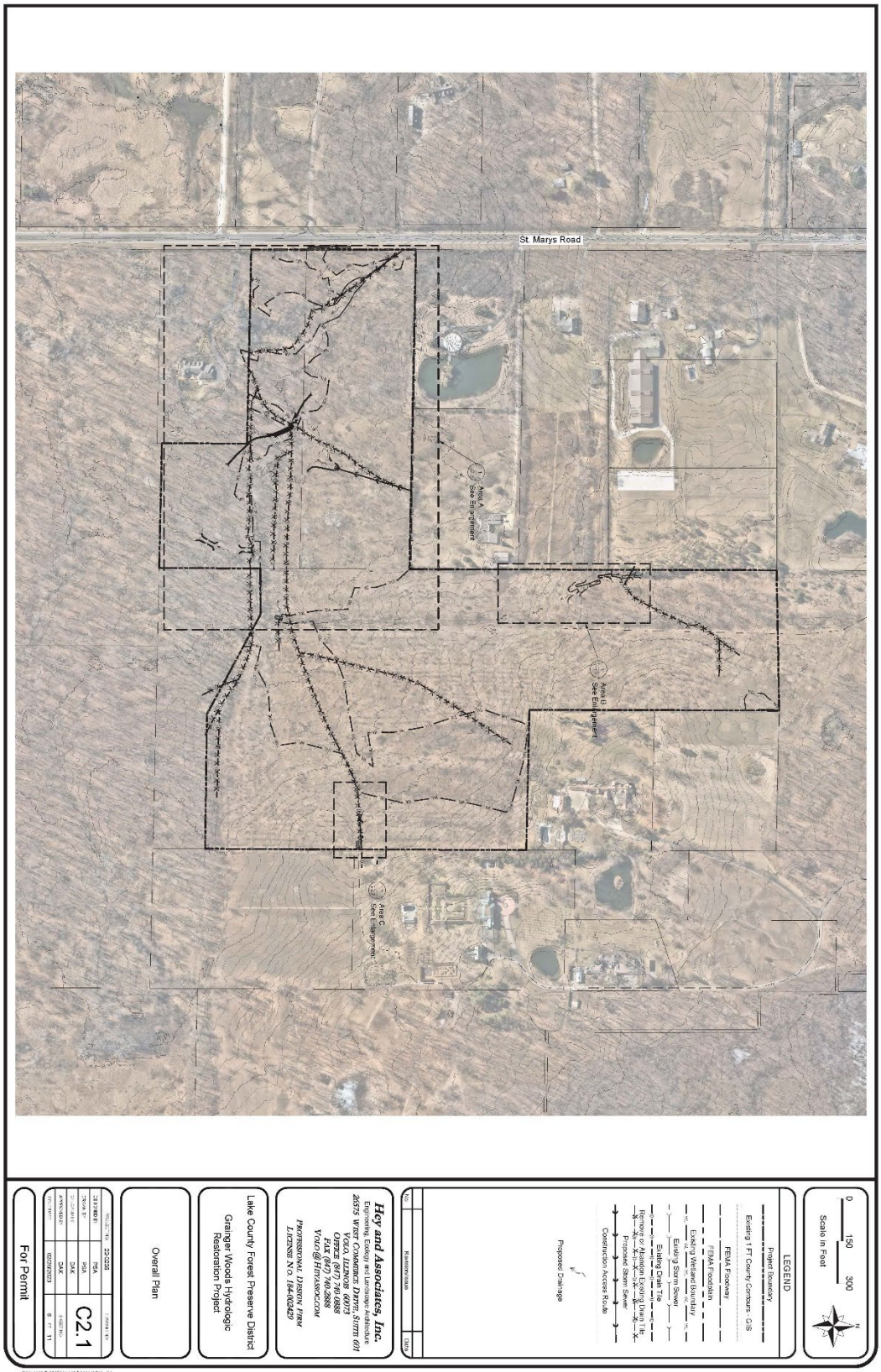
Grainger Woods Hydrologic Restoration Project

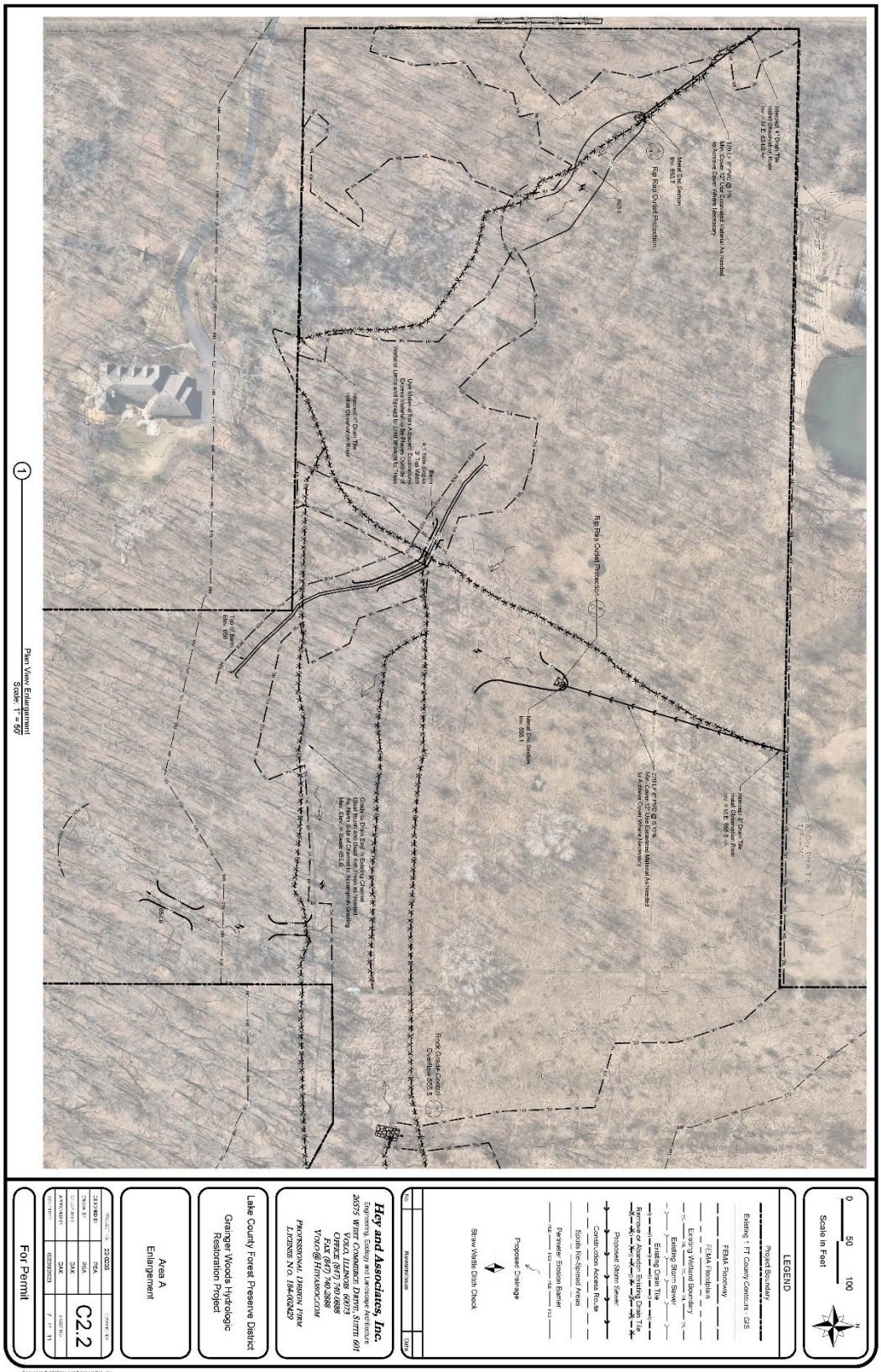
Seed Mix Tables

PROJECT NO.	22-0236	DRAWING NO.
DESIGNED BY	PSA	C1.3
DRAWN BY	PSA	
CHECKED BY	DAK	
APPROVED BY	DAK	SHEET NO.
ISSUE DATE	02/20/2023	4 of 11

For Permit






Scale in Feet
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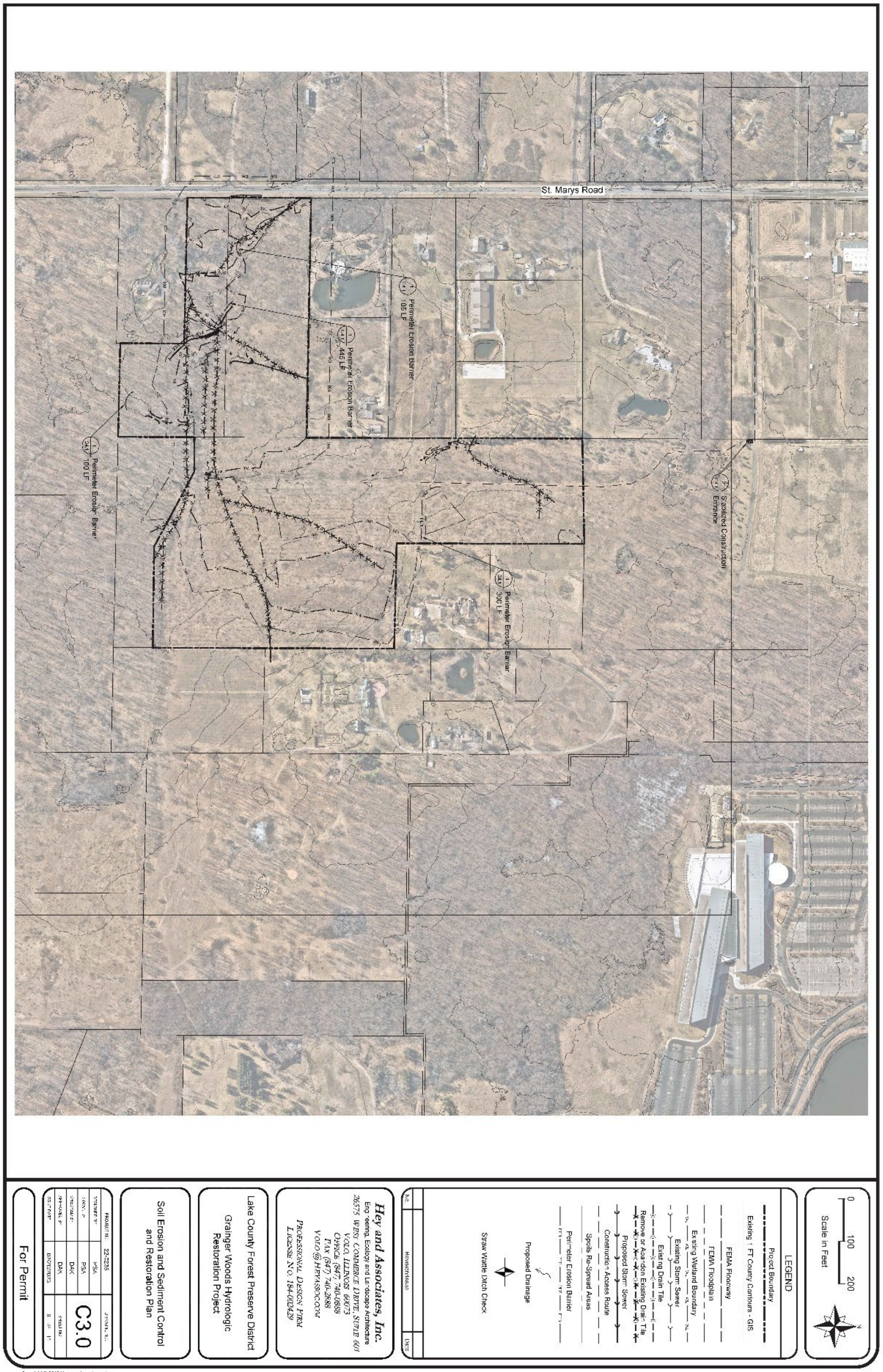
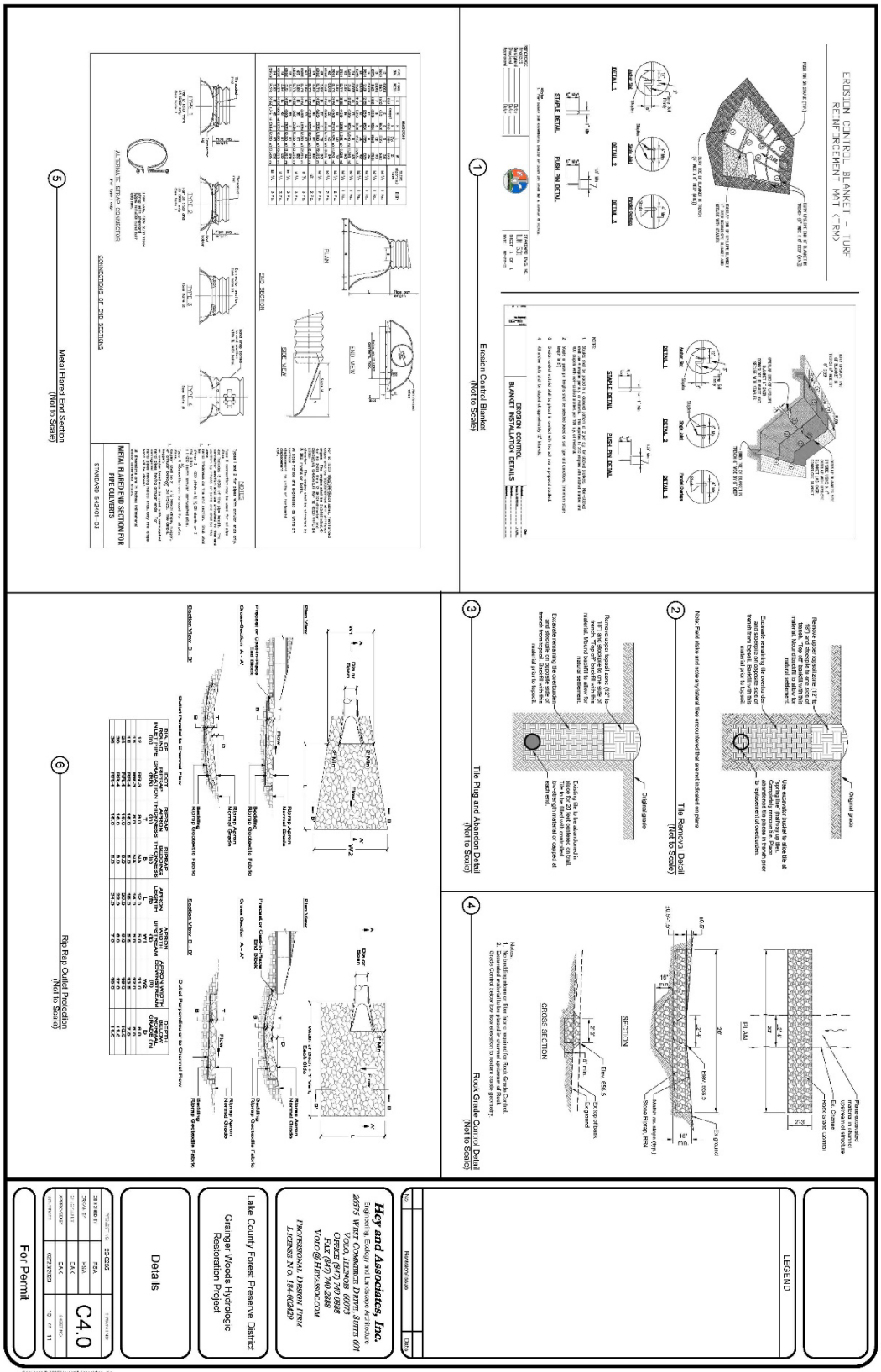
50
100
LEGEND
Project Boundary
Existing 1 FT County Contours GIS
FEMA Floodway
FEMA Floodplain
Existing Wetland Boundary
Existing Storm Sewer
Existing Drain Tile
Proposed Storm Sewer
Construction Access Route
Scale Re-Spread Areas
Perimeter Erosion Barrier
Proposed Drainage
Straw Wattle Ditch Check
No.
Revision/Issue
Date
Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26372 WEST COMMERCE DRIVE, SUITE 601
VOLO, ILLINOIS 60073
OFFICE (847) 740-0888
FAX (847) 740-2888
VOLO@HEYANDASSOC.COM
PROFESSIONAL DESIGN FIRM
LICENSE NO. 184.002429
Lake County Forest Preserve District
Grainger Woods Hydrologic Restoration Project
Area A
Enlargement
For Permit
C2.2
Plan View Enlargement
Scale: 1" = 50'
1
Copyright © 2019 Hey and Associates, Inc.


Plan View Enlargement - Area B
Scale: 1" = 20'
Plan View Enlargement - Area C
Scale: 1" = 20'
673
674
675
676
677
678
669
670
LEGEND
Project Boundary
Existing 1 FT County Contours - GIS
FEMA Floodway
FEMA Floodplain
Existing Wetland Boundary
Existing Storm Sewer
Existing Drain Tile
Proposed Storm Sewer
Construction Access Route
Perimeter Erosion Barrier
Proposed Drainage
Straw Wattle Ditch Check
Scale in Feet
Hey and Associates, Inc.
Lake County Forest Preserve District
Grainger Woods Hydrologic Restoration Project
Areas B and C Enlargements
C2.3
For Permit


St. Marys Road
Perimeter Erosion Barrier
LEGEND
Project Boundary
FEMA Floodway
FEMA Floodplain
Existing Wetland Boundary
Existing Storm Sewer
Existing Drain Tile
Proposed Storm Sewer
Construction Access Route
Spoils Re-Spread Areas
Perimeter Erosion Barrier
Proposed Drainage
Straw Wattle Ditch Check
Scale in Feet
Hey and Associates, Inc.
Lake County Forest Preserve District
Grainger Woods Hydrologic Restoration Project
Soil Erosion and Sediment Control and Restoration Plan
C3.0
For Permit



ROLLED EROSION CONTROL PRODUCTS
STAPLE PATTERN GUIDE
STAKE DETAIL
Ditch Check and Perimeter Erosion Barrier Detail
(Not to Scale)
Stabilized Construction Entrance Detail
(Not to Scale)
LEGEND
Hey and Associates, Inc.
Lake County Forest Preserve District
Grainger Woods Hydrologic
Restoration Project
Details
C4.1
For Permit

APPENDIX C

WETLAND REPORT (PJD)

Hey and Associates, Inc.

Wetland Delineation Report
Grainger Woods
Mettawa, Lake County, Illinois

Project No. 22-0235

Prepared For:
Lake County Forest Preserves
1899 West Winchester Road
Libertyville, Illinois 60048

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Main Office:
26575 W. Commerce Dr., Ste 601
Volo, Illinois 60073
847-740-0888 (phone)
847-740-2888 (fax)

Additional Offices:

Chicago, IL
8755 W. Higgins Rd., Ste 835
Chicago, Illinois 60631
773-693-9200 (phone)
773-693-9202 (fax)

Richland Center, WI
20442 County Highway G
Richland Center, Wisconsin 53581
847-740-0888 (phone)
847-740-2888 (fax)

Illinois Professional Design Firm 184.002429 / Wisconsin Architectural and Engineering License # 2340-11
Staff licensed to practice in Illinois, Wisconsin, Indiana, Michigan and Oregon
IDOT and WisDOT Prequalified

April 14, 2023

Table of Contents

Grainger Woods Wetland Delineation Report

Introduction

A wetland delineation of the project site was conducted at the request of the Lake County Forest Preserves. The project site is located on the east side St. Mary's Road in the Village of Mettawa, Lake County, Illinois (Exhibit 1). The site is further located in Section 2, Township 43 North, Range 11 East. The project area consists of wetlands, woodlands, and open fields. The project site is not in active agricultural use.

Existing Maps

The United States Geological Survey (USGS) topographic map does not indicate a blue line stream, wetlands, or open water within the project limits (Exhibit 2). The National Wetland Inventory map indicates mapped wetlands along the southern portion of the project limits which is classified as Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded (PFO1C) (Exhibit 3). The Lake County Wetland Inventory map indicates the presence of several wetlands in the project limits (Exhibit 4). One of the wetlands mapped along the southern portion of the project site is identified as Advanced Identification (ADID). ADID wetlands are considered High Quality Aquatic Resources (HQAR) for permitting purposes. The Flood Insurance Rate Map does not indicate a mapped flood hazard (0.2% annual chance flood) within the project limits (Exhibit 5). The USGS Hydrologic Atlas does not provide evidence of a hydrologic connection to the Des Plaines River, a Waters of the U. S. (Exhibit 6). The Natural Resources Conservation Service's Lake County Soil Survey (Exhibit 7) indicates two mapped hydric soil within the project limits: Pella silty clay loam-153A and Montgomery silty clay loam-465A.

Wetland Delineation Methods

Wetlands on the project area were delineated on September 15, 21, and 29, 2022 by Steven Rauch (Lake County Certified Wetland Specialist-052) and Will Overbeck of Hey and Associates, Inc. using procedures outlined in the 1987 U. S. Army Corps of Engineers' (USACE) Wetland Delineation Manual and the 2010 Regional Supplement: Midwest Region. The entire project area was inspected, with areas supporting wetland plant species prioritized for investigation. If inspection revealed that wetland plant species comprised more than 50

Grainger Woods Wetland Delineation Report

percent of the plant cover, the suspected wetland was further examined for field indicators of hydric soil and hydrology. The USACE-accepted field indicators of hydric soil include: gleyed and low chroma matrix and mottle colors, and iron and manganese concretions. Necessary hydric soil indicators were field verified in the wetland areas. The USACE-approved field indicators of hydrology include: visual observation or photographic evidence of soil inundation or saturation during the growing season, oxidized channels associated with living roots and rhizomes, water marks, drift lines, waterborne sediment deposits, water stained leaves, surface scoured areas and drainage patterns. Wetland hydrologic criteria were met in the areas delineated as wetland.

A list of observed plant species in the wetland areas was compiled and data were gathered to complete USACE jurisdictional data forms. A native vegetative quality rating was calculated for each wetland using the Floristic Quality Assessment (FQA) system as originally published in Swink and Wilhelm's *Plants of the Chicago Region,* 1994, and updated in Wilhelm and Rericha's *Flora of the Chicago Region*, 2017. The FQA method assigns to plant species a rating that reflects the fundamental conservatism that the species exhibits for natural habitats. A native species that exhibits specific adaptations to a narrow spectrum of the environment is given a high rating. Conversely, a ubiquitous species that exhibits adaptations to a broad spectrum of environmental variables is given a low rating. Utilizing this method, a Floristic Quality Index (FQI) is derived for a given area. The FQI is an indication of native vegetative quality for an area: generally, 1-19 indicates low vegetative quality, 20-35 indicates high vegetative quality and above 35 indicates "Natural Area" quality.

The site does not contain any row crop agricultural fields, therefore a farmed wetland determination is not included in this report.

Results

Two wetland (Wetlands 1 and 2) totaling 20.06-acre on-site and a roadside ditch were delineated within the project limits. The wetland boundaries are shown on an aerial photograph in Exhibit 8 as surveyed in September 2022. Lists of the observed plant species

Grainger Woods Wetland Delineation Report

for the wetland areas are given in Exhibit 9. The USACE's jurisdictional data forms for upland and wetland areas are included as Exhibit 10. Representative color photographs of the upland and wetland areas are provided in Exhibit 11. Following is Table 1 that summarizes the delineated wetlands:

Table 1: Wetlands Summary

Wetland	Area (acres)	FQI[1]	Native Mean C[2]	HQAR[3]	Wetland Type	Dominant Vegetation
1	19.94	53.71	4.37	Yes	forested/wet meadow	swamp white oak *(Quercus bicolor)* buttonbush *(Cephalanthus occidentalis)* lake sedge *(Carex lacustris)*
2	0.12	14.62	3.19	No	wet meadow	flat top goldenrod *(Euthamia graminifolia)* red top *(Agrostis gigantea)* Dudley's rush *(Juncus dudleyi)*

1 The Floristic Quality Index (FQI) is an indication of native vegetative quality for an area: generally 1-19 indicates low vegetative quality, 20-35 indicates high vegetative quality and above 35 indicates "Natural Area" quality.
2 The Native Mean C is an indication of native vegetative quality for an area. Areas with value of 3.5 or greater are considered high quality.
3 Lake County Watershed Development Ordinance adopted October 13, 2020, Appendix L: High-Quality Aquatic Resources

Wetland 1 is a forested/wet meadow system that continues to the south beyond the project limits. The wetland has moderate functional value for stormwater detention and low functional value for nutrient removal, sediment/toxicant retention and is of high vegetative quality based on the FQA.

Wetland 2 is a wet meadow located in the northeast corner of the project that continues to the east beyond the project limits. The wetland has low functional value for stormwater detention and low functional value for nutrient removal, sediment/toxicant retention and is of moderate vegetative quality based on the FQA.

Roadside Ditch 1 was delineated in the ROW of St. Mary's Road.

Summary and Conclusions

The wetland investigation of the project site resulted in two wetlands and a roadside ditch being delineated. Lake County Stormwater Management Commission's (LCSMC) Preliminary Jurisdictional Determination letter dated October 3, 2022 is provided in Appendix A. The

Grainger Woods Wetland Delineation Report

letter states that Wetland 1 is under the jurisdiction of the USACE, Wetland 2 is under the jurisdiction of LCSMC, and that the Roadside Ditch is a non-regulated feature.

Wetlands cannot be filled or otherwise impacted without permit authorization. Generally, permanent impacts under 0.10-acre do not require mitigation of wetland losses. Any impacts over this acreage threshold will require mitigation at a minimum of 1.5:1. No work which would result in wetland impacts or wetland buffer impacts should be undertaken unless project authorization is first obtained.

Grainger Woods Wetland Delineation Report

References:

Swink, F. and G. Wilhelm. 1994. Plants of the Chicago Region. Indiana Academy of Science, Indianapolis, Indiana.

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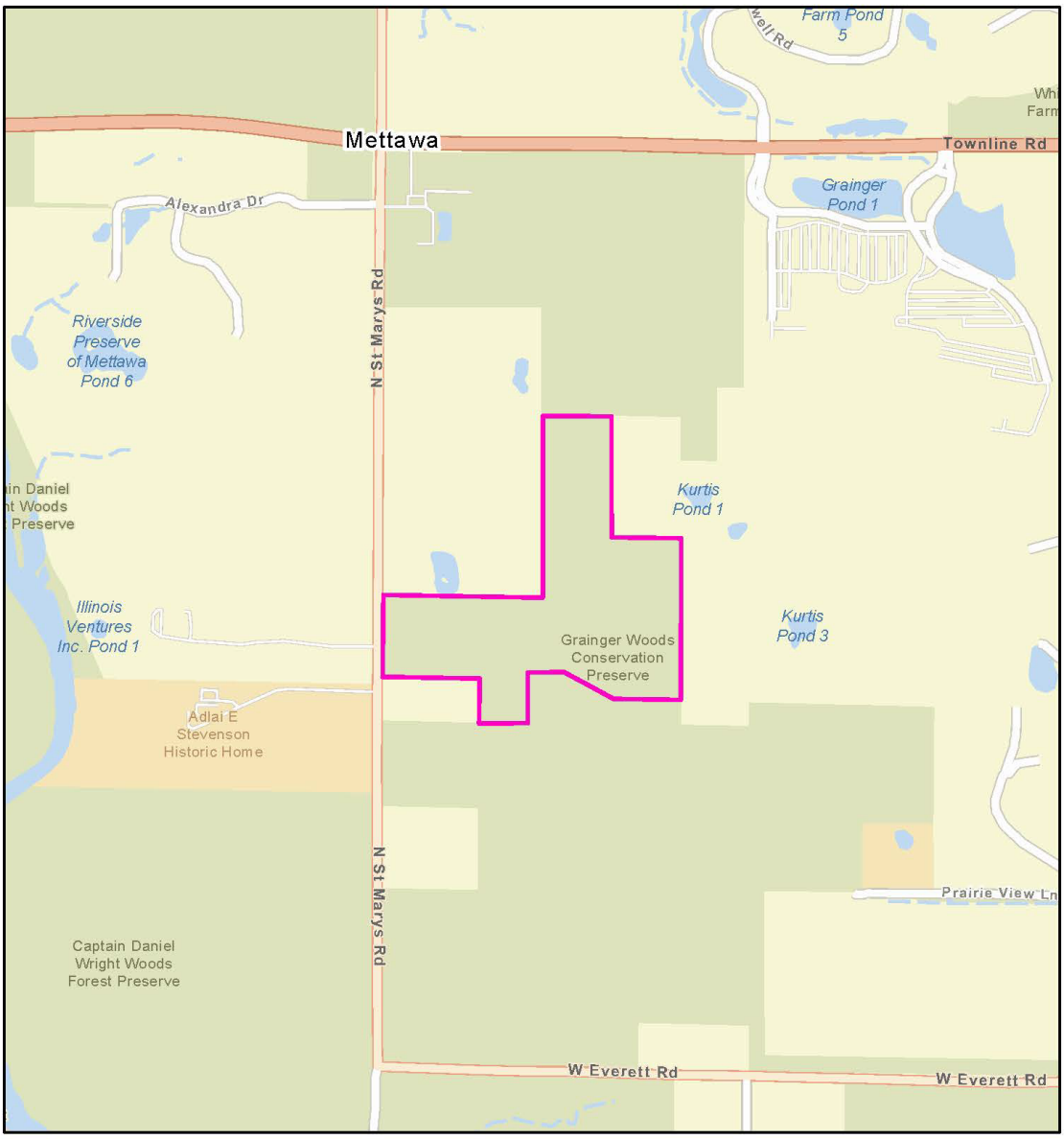
United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

Wilhelm, G. and L. Rericha. 2017. Flora of the Chicago Region: A Floristic and Ecological Synthesis. Indiana Academy of Science, Indianapolis.



0 1000 Feet

N
W E
S

Legend:
Project Boundary

Project Number: 22-0235

Date: 9/7/2022

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

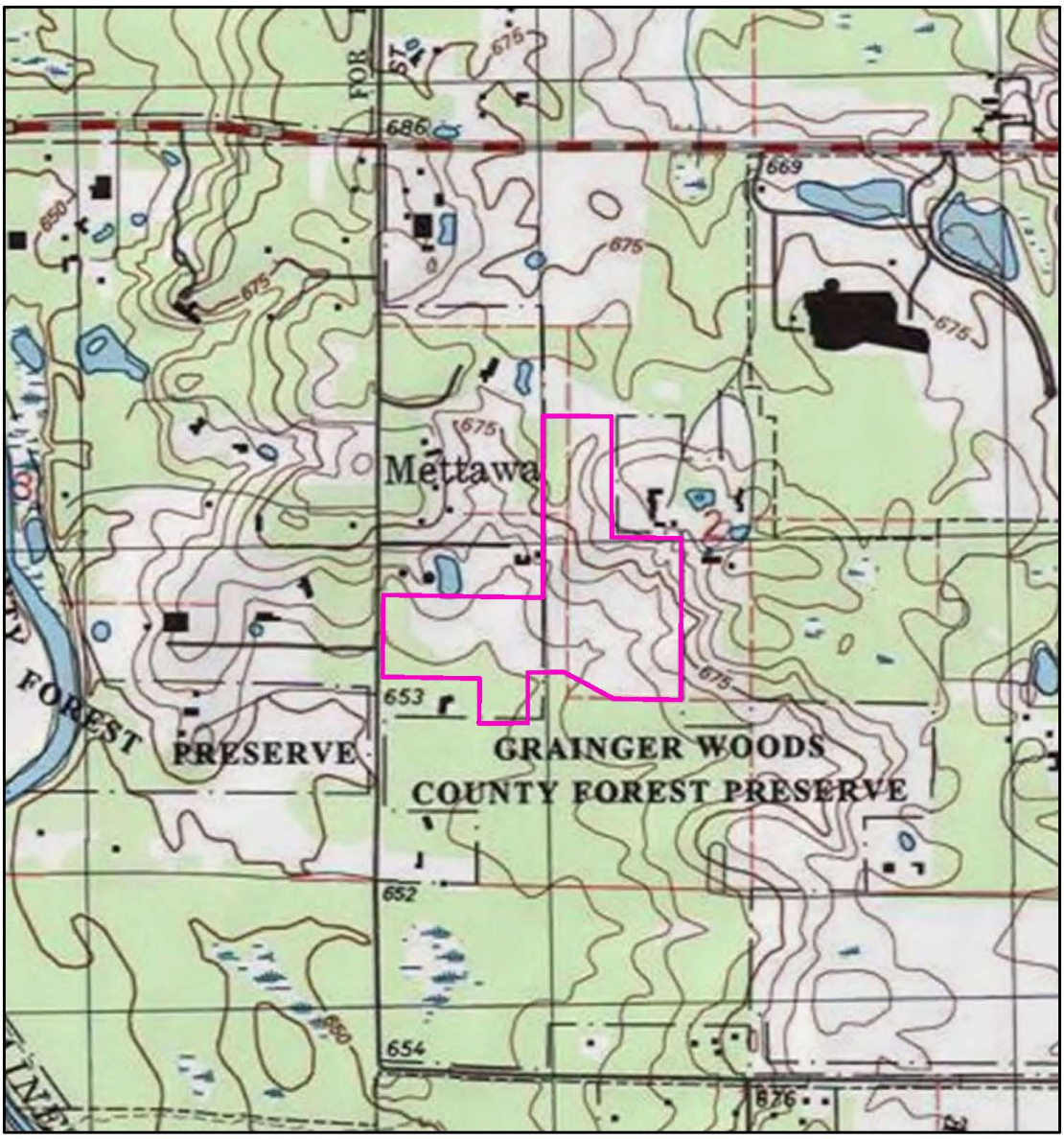
Project Name:
Grainger Woods

Prepared for:
Lake County Forest Preserves

Location Information:
T43N. R11E, Section 2

Exhibit Title:
Project Location

Exhibit:
1



0 1000 Feet

N
W E
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Legend:
Project Boundary

Project Name:
Grainger Woods

Project Number:22-0235

Prepared for:
Lake County Forest Preserves

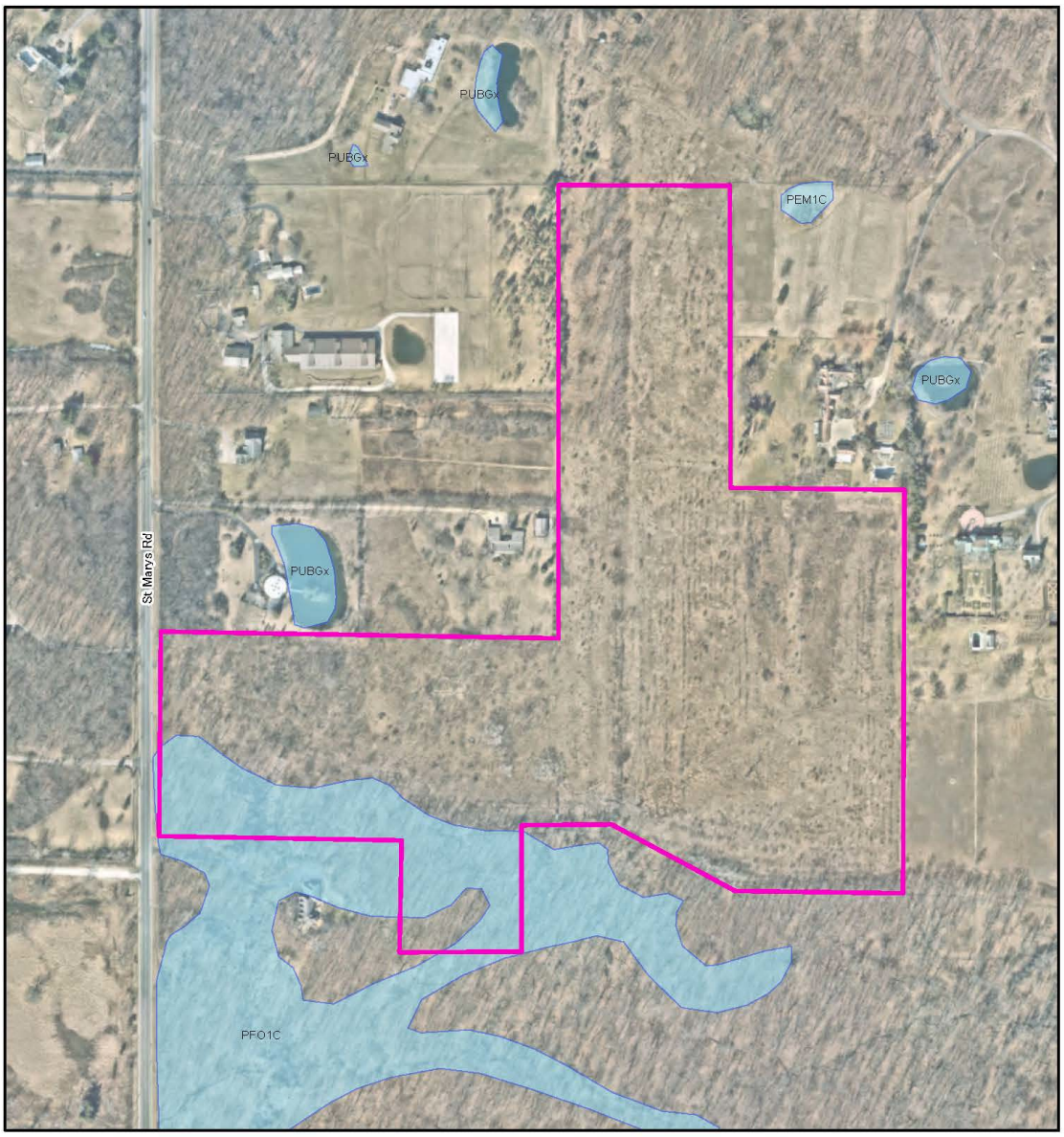
Date: 9/7/2022

Location Information:
Wheeling

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
USGS Topographic Map

Exhibit:
2



0 400 Feet

N
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Legend:
Project Boundary
National Wetland Inventory

Project Number:22-0235

Date: 9/7/2022

Project Name:
Grainger Woods

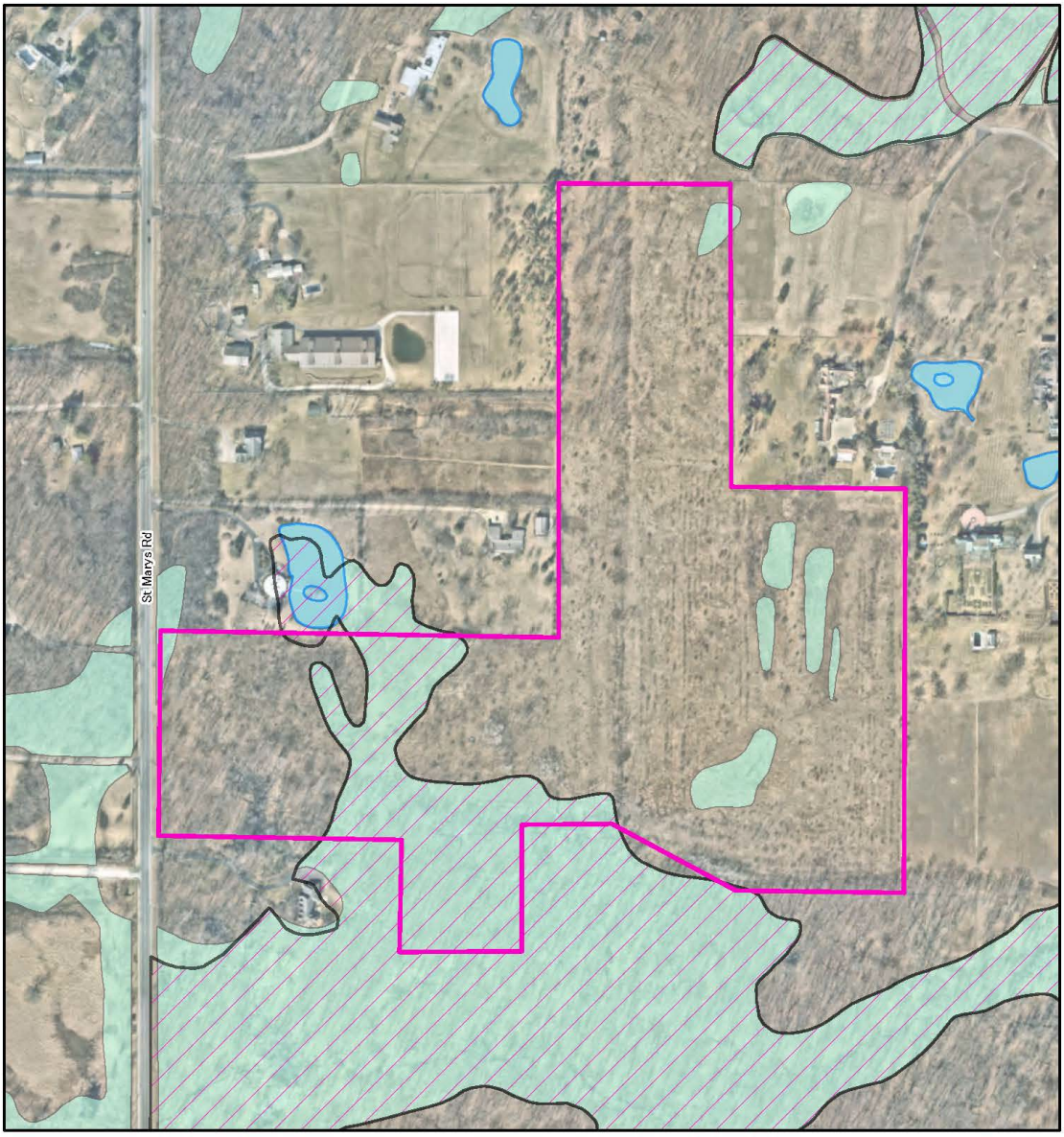
Prepared for:
Lake County Forest Preserves

Location Information:
Wheeling

Exhibit Title:
National Wetland Inventory

Exhibit:
3

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture



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Legend:
- Project Boundary
- Rivers and Streams
- Lakes and Ponds
- ADID Wetlands (1992)
- LCWI

Project Number:22-0235

Date: 9/7/2022

Project Name:
Grainger Woods

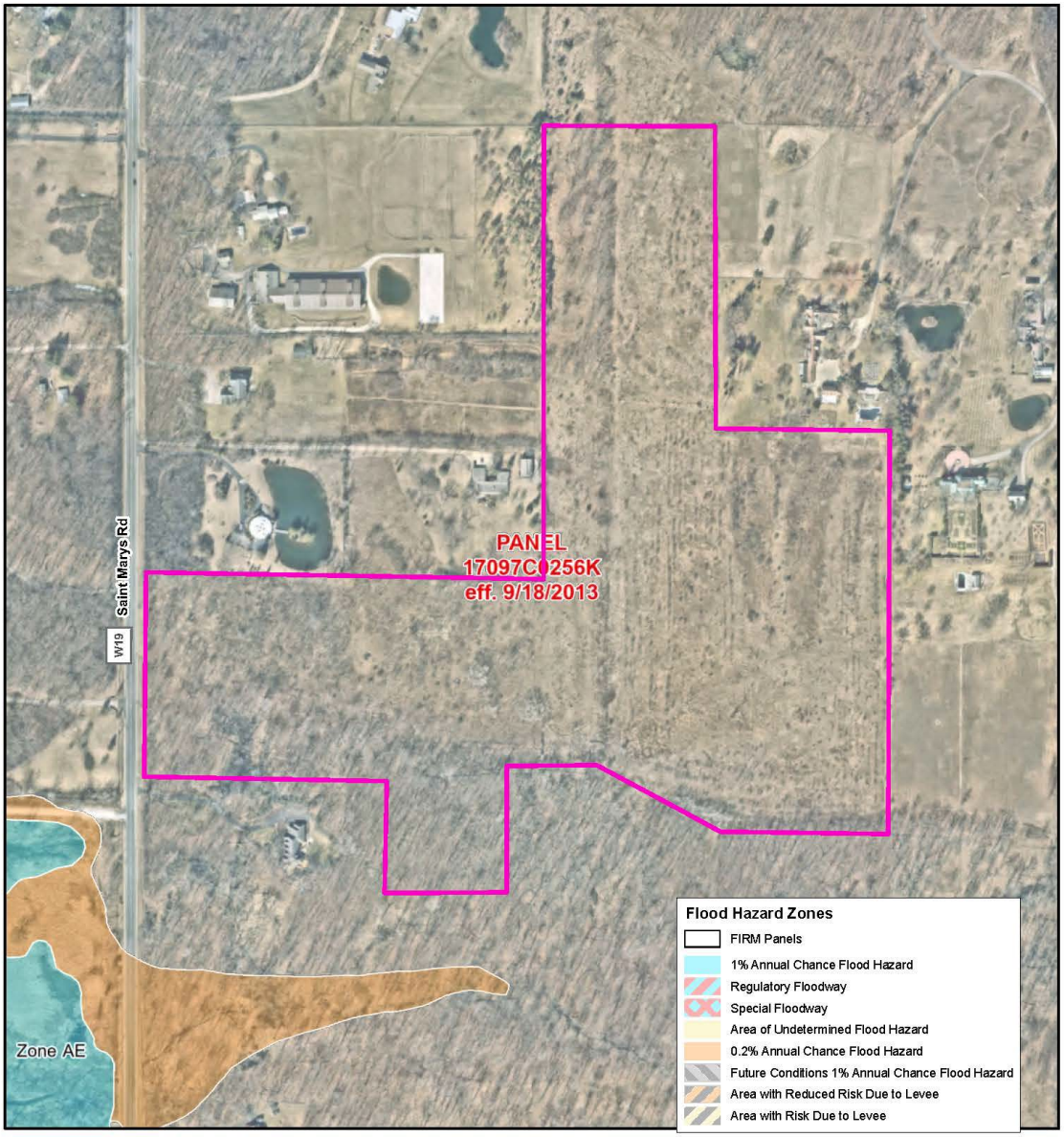
Prepared for:
Lake County Forest Preserves

Location Information:
Vernon Township

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
Lake County Wetland Inventory

Exhibit:
4



0 400 Feet

N
W E
S

Legend:
Project Boundary

Project Number:22-0235

Date: 9/7/2022

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

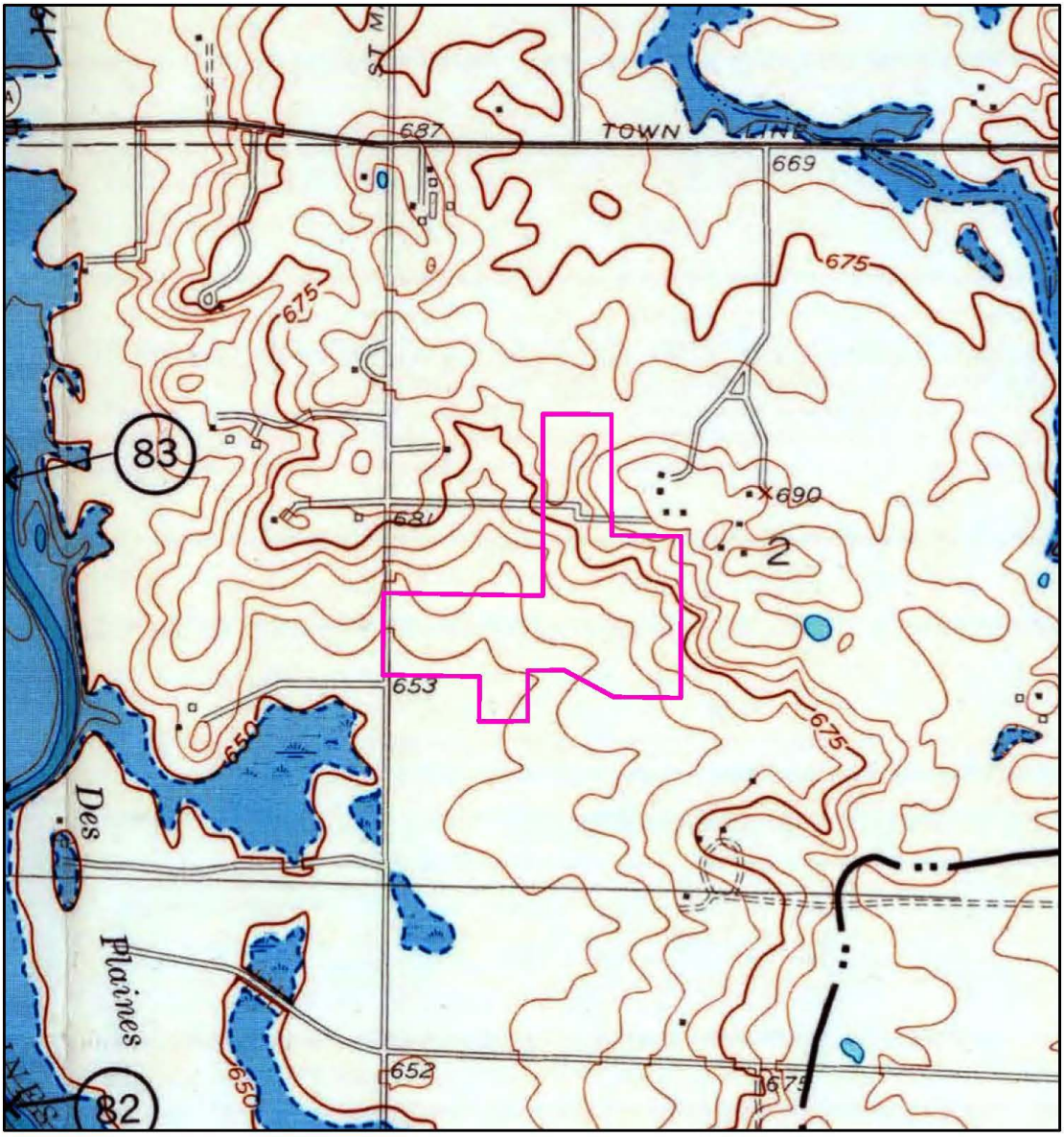
Project Name:
Grainger Woods

Prepared for:
Lake County Forest Preserves

Effective Date:
09/18/2013

Exhibit Title:
FEMA Flood Hazard Zones

Exhibit:
5



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W E
S

Legend:
Project Boundary

Project Name:
Grainger Woods

Project Number: 22-0235

Prepared for:
Lake County Forest Preserves

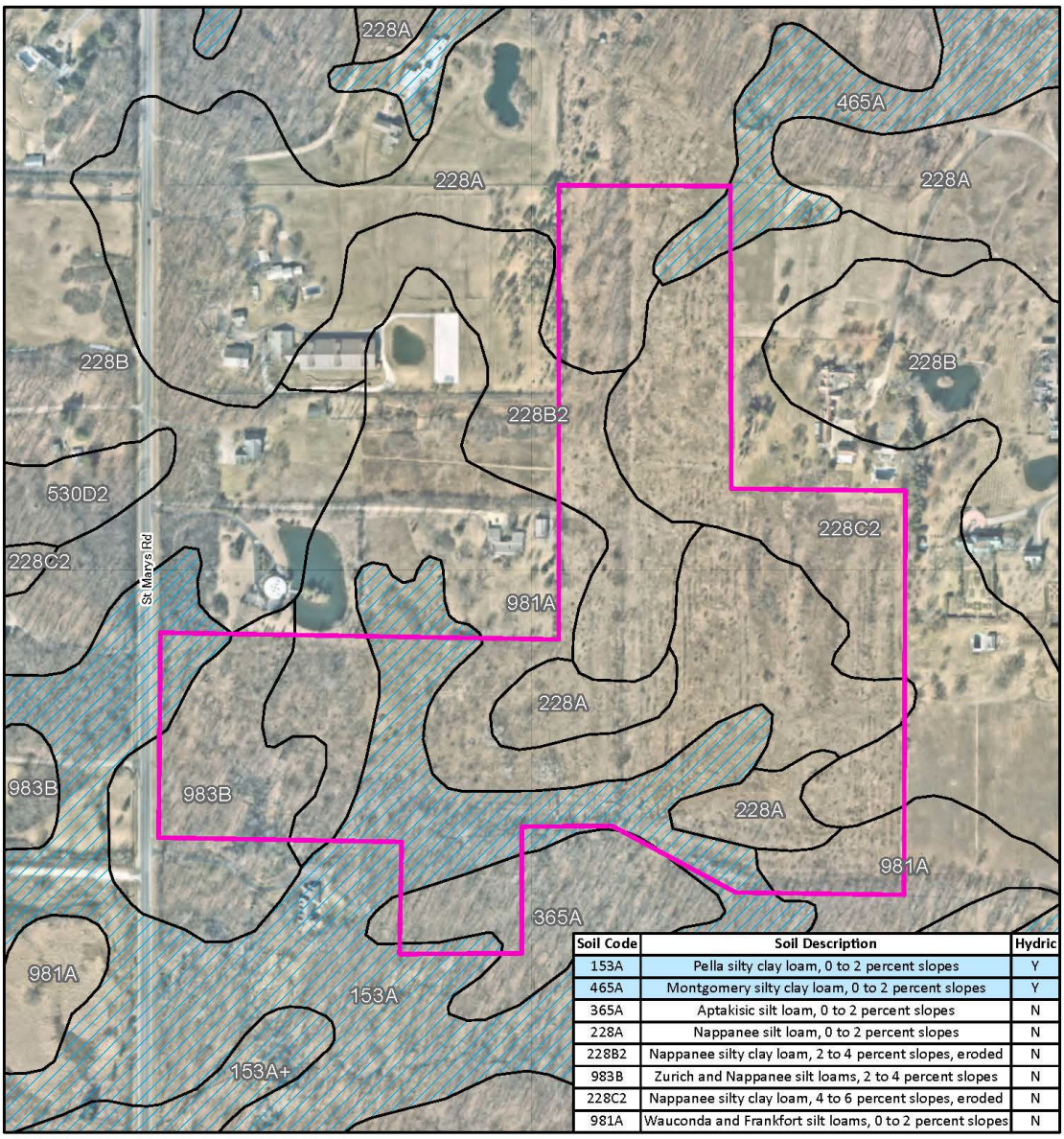
Date: 9/7/2022

Hydrologic Atlas Date:
1964

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
USGS Hydrologic Atlas

Exhibit:
6



Soil Code	Soil Description	Hydric
153A	Pella silty clay loam, 0 to 2 percent slopes	Y
465A	Montgomery silty clay loam, 0 to 2 percent slopes	Y
365A	Aptakisic silt loam, 0 to 2 percent slopes	N
228A	Nappanee silt loam, 0 to 2 percent slopes	N
228B2	Nappanee silty clay loam, 2 to 4 percent slopes, eroded	N
983B	Zurich and Nappanee silt loams, 2 to 4 percent slopes	N
228C2	Nappanee silty clay loam, 4 to 6 percent slopes, eroded	N
981A	Wauconda and Frankfort silt loams, 0 to 2 percent slopes	N

0 400 Feet

N W E S

Legend:
- Project Boundary
- Soils Units_og
- Hydric Soils

Project Number:22-0235

Date: 9/8/2022

Project Name:
Grainger Woods

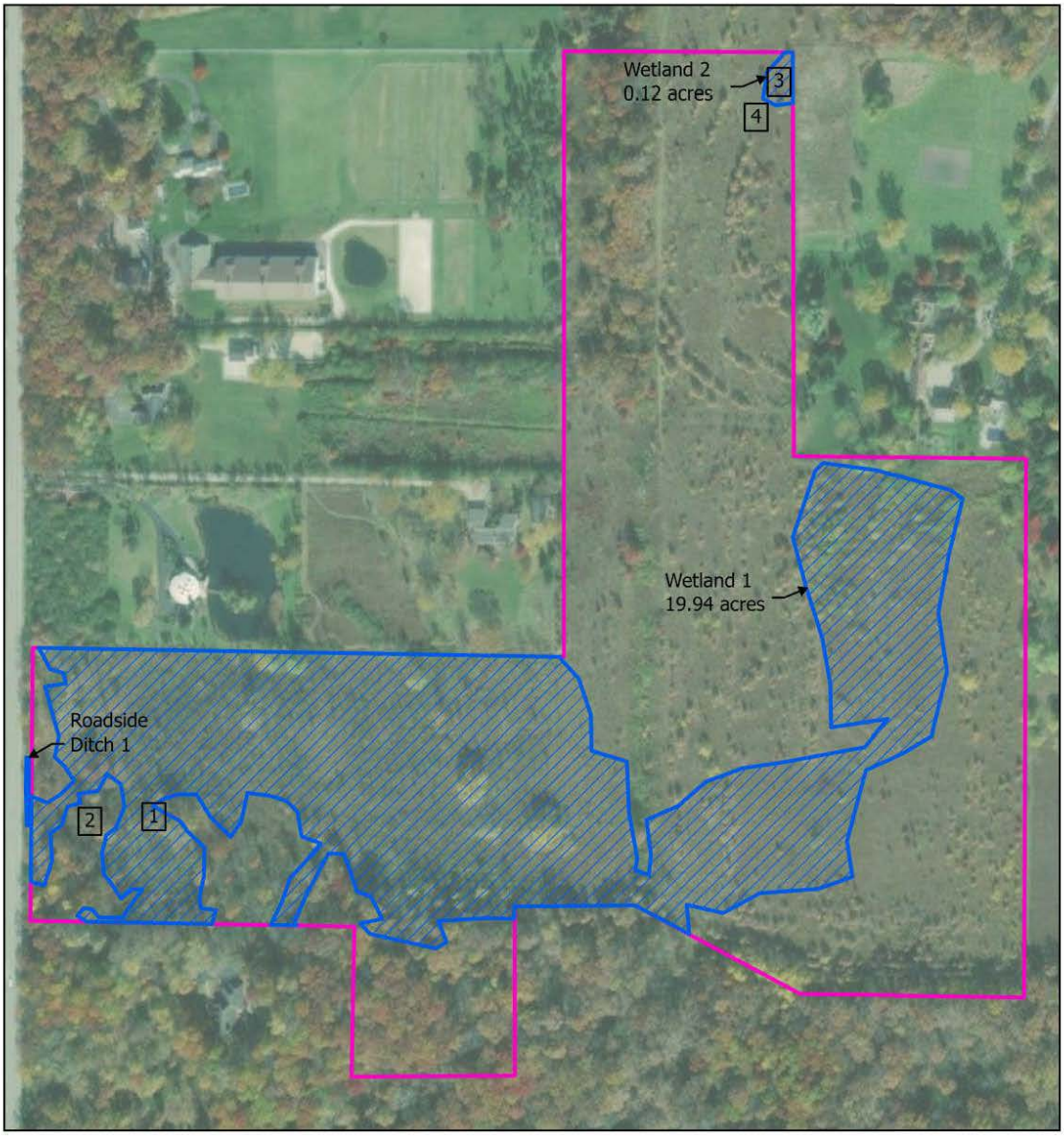
Prepared for:
Lake County Forest Preserves

Soil Survey Date:
2019

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
NRCS Lake County Soil Survey

Exhibit:
7



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Legend:
Project Boundary
Surveyed Wetland Boundary
X Data Points

Project Number: 22-0235

Date: 4/5/2023

Project Name:
Grainger Woods

Prepared for:
Lake County Forest Preserves

Aerial Date:
2020

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
Wetland Boundary

Exhibit:
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The following inventory, prepared by Hey and Associates, Inc., was prepared using the U.S. Army Corps of Engineers Chicago FQA Calculator Version 11, November 2017. It is cited as Herman, B., Sliwinski, R. and S. Whitaker. 2017. Chicago Region FQA (Floristic Quality Assessment) Calculator. U.S. Army Corps of Engineers, Chicago, IL.

The column labeled 'Species Name (NWPL/Mohlenbrock/Wilhelm & Rericha)' follows the taxonomical nomenclature of the National Wetland Plant List (Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.), and Mohlenbrock, R. 2014. Vascular Flora of Illinois: A Field Guide, Fourth Edition. Southern Illinois University Press. Species not found in the NWPL and Vascular Flora of Illinois follow the taxonomical nomenclature of Flora of the Chicago Region: A Floristic and Ecological Synthesis. Gerould Wilhelm & Laura Rericha. 2017. Indiana Academy of Science. Indianapolis, IN.

The column labeled 'Species(Synonym)' follows the taxonomical nomenclature of Swink, F. and Wilhelm, G. 1994. Plants of the Chicago Region, 4th Ed. The Indiana Academy of Science, Morton Arboretum, Lisle, IL and Flora of the Chicago Region: A Floristic and Ecological Synthesis. Gerould Wilhelm & Laura Rericha. 2017. Indiana Academy of Science. Indianapolis, IN.

The column labeled 'Common Name' follows the common name lexicon of the National Wetland Plant List (Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.) and Mohlenbrock, R. 2014. Vascular Flora of Illinois: A Field Guide, Fourth Edition. Southern Illinois University Press. For some species, Hey has substituted a more locally recognized common name.

The columns labeled 'Habit', 'Duration' and 'Nativity' follow information provided in the National Wetland Plant List (Lichvar, R. W. 2013. The National Wetland Plant List 2013 wetland ratings. Phytoneuron 2013-46:1-241; Kartesz, J.T. 2013. Floristic Synthesis of North America, Version 1.0 Biota of North America Program (BONAP). (in press)) and Swink, F. and Wilhelm, G. 1994. Plants of the Chicago Region, 4th Ed. The Indiana Academy of Science, Morton Arboretum, Lisle, IL.

In the tables provided here, each species is provided with its database acronym, its coefficient of conservatism (C value)(0 = weedy, 10 = conservative), its wetness coefficient (-2 = wet, +2 = dry), the corresponding National Wetland Category (OBL = obligate wetland species, FACW = facultative wetland, FAC - facultative species, FACU = facultative upland, UPL = upland species), and physiognomy (A = annual, B = biennial, P = perennial, W = woody, H = herbaceous), the plant habit (grass, forb, sedge, etc.), duration (annual, perennial, biennial), and nativity. Adventives include those species that have entered the region since European settlement and are therefore not integral to any pre-settlement community.

The information above the species list provides analysis of the vegetative quality of the site. It shows the total number of species present (species richness), the mean coefficient of conservatism (Mean C), the index (FQAI), and mean wetness; calculated separately for native species only and including the adventive species. The Mean C datum indicates the average coefficient of conservatism. The FQAI is derived by multiplying the Mean C by the square root of the number of species. If the FQAI of an area registers in the middle 30s or higher, one can be relatively certain that there is sufficient native character to be of rather profound environmental importance in terms of a regional natural area prospective. The wetness datum indicates the mean wetness coefficient for all species present, natives only and then with adventives. The table also provides the number of species in each physiognomic class, native versus adventive along with their percentage of the total inventory.

SITE: Wetland 1
LOCALE: Grainger Woods, Lake County, IL
BY: Will Overbeck
NOTES: 9/29/2022

CONSERVATISM-BASED METRICS		ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	**4.37**	SPECIES RICHNESS (ALL)	182
MEAN C (ALL SPECIES)	3.63	SPECIES RICHNESS (NATIVE)	151
MEAN C (NATIVE TREES)	4.47	% NON-NATIVE	0.17
MEAN C (NATIVE SHRUBS)	4.75	WET INDICATOR (ALL)	-0.36
MEAN C (NATIVE HERBACEOUS)	4.36	WET INDICATOR (NATIVE)	-0.52
FQAI (NATIVE SPECIES)	**53.71**	% HYDROPHYTE (MIDWEST)	0.70
FQAI (ALL SPECIES)	48.92	% NATIVE PERENNIAL	0.77
ADJUSTED FQAI	39.81	% NATIVE ANNUAL	0.05
% C VALUE 0	0.22	% ANNUAL	0.05
% C VALUE 1-3	0.22	% PERENNIAL	0.92
% C VALUE 4-6	0.41		
% C VALUE 7-10	0.15		

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
acesai	Acer saccharinum	Acer saccharinum	Silver Maple	1	FACW	-1	Tree	Perennial	Native
acesau	Acer saccharum	Acer saccharum	Sugar Maple	5	FACU	1	Tree	Perennial	Native
agealt	Ageratina altissima	Eupatorium rugosum	White Snakeroot	3	FACU	1	Forb	Perennial	Native
agrgry	Agrimonia gryposepala	Agrimonia gryposepala	Tall Hairy Grooveburr	2	FACU	1	Forb	Perennial	Native
agralb	Agrostis gigantea	AGROSTIS ALBA	Black Bent	0	FACW	-1	Grass	Perennial	Adventive
ambart	Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	1	Forb	Annual	Native
ampbra	Amphicarpaea bracteata	Amphicarpaea bracteata	American Hog-Peanut	5	FAC	0	Vine	Annual	Native
andger	Andropogon gerardii	Andropogon gerardii	Big Bluestem	5	FAC	0	Grass	Perennial	Native
anevir	Anemone virginiana	Anemone virginiana	Tall Thimbleweed	5	FACU	1	Forb	Perennial	Native
apocan	Apocynum cannabinum	Apocynum sibiricum	Indian-Hemp	2	FAC	0	Forb	Perennial	Native
aridra	Arisaema dracontium	Arisaema dracontium	Greendragon	6	FACW	-1	Forb	Perennial	Native
aritri	Arisaema triphyllum	Arisaema triphyllum ssp. Pusillum	Jack-In-The-Pulpit	5	FACW	-1	Forb	Perennial	Native
ascinc	Asclepias incarnata	Asclepias incarnata	Swamp Milkweed	3	OBL	-2	Forb	Perennial	Native
bidfro	Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
boecyl	Boehmeria cylindrica	Boehmeria cylindrica drummondiana	Small-Spike False Nettle	5	OBL	-2	Forb	Perennial	Native
bolast	Boltonia asteroides	Boltonia latisquama recognita	White Doll's Daisy	8	OBL	-2	Forb	Perennial	Native
calcan	Calamagrostis canadensis	Calamagrostis canadensis	Bluejoint	6	OBL	-2	Grass	Perennial	Native

cxblan	Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	0	Sedge	Perennial	Native
cxbrom	Carex bromoides	Carex bromoides	Brome-Like Sedge	10	FACW	-1	Sedge	Perennial	Native
cxgral	Carex gracillima	Carex gracillima	Graceful Sedge	7	FACU	1	Sedge	Perennial	Native
cxgran	Carex granularis	Carex granularis	Limestone-Meadow Sedge	3	FACW	-1	Sedge	Perennial	Native
cxlacu	Carex lacustris	Carex lacustris	Lakebank Sedge	5	OBL	-2	Sedge	Perennial	Native
cxlupn	Carex lupulina	Carex lupulina	Hop Sedge	6	OBL	-2	Sedge	Perennial	Native
cxmole	Carex molesta	Carex molesta	Troublesome Sedge	2	FAC	0	Sedge	Perennial	Native
cxstip	Carex stipata	Carex stipata	Stalk-Grain Sedge	4	OBL	-2	Sedge	Perennial	Native
cxstri	Carex stricta	Carex stricta	Uptight Sedge	5	OBL	-2	Sedge	Perennial	Native
cxtrib	Carex tribuloides	Carex tribuloides	Blunt Broom Sedge	7	OBL	-2	Sedge	Perennial	Native
cxvulp	Carex vulpinoidea	Carex vulpinoidea	Common Fox Sedge	2	FACW	-1	Sedge	Perennial	Native
carcor	Carya cordiformis	Carya cordiformis	Bitter-Nut Hickory	5	FACU	1	Tree	Perennial	Native
carlac	Carya laciniosa	Carya laciniosa	Shell-Bark Hickory	9	FACW	-1	Tree	Perennial	Native
carovt	Carya ovata	Carya ovata	Shag-Bark Hickory	5	FACU	1	Tree	Perennial	Native
catspe	Catalpa speciosa	CATALPA SPECIOSA	Northern Catalpa	0	FACU	1	Tree	Perennial	Adventive
cepocc	Cephalanthus occidentalis	Cephalanthus occidentalis	Common Buttonbush	5	OBL	-2	Shrub	Perennial	Native
chegla	Chelone glabra	Chelone glabra	White Turtlehead	8	OBL	-2	Forb	Perennial	Native
cicmac	Cicuta maculata	Cicuta maculata	Spotted Water-Hemlock	6	OBL	-2	Forb	Perennial	Native
cinaru	Cinna arundinacea	Cinna arundinacea	Sweet Wood-Reed	5	FACW	-1	Grass	Perennial	Native
cirarv	Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
cortri	Coreopsis tripteris	Coreopsis tripteris	Tall Tickseed	5	FAC	0	Forb	Perennial	Native
coralb	Cornus alba	Cornus stolonifera	Red Osier	5	FACW	-1	Shrub	Perennial	Native
corobl	Cornus obliqua	Cornus obliqua	Pale Dogwood	5	FACW	-1	Shrub	Perennial	Native
corrac	Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	0	Shrub	Perennial	Native
corame	Corylus americana	Corylus americana	American Hazelnut	5	FACU	1	Shrub	Perennial	Native
cracru	Crataegus crus-galli	Crataegus crus-galli; Crataegus acutifolia	Cock-Spur Hawthorn	3	FAC	0	Tree	Perennial	Native
cracoc	Crataegus pedicellata	Crataegus coccinea	Scarlet Hawthorn	5	UPL	2	Tree	Perennial	Native
cypstr	Cyperus strigosus	Cyperus strigosus	Straw-Color Flat Sedge	1	FACW	-1	Sedge	Perennial	Native
daucar	Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
descaa	Desmodium canadense	Desmodium canadense	Showy Tick-Trefoil	4	FACU	1	Forb	Perennial	Native
dicacu	Dichanthelium acuminatum	Panicum implicatum; Panicum auburne	Tapered Rosette Grass	4	FAC	0	Grass	Perennial	Native
diplac	Dipsacus laciniatus	DIPSACUS LACINIATUS	Cut-Leaf Teasel	0	UPL	2	Forb	Biennial	Adventive
echmur	Echinochloa muricata	Echinochloa muricata	Rough Barnyard Grass	4	OBL	-2	Grass	Annual	Native
elyhys	Elymus hystrix	Hystrix patula	Eastern Bottle-Brush Grass	5	FACU	1	Grass	Perennial	Native
elyvir	Elymus virginicus	Elymus virginicus	Virginia Wild Rye	3	FACW	-1	Grass	Perennial	Native
epicol	Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
equhye	Equisetum hyemale	Equisetum hyemale	Tall Scouring-Rush	1	FACW	-1	Fern	Perennial	Native
eriphi	Erigeron philadelphicus	Erigeron philadelphicus	Philadelphia Fleabane	4	FACW	-1	Forb	Perennial	Native
eupalt	Eupatorium altissimum	Eupatorium altissimum	Tall Boneset	0	UPL	2	Forb	Perennial	Native

eupper	Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	-2	Forb	Perennial	Native
solgra	Euthamia graminifolia	Solidago graminifolia	Flat-Top Goldentop	4	FACW	-1	Forb	Perennial	Native
euppur	Eutrochium purpureum	Eupatorium purpureum	Sweet-Scented Joe-Pye-Weed	6	FAC	0	Forb	Perennial	Native
fravir	Fragaria virginiana	Fragaria virginiana	Virginia Strawberry	0	FACU	1	Forb	Perennial	Native
fraaln	Frangula alnus	RHAMNUS FRANGULA	Glossy False Buckthorn	0	FACW	-1	Shrub	Perennial	Adventive
franig	Fraxinus nigra	Fraxinus nigra	Black Ash	8	FACW	-1	Tree	Perennial	Native
frapen	Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	4	FACW	-1	Tree	Perennial	Native
gallab	Galium labradoricum	Galium labradoricum	Northern Bog Bedstraw	10	OBL	-2	Forb	Perennial	Native
galtrl	Galium triflorum	Galium triflorum	Fragrant Bedstraw	5	FACU	1	Forb	Perennial	Native
genand	Gentiana andrewsii	Gentiana andrewsii	Closed Bottle Gentian	9	FACW	-1	Forb	Perennial	Native
germac	Geranium maculatum	Geranium maculatum	Spotted Crane's-Bill	5	FACU	1	Forb	Perennial	Native
geuale	Geum aleppicum	Geum aleppicum strictum	Yellow Avens	3	FACW	-1	Forb	Perennial	Native
geucan	Geum canadense	Geum canadense	White Avens	1	FAC	0	Forb	Perennial	Native
glystr	Glyceria striata	Glyceria striata var. stricta	Fowl Manna Grass	4	OBL	-2	Grass	Perennial	Native
helaut	Helenium autumnale	Helenium autumnale var. canaliculatum	Fall Sneezeweed	5	FACW	-1	Forb	Perennial	Native
helgro	Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	4	FACW	-1	Forb	Perennial	Native
hydvir	Hydrophyllum virginianum	Hydrophyllum virginianum	Shawnee-Salad	5	FAC	0	Forb	Perennial	Native
hyppun	Hypericum punctatum	Hypericum punctatum	Spotted St. John's-Wort	4	FAC	0	Forb	Perennial	Native
ilever	Ilex verticillata	Ilex verticillata	Common Winterberry	10	FACW	-1	Shrub	Perennial	Native
impcap	Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
irivir	Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	-2	Forb	Perennial	Native
junbrp	Juncus brachycephalus	Juncus brachycephalus	Small-Head Rush	10	OBL	-2	Forb	Perennial	Native
jundud	Juncus dudleyi	Juncus dudleyi	Dudley's Rush	2	FACW	-1	Forb	Perennial	Native
juneff	Juncus effusus ssp. solutus	Juncus effusus	Lamp Rush	5	OBL	-2	Forb	Perennial	Native
laccan	Lactuca canadensis	Lactuca canadensis	Canadian Blue Lettuce	1	FACU	1	Forb	Biennial	Native
leeory	Leersia oryzoides	Leersia oryzoides	Rice Cut Grass	3	OBL	-2	Grass	Perennial	Native
liaspi	Liatris spicata	Liatris spicata	Dense Gayfeather	7	FAC	0	Forb	Perennial	Native
ligvul	Ligustrum vulgare	LIGUSTRUM VULGARE	European Privet	0	FACU	1	Shrub	Perennial	Adventive
lilmic	Lilium michiganense	Lilium michiganense	Michigan Lily	8	FACW	-1	Forb	Perennial	Native
lobcar	Lobelia cardinalis	Lobelia cardinalis	Cardinal-Flower	7	OBL	-2	Forb	Perennial	Native
lobsip	Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	4	OBL	-2	Forb	Perennial	Native
lontat	Lonicera tatarica	LONICERA TATARICA	Twinsisters	0	FACU	1	Shrub	Perennial	Adventive
lycuni	Lycopus uniflorus	Lycopus uniflorus	Northern Water-Horehound	4	OBL	-2	Forb	Perennial	Native
lycvir	Lycopus virginicus	Lycopus virginicus	Virginia Water-Horehound	7	OBL	-2	Forb	Perennial	Native
lyscil	Lysimachia ciliata	Lysimachia ciliata	Fringed Yellow-Loosestrife	7	FACW	-1	Forb	Perennial	Native
lytsal	Lythrum salicaria	LYTHRUM SALICARIA	Purple Loosestrife	0	OBL	-2	Forb	Perennial	Adventive

smiste	Maianthemum stellatum	Smilacina stellata	Starry False Solomon's-Seal	5	FAC	0	Forb	Perennial	Native
malpum	Malus pumila	MALUS PUMILA	Apple	0	UPL	2	Tree	Perennial	Adventive
maltor	Malus toringa	MALUS SIEBOLDII	Japanese Crab Apple	0	UPL	2	Tree	Perennial	Adventive
melalb	Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	2	Forb	Biennial	Adventive
mimala	Mimulus alatus	Mimulus alatus	Sharp-Wing Monkey-Flower	9	OBL	-2	Forb	Perennial	Native
monfis	Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
muhmex	Muhlenbergia mexicana	Muhlenbergia mexicana	Mexican Muhly	5	FACW	-1	Grass	Perennial	Native
muhsch	Muhlenbergia schreberi	Muhlenbergia schreberi	Nimblewill	0	FAC	0	Grass	Perennial	Native
onosen	Onoclea sensibilis	Onoclea sensibilis	Sensitive Fern	5	FACW	-1	Fern	Perennial	Native
ostvir	Ostrya virginiana	Ostrya virginiana	Eastern Hop-Hornbeam	5	FACU	1	Tree	Perennial	Native
oxastr	Oxalis stricta	Oxalis europaea	Upright Yellow Wood-Sorrel	0	FACU	1	Forb	Perennial	Native
pacaur	Packera aurea	Senecio aureus	Golden Groundsel	8	FACW	-1	Forb	Perennial	Native
pedlan	Pedicularis lanceolata	Pedicularis lanceolata	Swamp Lousewort	10	OBL	-2	Forb	Perennial	Native
pendig	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	0	Forb	Perennial	Native
pensed	Penthorum sedoides	Penthorum sedoides	Ditch-Stonecrop	4	OBL	-2	Forb	Perennial	Native
polhyd	Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native
polper	Persicaria maculosa	POLYGONUM PERSICARIA	Lady's-Thumb	0	FACW	-1	Forb	Annual	Adventive
polvir	Persicaria virginiana	Polygonum virginianum	Jumpseed	4	FAC	0	Forb	Perennial	Native
phaaru	Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
phlpra	Phleum pratense	PHLEUM PRATENSE	Common Timothy	0	FACU	1	Grass	Perennial	Adventive
phrausu	Phragmites australis ssp. australis	PHRAGMITES AUSTRALIS	Common Reed	0	FACW	-1	Grass	Perennial	Adventive
phyopu	Physocarpus opulifolius	Physocarpus opulifolius	Atlantic Ninebark	5	FACW	-1	Shrub	Perennial	Native
poacom	Poa compressa	POA COMPRESSA	Flat-Stem Blue Grass	0	FACU	1	Grass	Perennial	Adventive
poapas	Poa palustris	Poa palustris	Fowl Blue Grass	7	FACW	-1	Grass	Perennial	Native
poapra	Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
polramr	Polygonum ramosissimum ssp. ramosissimum	Polygonum ramosissimum	Yellow-Flower Knotweed	1	FACU	1	Forb	Annual	Native
popdel	Populus deltoides	Populus deltoides	Eastern Cottonwood	0	FAC	0	Tree	Perennial	Native
poptre	Populus tremuloides	Populus tremuloides	Quaking Aspen	3	FAC	0	Tree	Perennial	Native
potsim	Potentilla simplex	Potentilla simplex argyrisma	Oldfield Cinquefoil	3	FACU	1	Forb	Perennial	Native
pruvuv	Prunella vulgaris ssp. vulgaris	PRUNELLA VULGARIS	Common Selfheal	0	FAC	0	Forb	Perennial	Adventive
pycten	Pycnanthemum tenuifolium	Pycnanthemum tenuifolium	Narrow-Leaf Mountain-Mint	7	FAC	0	Forb	Perennial	Native
pycvir	Pycnanthemum virginianum	Pycnanthemum virginianum	Virginia Mountain-Mint	5	FACW	-1	Forb	Perennial	Native
pyrcal	Pyrus calleryana	PYRUS CALLERYANA	Ornamental Pear	0	UPL	2	Tree	Perennial	Adventive
quealb	Quercus alba	Quercus alba	Northern White Oak	5	FACU	1	Tree	Perennial	Native
quebic	Quercus bicolor	Quercus bicolor	Swamp White Oak	5	FACW	-1	Tree	Perennial	Native
queell	Quercus ellipsoidalis	Quercus ellipsoidalis	Hill's Oak	4	UPL	2	Tree	Perennial	Native
quemac	Quercus macrocarpa	Quercus macrocarpa	Burr Oak	5	FAC	0	Tree	Perennial	Native
querub	Quercus rubra	Quercus rubra	Northern Red Oak	5	FACU	1	Tree	Perennial	Native

ranfla	Ranunculus flabellaris	Ranunculus flabellaris	Greater Yellow Water Buttercup	5	OBL	-2	Forb	Perennial	Native
ranhis	Ranunculus hispidus	Ranunculus hispidus	Bristly Buttercup	8	FAC	0	Forb	Perennial	Native
rhacat	Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
ribame	Ribes americanum	Ribes americanum	Wild Black Currant	4	FACW	-1	Shrub	Perennial	Native
rorpal	Rorippa palustris	0	Bog Yellowcress	4	OBL	-2	Forb	Perennial	Native
rosmul	Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	1	Shrub	Perennial	Adventive
rospal	Rosa palustris	Rosa palustris	Swamp Rose	8	OBL	-2	Shrub	Perennial	Native
rosset	Rosa setigera	Rosa setigera var. tomentosa	Climbing Rose	5	FACU	1	Shrub	Perennial	Native
rubida	Rubus idaeus ssp. idaeus	RUBUS IDAEUS	Common Red Raspberry	0	FACU	1	Shrub	Perennial	Adventive
rubocc	Rubus occidentalis	Rubus occidentalis	Black Raspberry	0	UPL	2	Shrub	Perennial	Native
rudhir	Rudbeckia hirta	Rudbeckia hirta var. pulcherrima	Black-Eyed-Susan	1	FACU	1	Forb	Perennial	Native
rudlac	Rudbeckia laciniata	Rudbeckia laciniata	Green-Head Coneflower	4	FACW	-1	Forb	Perennial	Native
rudsub	Rudbeckia subtomentosa	Rudbeckia subtomentosa	Sweet Coneflower	8	FACU	1	Forb	Perennial	Native
rudtri	Rudbeckia triloba	Rudbeckia triloba	Brown-Eyed-Susan	1	FACU	1	Forb	Annual	Native
salnig	Salix nigra	Salix nigra	Black Willow	5	OBL	-2	Tree	Perennial	Native
sanodo	Sanicula odorata	Sanicula gregaria	Clustered Black-Snakeroot	3	FAC	0	Forb	Perennial	Native
fesela	Schedonorus pratensis	FESTUCA ELATIOR	Meadow False Rye Grass	0	FACU	1	Grass	Perennial	Adventive
sciatv	Scirpus atrovirens	Scirpus atrovirens	Dark-Green Bulrush	4	OBL	-2	Sedge	Perennial	Native
scicyp	Scirpus cyperinus	Scirpus cyperinus	Cottongrass Bulrush	6	OBL	-2	Sedge	Perennial	Native
scipen	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2	OBL	-2	Sedge	Perennial	Native
sculat	Scutellaria lateriflora	Scutellaria lateriflora	Mad Dog Skullcap	4	OBL	-2	Forb	Perennial	Native
erehie	Senecio hieraciifolius	Erechtites hieracifolia	American Burnweed	0	FAC	0	Forb	Annual	Native
silter	Silphium terebinthinaceum	Silphium terebinthinaceum	Prairie Dock	5	FAC	0	Forb	Perennial	Native
siusua	Sium suave	Sium suave	Hemlock Water-Parsnip	7	OBL	-2	Forb	Perennial	Native
solalt	Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
solgig	Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
soljun	Solidago juncea	Solidago juncea	Early Goldenrod	3	UPL	2	Forb	Perennial	Native
solnem	Solidago nemoralis	Solidago nemoralis	Gray Goldenrod	3	UPL	2	Forb	Perennial	Native
solrig	Solidago rigida	Oligoneuron rigidum	Hard-Leaf Flat-Top-Goldenrod	3	FACU	1	Forb	Perennial	Native
sonarv	Sonchus arvensis	SONCHUS ARVENSIS	Field Sow-Thistle	0	FACU	1	Forb	Perennial	Adventive
sornut	Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5	FACU	1	Grass	Perennial	Native
stapal	Stachys palustris	0	Woundwort	0	OBL	-2	Forb	Perennial	Adventive
symdru	Symphyotrichum drummondii	Aster sagittifolius drummondii	Drummond's Aster	3	UPL	2	Forb	Perennial	Native
symlan	Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
symlat	Symphyotrichum lateriflorum	Aster lateriflorus	Farewell-Summer	4	FACW	-1	Forb	Perennial	Native
symnov	Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	3	FACW	-1	Forb	Perennial	Native
symont	Symphyotrichum ontarionis	Aster ontarionis	Ontario American-Aster	5	FAC	0	Forb	Perennial	Native
sympil	Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
sympra	Symphyotrichum praealtum	Aster praealtus	Willow-Leaf American-Aster	7	FACW	-1	Forb	Perennial	Native

taroff	Taraxacum officinale	TARAXACUM OFFICINALE	Common Dandelion	0	FACU	1	Forb	Perennial	Adventive
thadas	Thalictrum dasycarpum	Thalictrum dasycarpum hypoglaucum	Purple Meadow-Rue	6	FACW	-1	Forb	Perennial	Native
toxrad	Toxicodendron radicans	Rhus radicans	Eastern Poison-Ivy	2	FAC	0	Vine	Perennial	Native
trihyb	Trifolium hybridum	TRIFOLIUM HYBRIDUM	Alsike Clover	0	FACU	1	Forb	Perennial	Adventive
typang	Typha angustifolia	TYPHA ANGUSTIFOLIA	Narrow-Leaf Cat-Tail	0	OBL	-2	Forb	Perennial	Adventive
typlat	Typha latifolia	Typha latifolia	Broad-Leaf Cat-Tail	5	OBL	-2	Forb	Perennial	Native
ulmame	Ulmus americana	Ulmus americana	American Elm	3	FACW	-1	Tree	Perennial	Native
verhas	Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
vervir	Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	8	FAC	0	Forb	Perennial	Native
vibden	Viburnum dentatum	VIBURNUM DENTATUM VAR. SCABRELLUM	Southern Arrow-Wood	0	FAC	0	Shrub	Perennial	Adventive
viblen	Viburnum lentago	Viburnum lentago	Nanny-Berry	4	FAC	0	Shrub	Perennial	Native
vibopu	Viburnum opulus var. opulus	VIBURNUM OPULUS	Highbush-Cranberry	0	FAC	0	Shrub	Perennial	Adventive
vitrip	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native

SITE: Wetland 2
LOCALE: Grainger Woods, Lake County, IL
BY: Steven Rauch
DATE: 9/29/2022

CONSERVATISM-BASED METRICS		ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	**3.19**	SPECIES RICHNESS (ALL)	30
MEAN C (ALL SPECIES)	2.23	SPECIES RICHNESS (NATIVE)	21
MEAN C (NATIVE TREES)	3.25	% NON-NATIVE	0.30
MEAN C (NATIVE SHRUBS)	n/a	WET INDICATOR (ALL)	-0.53
MEAN C (NATIVE HERBACEOUS)	3.31	WET INDICATOR (NATIVE)	-0.90
FQAI (NATIVE SPECIES)	**14.62**	% HYDROPHYTE (MIDWEST)	0.73
FQAI (ALL SPECIES)	12.23	% NATIVE PERENNIAL	0.60
ADJUSTED FQAI	26.69	% NATIVE ANNUAL	0.10
% C VALUE 0	0.40	% ANNUAL	0.17
% C VALUE 1-3	0.27	% PERENNIAL	0.80
% C VALUE 4-6	0.27		
% C VALUE 7-10	0.07		

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
abuthe	Abutilon theophrasti	ABUTILON THEOPHRASTI	Velvetleaf	0	FACU	1	Forb	Annual	Adventive
agrgig	Agrostis gigantea	AGROSTIS ALBA	Black Bent	0	FACW	-1	Grass	Perennial	Adventive
ambart	Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	1	Forb	Annual	Native
ascinc	Asclepias incarnata	Asclepias incarnata	Swamp Milkweed	3	OBL	-2	Forb	Perennial	Native
bidcor	Bidens trichosperma	Bidens coronata	Crowned Beggarticks	9	OBL	-2	Forb	Annual	Native
cicmac	Cicuta maculata	Cicuta maculata	Spotted Water-Hemlock	6	OBL	-2	Forb	Perennial	Native
cirarv	Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
daucar	Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
eutgra	Euthamia graminifolia	Solidago graminifolia	Flat-Top Goldentop	4	FACW	-1	Forb	Perennial	Native
frapen	Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima	Green Ash	4	FACW	-1	Tree	Perennial	Native
geucan	Geum canadense	Geum canadense	White Avens	1	FAC	0	Forb	Perennial	Native
helgro	Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	4	FACW	-1	Forb	Perennial	Native
jundud	Juncus dudleyi	Juncus dudleyi	Dudley's Rush	2	FACW	-1	Forb	Perennial	Native
lobsip	Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	4	OBL	-2	Forb	Perennial	Native
lytsal	Lythrum salicaria	LYTHRUM SALICARIA	Purple Loosestrife	0	OBL	-2	Forb	Perennial	Adventive
pendig	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	0	Forb	Perennial	Native
polhyd	Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	-2	Forb	Annual	Native

phaaru	Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
popdel	Populus deltoides	Populus deltoides	Eastern Cottonwood	0	FAC	0	Tree	Perennial	Native
quebic	Quercus bicolor	Quercus bicolor	Swamp White Oak	5	FACW	-1	Tree	Perennial	Native
rumcri	Rumex crispus	RUMEX CRISPUS	Curly Dock	0	FAC	0	Forb	Perennial	Adventive
salamy	Salix amygdaloides	Salix amygdaloides	Peach-Leaf Willow	4	FACW	-1	Tree	Perennial	Native
scipen	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2	OBL	-2	Sedge	Perennial	Native
setvir	Setaria viridis	SETARIA VIRIDIS	Green Foxtail	0	UPL	2	Grass	Annual	Adventive
solalt	Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
sonarv	Sonchus arvensis	SONCHUS ARVENSIS	Field Sow-Thistle	0	FACU	1	Forb	Perennial	Adventive
astnov	Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	3	FACW	-1	Forb	Perennial	Native
astpil	Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
astpun	Symphyotrichum puniceum	Aster puniceus	Purple-Stem American-Aster	8	OBL	-2	Forb	Perennial	Native
vitrip	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Grainger Woods City/County: Mettawa/Lake County Sampling Date: 9/15/2022
Applicant/Owner: Lake County Forest Preserves State: IL Sampling Point: DP1-WL1
Investigator(s): Steven Rauch Section, Township, Range: 2, 43 N, 11 E
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave
Slope (%): 0-3 Lat: 42.230200 Long: -87.924161 Datum: GPS decimal
Soil Map Unit Name: Zurich and Nappanee silt loam (983B) NWI classification: PFO1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus bicolor*	40	Yes	FACW
2.			
3.			
4.			
5.			
	40	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Cephalanthus occidentalis*	10	Yes	OBL
2.			
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Carex lacustris*	20	Yes	OBL
2. *Carex lupina*	10	Yes	
3. *Iris virginica*	10	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		120 (B)
Prevalence Index = B/A =			1.50

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

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

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SOIL

Sampling Point: DP1-WL1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100					Loamy/Clayey	Silty clay loam
12-20	10YR 4/1	95	10YR 5/8	5	RM	M	Loamy/Clayey	Silty clay loam

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

The presence of a reduced matrix within 12" of the soil surface indicates that this soil is hydric based on the hydric soil definition: "a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part".

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 4

Water Table Present? Yes X No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Grainger Woods City/County: Mettawa/Lake County Sampling Date: 9/15/2022
Applicant/Owner: Lake County Forest Preserves State: IL Sampling Point: DP2-UPL
Investigator(s): Steven Rauch Section, Township, Range: 2, 43 N, 11 E
Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 0-3 Lat: 42.230200 Long: -87.924161 Datum: GPS decimal
Soil Map Unit Name: Zurich and Nappanee silt loam (983B) NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	50	Yes	FACU
2.			
3.			
4.			
5.			
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Rosa multiflora*	5	Yes	FACU
4.			
5.			
	25	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Geum canadense*	10	Yes	FAC
2. *Symphyotrichum drummondii*	10	Yes	UPL
3. *Solidago altissima*	10	Yes	FACU
4. *Poa pratensis*	10	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	30	x 3 =	90
FACU species	65	x 4 =	260
UPL species	10	x 5 =	50
Column Totals:	115 (A)		420 (B)
Prevalence Index = B/A =			3.65

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

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

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SOIL

Sampling Point: DP2-UPL

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/2	100					Loamy/Clayey	Silt loam
10-20	10YR 4/4	100					Loamy/Clayey	Silt loam

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Grainger Woods City/County: Mettawa/Lake County Sampling Date: 9/21/2022
Applicant/Owner: Lake County Forest Preserves State: IL Sampling Point: DP3-WL2
Investigator(s): Steven Rauch Section, Township, Range: 2, 43 N, 11 E
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave
Slope (%): 0-3 Lat: 42.234749 Long: -87.919321 Datum: GPS decimal
Soil Map Unit Name: Montgomery silty clay loam (465A) NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus bicolor*	20	Yes	FACW
2.			
3.			
4.			
5.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2.			
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Euthamia graminifolia*	40	Yes	FACW
2. *Symphyotrichum puniceum*	30	Yes	OBL
3. *Juncus dudleyi*	20	Yes	FACW
4. *Agrostis gigantea*	10	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	130 (A)		230 (B)

Prevalence Index = B/A = 1.77

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

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

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SOIL

Sampling Point: DP3-WL2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/1	100					Loamy/Clayey	Silty clay loam
14-20	10YR 4/1	95	10YR 5/8	5	RM	M	Loamy/Clayey	Silty clay loam

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Grainger Woods City/County: Mettawa/Lake County Sampling Date: 9/21/2022
Applicant/Owner: Lake County Forest Preserves State: IL Sampling Point: DP4-UPL
Investigator(s): Steven Rauch Section, Township, Range: 2, 43 N, 11 E
Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 0-3 Lat: 42.234749 Long: -87.919321 Datum: GPS decimal
Soil Map Unit Name: Nappanee silty clay loam (228C2) NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Euthamia graminifolia*	40	Yes	FACW
2. *Solidago altissima*	30	Yes	FACU
3. *Poa pratensis*	20	Yes	FAC
4. *Erigeron annuus*	10	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

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

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SOIL

Sampling Point: DP4-UPL

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					Loamy/Clayey	Silt loam
12-20	10YR 4/2	100					Loamy/Clayey	Silt loam

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

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ENG FORM 6116-7, JUL 2018 Midwest – Version 2.0

Photograph 1:

View facing east of DP1-Wetland 1.

Photograph 2:

View facing northeast of DP2-Upland.

Photograph 3:

View towards the south of DP3-Wetland 2.

Photograph 4:

View facing north of DP4-Upland.

STORMWATER MANAGEMENT COMMISSION

October 3, 2022

Mr. Matthew Ueltzen
Lake County Forest preserve District
1899 West Winchester Road
Libertyville IL 60048

Subject: SMC Permit File #IWLC-22-611
U.S. Army Corps of Engineers Ref. #LRC-2022-610
LCFPD: Grainger Woods Forest Preserve Hydrologic Restoration Project
Vernon Township, Lake County, IL
PRELIMINARY WETLAND JURISDICTIONAL DETERMINATION

Dear Mr. Ueltzen:

This letter responds to your request for a preliminary wetland jurisdictional determination (PJD) for the subject project area, received by the Lake County Stormwater Management Commission (SMC) on September 21, 2022. SMC reviewed available reference materials and performed a site reconnaissance on September 29, 2022 in the company of Mr. Michael Machalek of the U.S. Army Corps of Engineers-Chicago District (USACE), Ms. Juli Crane of SMC, and Mr. Steven Rauch of Hey & Associates, Inc. (Hey). Note that the wetlands/water features referenced in this letter are shown on the enclosed Exhibit 8: *Wetland Boundary*, by Hey, dated September 27, 2022.

Based on our findings, the project area appears to contain *waters of the United States* (WOTUS), which are subject to regulation by the USACE under Section 404 of the federal Clean Water Act, and *Isolated Waters of Lake County* (IWLC), which are subject to regulation by the SMC under the Lake County Watershed Development Ordinance (WDO, as amended, 10-13-2020), as follows:

Wetland 1 is a WOTUS. This wetland has a clearly discernible hydrologic connection to the navigable Des Plaines River (Lower Des Plaines River sub-watershed). The USACE concurred with the boundary of WOTUS Wetlands 1, as delineated and flagged by Hey (see enclosed PJD Field Report).

Wetland 2 is an IWLC. This wetland does not appear to have a clearly discernible hydrologic connection to a navigable water. The SMC concurred with the boundary of IWLC Wetland 2, as delineated and flagged by Hey (see attached PJD field report).

Roadside Ditch 1 is not considered to be a WOTUS (exempt water feature). It is SMC's determination that Roadside Ditch 1 meets exclusion criterion A.4. under the definition of IWLC in WDO-Appendix A (*roadside ditches*). **Therefore, Roadside Ditch 1 is not considered to be a regulatory wetland.**

This PJD has been approved by SMC's Chief Engineer and the findings are valid for a period of three (3) years from the date of this letter, unless new information warrants a revision before the expiration date. If you disagree with the findings of this PJD, you may request an approved JD (AJD) from the USACE.

For your information, SMC performed this PJD in accordance with the *Interagency Coordination Agreement (ICA) Between the U.S. Army Corps of Engineers, Chicago District, Lake County Stormwater Management Commission, and Lake County Department of Planning, Building and Development*, dated

June 4, 2002. We determined the jurisdiction of WOTUS on the subject project area based on the current definition in 33 U.S.C. 1344. Section 328.3(a), guidance provided in the EPA/USACE Memorandum entitled "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States" dated June 5, 2007 (revised 12-02-08), and the USACE's *Jurisdictional Determination Form Instructional Guidebook* dated May 30, 2007. For areas not considered to be WOTUS, we determined jurisdiction using the definition of *Isolated Waters of Lake County* (IWLC) contained in Appendix A of the WDO.

Permitting Considerations

1. This letter satisfies the requirement for a written jurisdictional determination under WDO §1001.

2. The surveyed wetland boundaries in the project area will need to be clearly depicted on the project plans for permitting purposes.

3. **A Lake County Watershed Development Permit (WDP), including IWLC impacts approval (as applicable), will be required from the SMC for the proposed project.** Please coordinate with Mr. Philip Ruiz, SMC's Principal Engineer, at pruiz@lakecountyil.gov for the WDP submittal requirements and Mr. Glenn Westman, SMC's Principal Wetland Specialist, at gwestman@lakecountyil.gov, for the IWLC submittal requirements.

4. **If the proposed project will require impacts to the WOTUS, a separate permit from the USACE will be required.** Please refer to the USACE-Chicago District's web site for the permit application submittal requirements: https://www.lrc.usace.army.mil/Missions/Regulatory/How-to-Submit-an-Application/. The USACE may require SMC's technical review/approval of the proposed soil erosion and sediment control plan (SE/SC) for the development as a condition of their permit. Site inspections for compliance with the approved SE/SC plans would also be required. We will advise you if our SE/SC review/approval is required.

We would like to be of assistance. If you have any questions, or would like to set up a meeting, please contact Mr. Westman at the above address. If you have any additional concerns that have not been addressed by the regulatory staff, you may contact Chief Engineer Brian Frank at bfrank@lakecountyil.gov.

Sincerely,
LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

Brian Frank, P.E., CFM
Chief Engineer

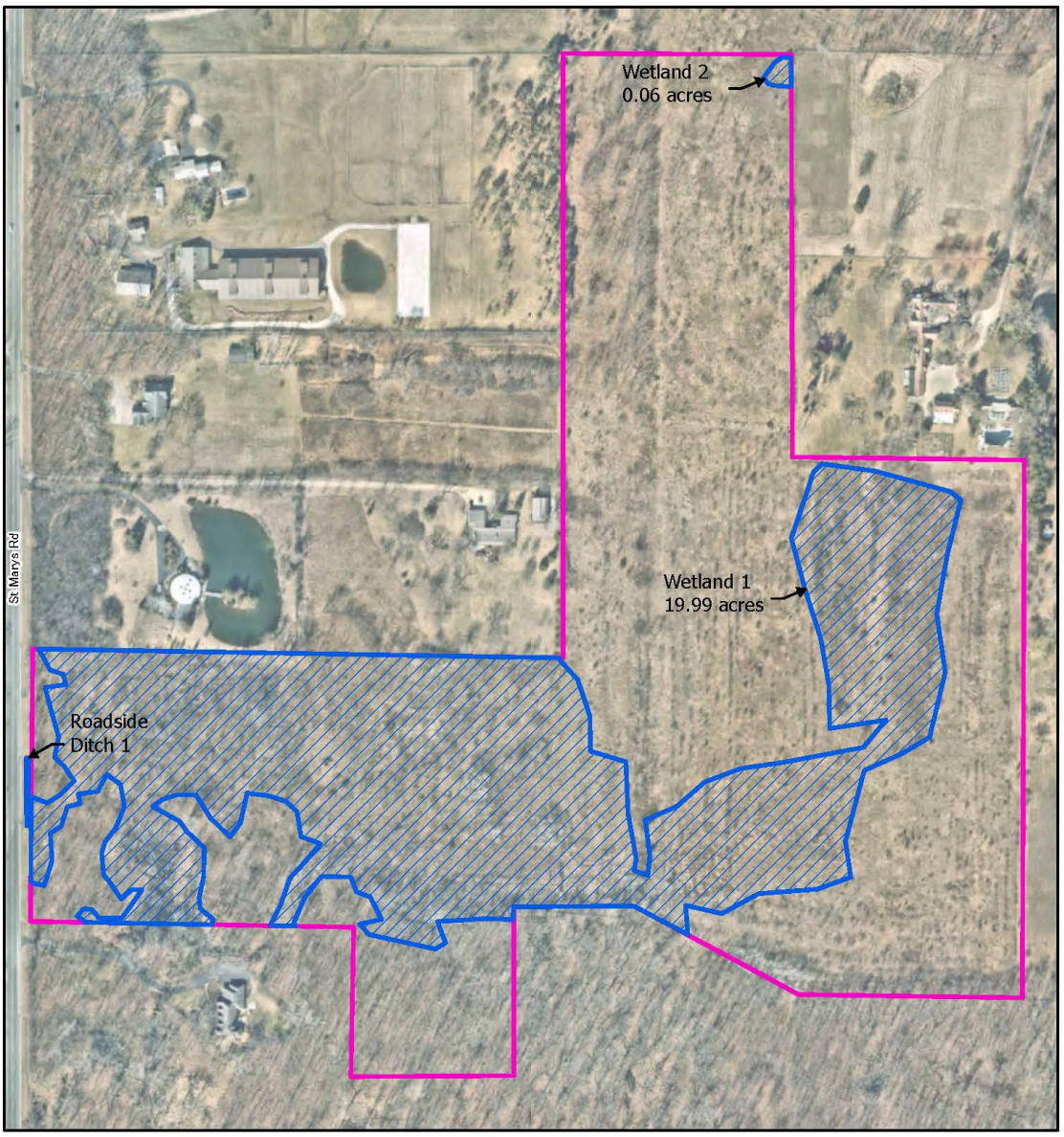
Glenn H. Westman, S.P.W.S., CWS, CFM
Principal Wetland Specialist

Enclosures: Exhibit 8 (Hey, 9-27-2022); SMC PJD Field Report (9-29-2022)

Cc: Kathy Chernich & Mike Machalek, USACE
Steve Rauch, Hey & Associates, Inc.
Philip Ruiz & Juli Crane, SMC

This document was digitally transmitted. Please print out a copy of the document and retain for your records. If you are unable to print the document, or desire a hard copy mailed be to you, please notify SMC at your earliest convenience.

U:\Regulatory Program\Permits\22 Permits\IWLC\IWLC-22-611 LCFPD Grainger Woods Hydro Restn PJD\PERMITS\PJD Ltr.docx



0 340 Feet

N
W E
S

Legend:
Project Boundary
Surveyed Wetland Boundary

Project Name:
Grainger Woods

Project Number: 22-0235

Prepared for:
Lake County Forest Preserve

Date: 9/27/2022

Aerial Date:
2020

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Exhibit Title:
Wetland Boundary

Exhibit:
8

Preliminary Jurisdictional Determination Field Report

Site Name: *WRF-Grainger Woods Hydrologic Restoration Site*

Date: *September 29, 2022 11:15 AM*

SMC/PBD #: *IWLC-22-611*

USACOE #: *LRC-2022-610*

Attendees:

USACOE Representative(s): *Mike Machalek*
List Other Corp Representative(s):
SMC/PBD Representative(s): *Juli Crane, Glenn Westman*
Other SMC/PBD Representative(s):
Other attendee(s): *Steve Rauch, CWS-Hey & Associates*

PJD Requestor:

Name/Contact Info: *Lake County Forest Preserve District (Matt Ueltzen, mueltzen@lcfpd.org)*

Site Info:

Address/PIN#: *East of St. Mary's Road, South of IL Route 60, near Mettawa, Lake County, IL*
Lat/Long: *42.230472, -87.921334*
Description: *Vacant Forest Preserve property - woodland, meadow, wetlands.*
References: *Wetland Boundary (Exhibit 8, Hey, 9-27-2022), FEMA Floodplain Map (2016), Aerial Photos (1939-2020, Lake County Online GIS Maps), Topographic Map - 1' contours (Lake County Online GIS Maps, 2007 & 2017), Lake County Soil Surveys (SCS 1970 & NRCS 2005), USGS Quadrangle Maps (1960, 1972, 1993), USGS Flood of Record Map (HA-71, 1963), Lake County Storm Sewer Network Maps (SMC GIS, 2022); Lake County Wetland Restoration & Preservation Plan - Online Decision Support Tool (SMC, 2020).*

Disposition of Waters of the US:

Site appears to contain Waters of the U.S.: *Yes, site DOES appear to contain Waters of the U.S.*
List wetland/water IDs from delineation map and basis: *Wetland 1 appears to have a clearly discernible hydrologic connection to the navigable Des Plaines River (Lower Des Plaines River sub -watershed).*
WOUS Exclusions: *Roadside Ditch 1 is an exempt water feature (constructed stormwater ditch).*
Corps representative concurs with staked/flagged WOUS boundaries: *Yes*
If Corp representative DOES NOT concur, please explain: *N/A*

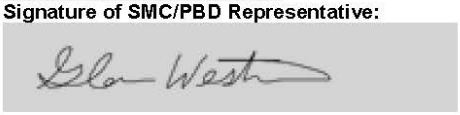
Disposition of Isolated Waters of Lake County:

Site appears to contain Isolated Waters of Lake County.: *Yes, site DOES appear to contain Isolated Waters of Lake County.*
List wetland/water IDs from delineation map: *Wetland 2 does not appear to have a clearly discernible hydrologic connection to a navigable water.*
Potential IWLC Exclusions: *Roadside Ditch 1 appears to meet WDO IWLC exclusion criterion A.4-roadside ditches.*
SMC/PBD representative concurs with staked/flagged IWLC boundaries: *Yes*
If SMC/PBD representative DOES NOT concur, please explain: *N/A*

Attests:

USACOE Representative Attestment: *Corp representative has reviewed the information herein and CONCURS with determination.*
Signature of USACOE Representative:

SMC/PBD Representative Attestment: *SMC/PBD representative has reviewed the information herein and CONCURS with determination.*
Signature of SMC/PBD Representative:



ATTACHMENT F - MONITORING & MANAGEMENT PLAN

FIVE-YEAR

MANAGEMENT AND MONITORING

PLAN

GRAINGER WOODS HYDROLOGIC RESTORATION PROJECT
GRAINGER WOODS CONSERVATION PRESERVE

LAKE COUNTY FOREST PRESERVE DISTRICT
LAKE COUNTY, ILLINOIS

JULY 25, 2023

INTRODUCTION

This Management and Monitoring Plan (Plan) pertains to the wetland enhancements, restorations and associated buffer enhancement areas located within the "Grainger Woods Hydrologic Restoration Project" area at Grainger Woods Conservation Preserve. This project is a result of wetland mitigation need within the Des Plaines River watershed due to impacts at an off-site property, administered through the Lake County Stormwater Management Commission's Wetland Restoration Fund. The project area is located north and east of the intersection of St. Mary's and Everett Roads in portions of Sections 2 and 11 of Vernon Township, T43 North, R11 East. The purpose of the proposed project is to achieve a mitigation acreage goal of 3.95 acres (credits), at a minimum. Mitigation will be provided off-site by the creation (establishment of wetland within current upland), restoration (reestablishment of former wetland) and enhancement (existing degraded wetland to be enhanced) of wetlands at Grainger Woods Conservation Preserve. As proposed, the plan includes 0.48 acres of wetland creation, 0.13 acres of wetland creation (within 50' boundary buffer), 8.58 acres of wetland restoration, 11.04 acres of wetland restoration (within 100' buffer), 3.45 acres of wetland restoration (within 50' boundary buffer),20.06 acres of wetland enhancement , and 3.81 acres of upland buffer enhancement for a total of 25.99 potential mitigation credits.

Tasks detailed in this five-year plan will be installation of native vegetation, vegetation management, and monitoring of the wetland creation/restoration/enhancement areas and associated buffer enhancement areas.

WETLANDS

Hydrologic restoration is anticipated to begin in the fall/winter of 2023. All drain tiles within the proposed project area will be disabled or daylighted. Additionally, any drainage berms/swales directing surface flows away from residential areas will be constructed at that same time. Initial invasive species removal/management and seeding/planting tasks and management period are anticipated to begin in 2024. Additional management and seeded efforts will occur in subsequent years, as needed. The goals of seeding and vegetation management will be to (re)create, restore, and enhance project areas to mimic the surrounding natural areas of Grainger Woods Conservation Preserve and Captain Daniel Wright Woods Forest Preserve.

Seed Installation

Seed installation consisting of native forbs and graminoids (list prepared by LCFPD; Attachment A) should commence between November 2024 and January 2025. The seed will be installed in a manner consistent with industry standards (e.g. hand broadcast). Seed should be installed with direct contact to

the soil surface after a controlled burn or draw down of water in the wetlands (ideally both). If necessary, additional seed shall be installed at the end of the second growing season (and subsequent growing seasons, as necessary). This supplemental seeding will be intended to assist the plant community in areas with low vegetative density or diversity and will allow for modifications to be made to the seed list based on site observations. Seed installation shall be installed by LCFPD natural resource staff. LCFPD reserves the right to alter seed species and rates based on availability and budget constraints.

Plant Plug Installation

Plant plugs will be installed in the second growing season (anticipated in spring/summer 2025). Plugs will be installed within appropriate communities to increase diversity and total vegetative cover. In general, many proposed species occur in wetlands where seed establishment can be lacking. Installing plugs will decrease establishment period duration. Plugs will consist of forb and graminoid species (list prepared by LCFPD; Attachment B).

Native Shrub Installation

Native shrubs will be installed at the project site in the fall of the second or third growing season (anticipated in 2025 and/or 2026). Plants (list prepared by LCFPD; Attachment C) will be installed within appropriate communities to increase diversity and enhance project communities.

MANAGEMENT ACTIVITIES

Weed management during the growing season shall be conducted both before and after seed installation activities to help promote the establishment of native species. Both controlled burning and chemical weed control methods will be performed as needed. After seeding and planting activities have been completed, spot herbicide treatments shall be made with appropriate herbicides in the growing season (April-November) to effectively control herbaceous weeds commonly associated with disturbed areas. Woody plant management (i.e. removal/herbicide treatment of invasive woody plants, including but not limited to exotic species such as, Rhamnus cathartica, Frangula alnus, Berberis spp., Lonicera spp., or native invasive species such as Populus spp., Acer negundo, Acer saccharinum, Ulmus spp., and Fraxinus spp.) will occur as needed in the dormant season (December-March) to maintain native diversity and limit dominance of woody species. Persons performing herbicide treatments during the execution of this plan shall have a current State of Illinois herbicide applicators/operators license and possess adequate experience in non-native species identification and management. All herbicides will be applied in strict accordance with label restrictions. Controlled burning shall be implemented at the project site if/when appropriate conditions allow, e.g. sufficient vegetation for fuel and dry weather/site

conditions. The District shall use budgeted resources and staff to continue long-term management of the mitigation site, which is part of a larger landscape scale restoration program to restore and conserve native communities and wildlife along the Des Plaines River in southern Lake County.

VEGETATION MONITORING

Vegetation data (except for Enhanced Wetland 2) will be collected using quadrat sampling and meander search methods. Sampling will be conducted twice during each growing season (e.g., May/June and August/September).

In lieu of vegetation sampling transects, the Lake County Forest Preserve proposes an alternate quantitative sampling method that aligns with the plant-pollinator community sampling data collection protocols. Quadrat sampling will occur at previously established LCFPD monitoring plots (permanent vegetation monitoring locations), as depicted on the attached map (Exhibit 3). Sampling will focus on the HQAR Wetland 1, non-HQAR Wetland 1, and the two created/restored wetland areas (i.e., Created/Restored Wetland – West and Created/Restored Wetland – East). Each plot will be monumented with a metal stake. Four 1.0-square meter quadrats will be sampled at each plot. In addition to taking photographs at selective plots (i.e., Wetland 1 Enhancement HQAR: GWCP-NP-027, GWCP-NP-028, GWCP-NP-029, and GWCP-NP-032; East – Wetland Restoration/ Creation/Buffer: GWCP-NP-021, GWCP-NP-033, GWCP-NP-036, and GW-NP-037; West – Wetland Restoration/Creation/Buffer: GWCP-NP-052 and GWCP-NP-053; Wetland 1 Enhancement non-HQAR: GWCP-NP-034 and GWCP-NP-051., as noted in Exhibit 3), the following data will be recorded at each plot and summarized with corresponding data for the applicable wetland mitigation community (where a quadrat is split by a mitigation community, data will consistently be applied to only one mitigation type):

1. The number and estimated percent areal coverage of each vascular plant species, including all non-native (adventive) taxa and native taxa. This data will be used to perform the calculations in items below.
2. The native mean C value, native FQI, and mean wetness coefficient will be calculated for each quadrat,
3. The native mean C value, native FQI, and mean wetness coefficient will be calculated for each plot,
4. The RIVn of total native species will be calculated by the following equation: RIVn = [RFn + RCn] / 2 x 100, where:

   RIVn is the relative importance value of the total native species in the zone,

   RFn is the total frequency of the native species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and

   RCn is the total coverage of the native species occurring in all quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

For comparative purposes, meander searches will be performed through the individual wetland mitigation communities (i.e., HQAR Wetland 1, Non-HQAR Wetland 1 Enhancement, Creation/Restoration – West, Creation/Restoration – East), and the buffer zone, and all observed plant species in each will be recorded per location. The native mean C value, native FQI and mean wetness coefficient (wetland zones) calculated from the meander search data will be compared to the transect (quadrat) data for the relevant mitigation communities.

For Enhanced Wetland 2, a meander survey will be performed during the final wetland delineation. The results will be compared with the pre-project values.

PERFORMANCE STANDARDS

Wetland Communities

The following performance standards apply to Enhanced Wetland 1 (non-HQAR), Created/Restored Wetland – West, and Created/Restored Wetland - East.

1. Floristic Quality: Each wetland community shall achieve a native mean C value of greater than or equal to 3.5 and a native FQI of greater than or equal to 20, as determined using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version).
2. Mean Wetness Coefficient: Each wetland community shall achieve a mean wetness coefficient of less than or equal to 0. Wetness coefficients are listed below, based on the category of each plant species designated in the National Wetland Plant List - Midwest Regional Plant List (U.S. Army Corps of Engineers, most recent version). The mean W for each wetland community is calculated by the following equation: Sum of wetness coefficients for all species/number of species.

   Wetness Coefficients:

National Wetland Category	Wetness Coefficient
Obligate (OBL)	-2
Facultative Wetland (FACW)	-1
Facultative (FAC)	0
Facultative Upland (FACU)	1
Upland (UPL)	2

3. Vegetative Cover: No area greater than 10 square feet within the created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
4. Invasive Species Dominance: None of the three dominant species within the mitigation communities shall be non-native or weedy species, including but not limited to, the following species: *Typha spp.*, *Phragmites australis*, *Poa compressa*, *Poa pratensis*, *Lythrum salicaria*, *Salix interior*, *Echinochloa crus-galli*, or *Phalaris arundinacea*. Dominance shall be based on the relative importance value (RIV) of each species, which is calculated by the following equation: RIVs = [RFs + RCs] / 2 x 100, where:

   RIVs is the relative importance value of the individual species in the community, RFs is the frequency of the individual species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and RCs is the coverage of the individual species occurring in all

quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

Enhanced Wetland 2

The area of Enhanced Wetland 2 (shown in Exhibit 3) shall achieve the following standards (as determined by a meander survey during the final wetland delineation, not based on plot data or semi-annual floristic inventories):

1. Floristic Quality: Project areas must maintain or improve upon the current native mean C value of 3.19 and maintain or improve upon the existing native FQI of 14.62.
2. Wetness Coefficient (vegetation): Vegetation within project areas shall maintain or improve upon (i.e., decrease) the mean wetness coefficient value of -0.90.
3. Vegetative Cover: No area greater than 10 square feet within the created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
4. Invasive Species Dominance: None of the three dominant species within the mitigation communities shall be non-native or weedy species.

HQAR Areas of Wetland 1

In addition to the performance standards in Section 8.2.1, the pre-project HQAR area of Wetland 1 (shown in Exhibit 3) shall also achieve the following standards:

1. Floristic Quality: Project areas must maintain or improve upon the current native mean C value of 4.37 and maintain or improve upon the existing native FQI of 53.71.
2. Wetness Coefficient (vegetation): Vegetation within project areas shall maintain or improve upon (i.e., decrease) the mean wetness coefficient value of -0.52.
3. Non-native woody species shall have less than 10 percent cover.
4. Project areas shall achieve the following additional performance lift related to the stability of the plant-pollinator community:
    a. Native pollinator species richness ≥ 20,
    b. Interaction evenness ≥ 0.6 (on a scale of 0-1), and
    c. Nestedness (weighted NODF) ≥ 15 (on a scale of 0-100).

Upland/Buffer Community

The following performance standards apply to the collective area of enhanced buffer associated with the mitigation site.

1. Floristic Quality: Project areas must achieve a native mean C value of greater than or equal to 2.5 and a native FQI of greater than or equal to 15, using the

Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version).

2. Vegetative Cover: No area greater than 10 square feet within created or enhanced wetlands shall be devoid of vegetation as measured by percent areal cover. Areas not meeting this standard shall be replanted. Devoid is defined as less than 10 percent.
3. Invasive Species Dominance: None of the three dominant plant species in the mesic prairie buffer community shall be non-native or weedy species, including, but not limited to, the following species: *Cirsium arvense, Melilotus spp., Alliaria petiolata, Poa compressa, Poa pratensis, Ambrosia artemisiifolia*, or *Rhamnus cathartica* and *R. frangula*. Dominance shall be based on the relative importance value (RIV) of each species, which is calculated using the equation above (8.2.1.4).

HYDROLOGY MONITORING

At least three (3) hydrology monitoring locations will be established in the created/restored wetland mitigation communities to assess the hydrologic conditions over time. The sample points will be monumented in the field with metal stakes. The proposed location of each sample point is shown on Exhibit 3. Exact locations will be determined in the field, located via GIS and shown on As-Built.

At a minimum, hydrology monitoring will be conducted on a monthly basis during the growing season months (approx. May-October) during the compliance period. The following hydrology data will be collected at each sample point, at a minimum:

1. Depth of inundation (in. or cm.), and
2. Soil moisture condition to a minimum depth of 18 in. (e.g., saturated, moist, dry).

The hydrology data will be recorded and presented in a summary table in the annual reports.

ANNUAL REPORTS

An annual report summarizing the results of the previous year's monitoring data will be submitted to the SMC's regulatory division by January 31st of the following year. The annual reports will contain, at a minimum: 1) a narrative summary of the vegetation and hydrology monitoring data; 2) a summary of the progress of native vegetation establishment relative to the performance standards, in table format; 3) an appendix containing the corresponding monitoring data; 4) photographs of select vegetation monitoring plots, and panoramic views (PMP stations) of the mitigation wetlands and buffer; 5) a narrative summary of the management practices employed during the previous year and photographs documenting these activities; 6) recommendations for proposed management practices to be employed during the following year, based on the monitoring results to date; and 7) the proposed schedule for management practices in the following year.

COMPLIANCE AND COMPLETION

Responsible Parties

Under the IGA, LCFPD is the permittee and responsible party for implementing the mitigation plan described herein until the performance standards listed in Sections 8.2.1, 8.2.2 and 8.2.3 have been met and SMC's regulatory division has provided written sign-off releasing the permittee from further responsibility. The permittee will take corrective measures as necessary to meet the referenced performance standards.

Upon written release from SMC's regulatory division, LCFPD will continue to assume responsibility for long-term management of the wetland and buffer and sufficient funds will be allocated annually to facilitate the management activities necessary to maintain the quality and functionality of the mitigation wetlands and buffer.

Notification

The permittee (LCFPD) will provide written notification, with supporting information, to SMC's regulatory division at the completion of the compliance period (when the performance standards are met). The supporting information will include 1) a post-project wetland delineation with surveyed boundaries (using GPS processed to 0.1-ft. horizontal accuracy) shown on a scaled plan (min 1" = 100 ft) and 2) a tabular summary of the credits generated, based on mitigation type.

Upon notification, SMC's regulatory division will review the submitted information and perform a site inspection to evaluate the success of the mitigation. If the mitigation goals and performance standards have been met, SMC's regulatory division will notify the permittee in writing that the permittee's responsibility for the mitigation site is officially released. A copy of the written release will be provided to the entity designated for long-term management of the mitigation site (LCFPD).

If SMC's regulatory division determines that the mitigation goals or performance standards have not been achieved based on the information submitted and a site inspection, SMC's regulatory division will notify the permittee in writing of the specific shortfalls. The permittee will be granted a specified time period to address the identified shortfalls. Failure to fully address the identified shortfalls within the specified time limit may result in an extended compliance period and withholding of sign-off from SMC's regulatory division.

ATTACHMENT A
PROPOSED SEED SPECIES LIST FOR GRAINGER WOODS

Species (Graminoids)	Common Name	Status	C	UPLAND SEED MIX	WETLAND SEED MIX
Bromus pubescens	WOODLAND BROME	FACU+	5	X	
Calamagrostis canadensis	BLUE JOINT GRASS	OBL	3		X
Carex annectens	LARGE YELLOW FOX SEDGE	FACW+	5	X	X
Carex blanda	COMMON WOOD SEDGE	FAC	1	X	
Carex cephalophora	SHORT-HEADED BRACTED SEDGE	FACU	3	X	
Carex cristatella	CRESTED OVAL SEDGE	FACW+	4		X
Carex crus-corvi	CROWFOOT FOX SEDGE	OBL	10		X
Carex davisii	AWNED GRACEFUL SEDGE	FAC+	7	X	
Carex gracillima	PURPLE-SHEATHED GRACEFUL SEDGE	FACU+	10	X	
Carex grayi	COMMON BUR SEDGE	FACW+	7		X
Carex grisea	WOOD GRAY SEDGE				X
Carex hirsutella	HAIRY GREEN SEDGE	UPL	4	X	
Carex hirtifolia	HAIRY WOOD SEDGE	UPL	5	X	
Carex intumescens	SHINING BUR SEDGE	FACW+	10		X
Carex jamesii	GRASS SEDGE	UPL	5	X	
Carex lacustris	COMMON LAKE SEDGE	OBL	6		X
Carex lupulina	COMMON HOP SEDGE	OBL	7		X
Carex molesta	FIELD OVAL SEDGE	FAC+	2	X	X
Carex normalis	SPREADING OVAL SEDGE	FAC	5	X	
Carex pellita	BROAD-LEAVED WOOLLY SEDGE	OBL	4		X
Carex pensylvanica	COMMON OAK SEDGE	UPL	5	X	
Carex projecta	LOOSE-HEADED OVAL SEDGE	FACW+	4		X
Carex radiata	STRAIGHT-STYLED WOOD SEDGE	FAC-	6		X
Carex retrorsa	DEFLEXED BOTTLE-BRUSH SEDGE	OBL	10		X
Carex rosea	CURLY-STYLED WOOD SEDGE	UPL	4	X	
Carex scoparia	LANCE-FRUITED OVAL SEDGE	FACW	7		X
Carex sparganioides	LOOSE-HEADED BRACTED SEDGE	FAC	3	X	
Carex sprengelii	LONG-BEAKED SEDGE	FACU	9	X	
Carex squarrosa	NARROW-LEAVED CATTAIL SEDGE	OBL	10		X
Carex stipata	COMMON FOX SEDGE	OBL	3		X
Carex tenera	NARROW-LEAVED OVAL SEDGE	FAC-	8	X	
Carex tribuloides	AWL-FRUITED OVAL SEDGE	FACW+	3		X
Carex tuckermanii	BENT-SEEDED HOP SEDGE	OBL	10		X
Carex vesicaria monile	TUFTED LAKE SEDGE				X
Carex vulpinoidea	BROWN FOX SEDGE	OBL	2		X
Cinna arundinacea	COMMON WOOD REED	FACW	5	X	X
Danthonia spicata	POVERTY OAT GRASS	UPL	3	X	
Elymus canadensis	CANADA WILD RYE	FAC-	4	X	
Elymus villosus	SILKY WILD RYE	FACU	5	X	
Elymus virginicus	VIRGINIA WILD RYE	FACW-	4	X	X
Festuca obtusa	NODDING FESCUE	FACU+	5	X	
Glyceria striata	FOWL MANNA GRASS	FACW	4	X	X
Hystrix patula	BOTTLEBRUSH GRASS	UPL	5	X	
Leersia oryzoides	RICE CUT GRASS	OBL	4		X
Muhlenbergia mexicana	LEAFY SATIN GRASS	FACW	5	X	X
Panicum latifolium	BROAD-LEAVED PANIC GRASS			X	
Poa palustris	MARSH BLUE GRASS	FACW+	9		X
Scirpus atrovirens	DARK GREEN RUSH	OBL	4		X
Scirpus cyperinus	WOOL GRASS	OBL	6		X
Scirpus pendulus	RED BULRUSH	OBL	4		X
Spartina pectinata	PRAIRIE CORD GRASS	FACW+	4		X

Species (Forbs)	Common Name	Status	C	UPLAND SEED MIX	WETLAND SEED MIX
Actaea pachypoda	WHITE BANEBERRY	UPL	7	X	
Agastache scrophulariaefolia	PURPLE GIANT HYSSOP	UPL	5	X	
Alisma subcordatum	COMMON WATER PLANTAIN	OBL	4		X
Allium canadense	WILD ONION	FACU	2	X	
Allium tricoccum	WILD LEEK	FACU	7	X	
Anemone quinquefolia	WOOD ANEMONE	UPL	7	X	
Anemone virginiana	TALL ANEMONE	UPL	5	X	
Anemonella thalictroides	RUE ANEMONE	UPL	7	X	
Antennaria neglecta	CAT'S FOOT	UPL	4	X	
Aquilegia canadensis	WILD COLUMBINE	FAC-	6	X	
Arisaema triphyllum	JACK-IN-THE-PULPIT	FACW-	4	X	
Asarum canadense	WILD GINGER	UPL	7	X	
Asclepias exaltata	POKE MILKWEED	UPL	9	X	
Asclepias incarnata	SWAMP MILKWEED	OBL	4		X
Aster cordifolius	HEART-LEAVED ASTER	UPL	7	X	
Aster drummondii		FACU	2	X	
Aster lateriflorus	SIDE-FLOWERING ASTER	FACW-	4	X	X
Aster macrophyllus	BIG-LEAVED ASTER	UPL	8	X	
Aster sagittifolius	ARROW-LEAVED ASTER	UPL	5	X	
Bidens frondosa	COMMON BEGGAR'S TICKS	FACW	1		X
Blephilia hirsuta	WOOD MINT	FACU-	8	X	
Camassia scilloides	WILD HYACINTH	FAC+	6	X	
Campanula americana	TALL BELLFLOWER	FAC	3	X	
Cassia hebecarpa	WILD SENNA	FACW	9		X
Caulophyllum thalictroides	BLUE COHOSH	UPL	8	X	
Chelone glabra	TURTLEHEAD	OBL	8		X
Cicuta maculata	WATER HEMLOCK	OBL	6		X
Cryptotaenia canadensis	HONEWORT	FAC	2	X	
Dentaria laciniata	TOOTHWORT			X	
Dioscorea villosa	WILD YAM	FAC-	7		X
Dodecatheon meadia	SHOOTING STAR	FACU	6	X	
Eupatorium perfoliatum	COMMON BONESET	FACW+	4		X
Eupatorium purpureum	PURPLE JOE PYE WEED	UPL	7	X	
Eupatorium rugosum	WHITE SNAKEROOT	UPL	4	X	
Galium concinnum	SHINING BEDSTRAW	[UPL]	5	X	
Gentiana flavida	YELLOWISH GENTIAN	FACU	9	X	
Geranium maculatum	WILD GERANIUM	UPL	4	X	
Helianthus strumosus	PALE-LEAVED SUNFLOWER	UPL	5	X	
Hydrophyllum virginianum	VIRGINIA WATERLEAF	FAC	5	X	
Iris virginica shrevei	BLUE FLAG	OBL	5		X
Isopyrum biternatum	FALSE RUE ANEMONE	UPL	8	X	
Lilium michiganense	TURK'S CAP LILY	FAC+	6	X	
Lobelia cardinalis	CARDINAL FLOWER	OBL	7		X
Lobelia inflata	INDIAN TOBACCO	FACU-	4	X	X
Lobelia siphilitica	GREAT BLUE LOBELIA	FACW+	6	X	X
Lysimachia ciliata	FRINGED LOOSESTRIFE	FACW	4	X	X

Species (Forbs)	Common Name	Status	C	UPLAND SEED MIX	WETLAND SEED MIX
Mimulus ringens	MONKEY FLOWER	OBL	6		X
Mitella diphylla	BISHOP'S CAP	FACU+	10	X	
Osmorhiza claytonii	HAIRY SWEET CICELY	FACU-	3	X	
Pedicularis canadensis	WOOD BETONY	FACU+	9	X	
Penstemon calycosus	SMOOTH BEARD TONGUE	FACU	7	X	
Penstemon digitalis	FOXGLOVE BEARD TONGUE	FAC-	4	X	
Phlox divaricata	WOODLAND PHLOX	FACU	5	X	
Phryma leptostachya	LOPSEED	UPL	4	X	
Polemonium reptans	JACOB'S LADDER	FAC	5	X	
Polygonatum canaliculatum	SMOOTH SOLOMON'S SEAL	FACU	3	X	
Polygonum virginianum	WOODLAND KNOTWEED	FAC	2	X	
Prenanthes alba	LION'S FOOT	FACU	5	X	
Pycnanthemum virginianum	COMMON MOUNTAIN MINT	FACW+	5	X	X
Ranunculus fascicularis	EARLY BUTTERCUP	FACU	6	X	
Rudbeckia hirta	BLACK-EYED SUSAN	FACU	1	X	
Rudbeckia laciniata	WILD GOLDEN GLOW	FACW+	5	X	X
Rudbeckia subtomentosa	SWEET BLACK-EYED SUSAN	FACU+	9	X	
Rudbeckia triloba	BROWN-EYED SUSAN	FAC-	3	X	X
Rumex orbiculatus	GREAT WATER DOCK	OBL	8		X
Sagittaria latifolia	COMMON ARROWHEAD	OBL	4		X
Saxifraga pensylvanica	SWAMP SAXIFRAGE	FACW	10		X
Scrophularia lanceolata	EARLY FIGWORT	FAC+	5	X	
Scrophularia marilandica	LATE FIGWORT	FACU-	4	X	
Scutellaria lateriflora	MAD-DOG SKULLCAP	OBL	5		X
Smilacina racemosa	FEATHERY FALSE SOLOMON'S SEAL	FACU	3	X	
Smilax lasioneura	COMMON CARRION FLOWER	UPL	5	X	
Solidago flexicaulis	BROAD-LEAVED GOLDENROD	FACU	7	X	
Solidago patula	SWAMP GOLDENROD	OBL	9		X
Solidago ulmifolia	ELM-LEAVED GOLDENROD	UPL	5	X	
Teucrium canadense	GERMANDER	FACW	3	X	
Thalictrum dasycarpum	PURPLE MEADOW RUE	FACW-	5	X	X
Triosteum aurantiacum	EARLY HORSE GENTIAN			X	
Verbena urticifolia	HAIRY WHITE VERVAIN			X	
Veronicastrum virginicum	CULVER'S ROOT	FAC	7	X	
Zizia aurea	GOLDEN ALEXANDERS	FAC+	7	X	

ATTACHMENT B
PROPOSED PLANT PLUG SPECIES LIST FOR GRAINGER WOODS

Species (Graminoids)	Common Name	Status	C	UPLAND PLANT PLUGS	WETLAND PLANT PLUGS
Calamagrostis canadensis	BLUE JOINT GRASS	OBL	3		X
Carex annectens	LARGE YELLOW FOX SEDGE	FACW+	5		X
Carex buxbaumii	DARK-SCALED SEDGE	OBL	10		X
Carex cephalophora	SHORT-HEADED BRACTED SEDGE	FACU	3	X	
Carex cristatella	CRESTED OVAL SEDGE	FACW+	4		X
Carex crus-corvi	CROWFOOT FOX SEDGE	OBL	10		X
Carex grayi	COMMON BUR SEDGE	FACW+	7		X
Carex intumescens	SHINING BUR SEDGE	FACW+	10		X
Carex lacustris	COMMON LAKE SEDGE	OBL	6		X
Carex lupulina	COMMON HOP SEDGE	OBL	7		X
Carex molesta	FIELD OVAL SEDGE	FAC+	2		X
Carex muskingumensis	SWAMP OVAL SEDGE	OBL	9		X
Carex pellita	BROAD-LEAVED WOOLLY SEDGE	OBL	4		X
Carex retrorsa	DEFLEXED BOTTLE-BRUSH SEDGE	OBL	10		X
Carex rosea	CURLY-STYLED WOOD SEDGE	UPL	4	X	
Carex scoparia	LANCE-FRUITED OVAL SEDGE	FACW	7		X
Carex sprengelii	LONG-BEAKED SEDGE	FACU	9	X	
Carex squarrosa	NARROW-LEAVED CATTAIL SEDGE	OBL	10		X
Carex stipata	COMMON FOX SEDGE	OBL	3		X
Carex tenera	NARROW-LEAVED OVAL SEDGE	FAC-	8	X	
Carex tribuloides	AWL-FRUITED OVAL SEDGE	FACW+	3		X
Carex tuckermanii	BENT-SEEDED HOP SEDGE	OBL	10		X
Carex vesicaria monile	TUFTED LAKE SEDGE	OBL	9		X
Carex vulpinoidea	BROWN FOX SEDGE	OBL	2		X
Danthonia spicata	POVERTY OAT GRASS	UPL	3	X	
Glyceria striata	FOWL MANNA GRASS	FACW	4		X
Leersia oryzoides	RICE CUT GRASS	OBL	4		X
Panicum latifolium	BROAD-LEAVED PANIC GRASS			X	
Poa palustris	MARSH BLUE GRASS	FACW+	9		X
Scirpus atrovirens	DARK GREEN RUSH	OBL	4		X
Scirpus cyperinus	WOOL GRASS	OBL	6		X
Scirpus pendulus	RED BULRUSH	OBL	4		X
Scirpus validus creber	GREAT BULRUSH	OBL	5		X
Spartina pectinata	PRAIRIE CORD GRASS	FACW+	4		X

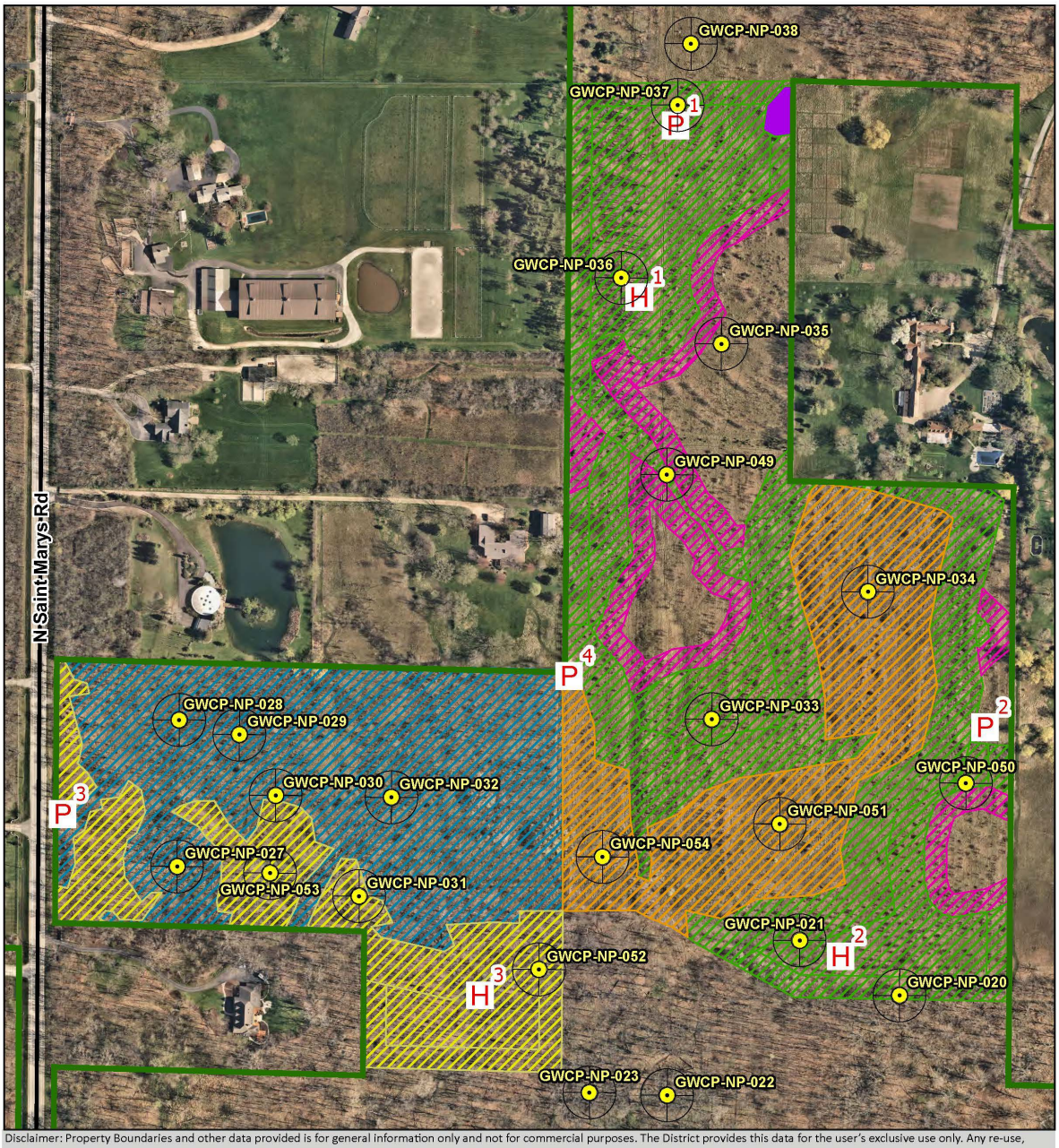
Species (Forbs)	Common Name	Status	C	UPLAND PLANT PLUGS	WETLAND PLANT PLUGS
Anemone canadensis	MEADOW ANEMONE	FACW	4		X
Anemone quinquefolia	WOOD ANEMONE	UPL	7	X	
Anemone virginiana	TALL ANEMONE	UPL	5	X	
Aquilegia canadensis	WILD COLUMBINE	FAC-	6	X	
Arisaema triphyllum	JACK-IN-THE-PULPIT	FACW-	4	X	
Asarum canadense	WILD GINGER	UPL	7	X	
Asclepias exaltata	POKE MILKWEED	UPL	9	X	
Asclepias incarnata	SWAMP MILKWEED	OBL	4		X
Aster lateriflorus	SIDE-FLOWERING ASTER	FACW-	4	X	
Aster macrophyllus	BIG-LEAVED ASTER	UPL	8	X	
Aster sagittifolius	ARROW-LEAVED ASTER	UPL	5	X	
Caltha palustris	MARSH MARIGOLD	OBL	8		X
Chelone glabra	TURTLEHEAD	OBL	8		X
Cicuta maculata	WATER HEMLOCK	OBL	6		X
Dentaria laciniata	TOOTHWORT	FACU	5	X	
Eupatorium perfoliatum	COMMON BONESET	FACW+	4		X
Gentiana flavida	YELLOWISH GENTIAN	FACU	9	X	
Geranium maculatum	WILD GERANIUM	UPL	4	X	
Hydrophyllum virginianum	VIRGINIA WATERLEAF	FAC	5	X	
Iris virginica shrevei	BLUE FLAG	OBL	5		X
Isopyrum biternatum	FALSE RUE ANEMONE	UPL	8	X	
Lilium michiganense	TURK'S CAP LILY	FAC+	6	X	
Lobelia cardinalis	CARDINAL FLOWER	OBL	7		X
Lobelia inflata	INDIAN TOBACCO	FACU-	4	X	
Lobelia siphilitica	GREAT BLUE LOBELIA	FACW+	6		X
Lycopus americanus	COMMON WATER HOREHOUND	OBL	4		X
Lysimachia ciliata	FRINGED LOOSESTRIFE	FACW	4		X
Mimulus ringens	MONKEY FLOWER	OBL	6		X
Mitella diphylla	BISHOP'S CAP	FACU+	10	X	
Phlox divaricata	WOODLAND PHLOX	FACU	5	X	
Phryma leptostachya	LOPSEED	UPL	4	X	
Physostegia virginiana	OBEDIENT PLANT	FACU	4		X
Polemonium reptans	JACOB'S LADDER	FAC	5	X	
Rumex orbiculatus	GREAT WATER DOCK	OBL	8		X
Sagittaria latifolia	COMMON ARROWHEAD	OBL	4		X
Saxifraga pensylvanica	SWAMP SAXIFRAGE	FACW	10		X
Scutellaria lateriflora	MAD-DOG SKULLCAP	OBL	5		X
Solidago flexicaulis	BROAD-LEAVED GOLDENROD	FACU	7	X	
Solidago patula	SWAMP GOLDENROD	OBL	9		X
Solidago ulmifolia	ELM-LEAVED GOLDENROD	UPL	5	X	
Veronicastrum virginicum	CULVER'S ROOT	FAC	7		X

ATTACHMENT C
PROPOSED TREE/SHRUB SPECIES LIST FOR GRAINGER WOODS

Species (Trees)	Common Name	Wetland Status	C	UPLAND AREAS	WETLAND AREAS
Amelanchier laevis	ALLEGHENY SHADBLOW	UPL	8	X	
Carpinus caroliniana	MUSCLEWOOD	FAC	8	X	
Carya cordiformis	BITTERNUT HICKORY	[FACU]	7	X	
Carya ovata	SHAGBARK HICKORY	FACU	5	X	X
Crataegus mollis	DOWNY HAWTHORN	FACU-	2	X	X
Malus ioensis	IOWA CRAB	UPL	3	X	
Ostrya virginiana	HOP HORNBEAM	FACU-	5	X	
Species (Shrubs)	**Common Name**	**Wetland Status**	**C**	**UPLAND AREAS**	**WETLAND AREAS**
Cephalanthus occidentalis	BUTTONBUSH	OBL	5		X
Cornus obliqua	BLUE-FRUITED DOGWOOD	FACW+	6		X
Cornus stolonifera	RED-OSIER DOGWOOD	FACW	6		X
Corylus americana	AMERICAN HAZELNUT	FACU-	5	X	
Ilex verticillata	WINTERBERRY	FACW+	9		X
Prunus americana	WILD PLUM	UPL	5	X	
Prunus virginiana	CHOKE CHERRY	[FACU]	3	X	
Ribes americanum	WILD BLACK CURRANT	FACW	7	X	X
Ribes missouriense	WILD GOOSEBERRY	UPL	5	X	
Rosa setigera	ILLINOIS ROSE	FACU+	7	X	X
Staphylea trifolia	BLADDERNUT	FAC	7	X	X
Viburnum lentago	NANNYBERRY	FAC+	5	X	X
Viburnum prunifolium	BLACK HAW	FACU	5	X	

ATTACHMENT D

SMC WETLAND RESTORATION FUND - RFP 2022
PROPOSED PROJECT AREA - GRAINGER WOODS CONSERVATION PRESERVE



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Lake County Forest Preserves

Map Created on 10/24/2023

0 210 420

Feet

N

LEGEND

- P — PHOTO MONITORING POINTS
- H — HYDRO MONITORING POINTS
- FOREST PRESERVE BOUNDARIES
- Nested Area Centroids

MITIGATION TYPES

- UPLAND BUFFER
- WEST - WETLAND RESTORATION/ CREATION/BUFFER
- EAST - WETLAND RESTORATION/ CREATION/BUFFER
- WETLAND 1 ENHANCEMENT HQAR
- WETLAND 1 ENHANCEMENT NON-HQAR
- WETLAND 2 RESTORATION ENHANCEMENT