Baumeister Parcel Vegetation Management Plan

Baumeister Parcel

Town of Burlington, Racine County, Wisconsin

August 24, 2023

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Town of Burlington, Racine County, Wisconsin

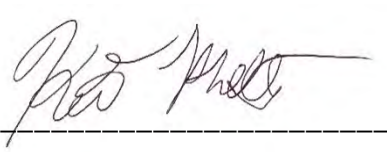
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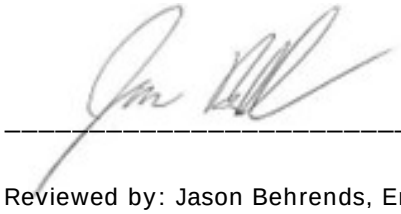
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1.0 Introduction

On behalf of Bohner's Lake Sanitary District ("BLSD"), Heartland Ecological Group ("Heartland") is pleased to present this Aquatic Invasive Species Management Plan for the Baumeister Parcel. The Baumeister parcel (the "Study Area") is approximately 45.71 acres in size and is currently owned by BLSD. The Study Area was initially established as the Baumeister Wetland Mitigation Site in 2006 by the WI Department of Transportation (WisDOT). In 2011, the Study Area achieved its wetland performance standards and completed all regulatory obligations of establishing and managing the wetland mitigation site per the Mitigation Banking Instrument (MBI). BLSD acquired the property in 2021 for wetland preservation and water quality protection and based on land covenants and the existing conservation easement must maintain, or improve, the current natural vegetative communities, including various wetlands, present on-site (based on a 2020 botanical baseline assessment survey) (Appendix I – Land Covenants). This management plan will summarize the WDNR NR 40 and invasive plant threats to wetland communities within the Study Area and propose long-term management actions for the continued establishment of the natural vegetation therein.

Due to the completion of all wetland mitigation bank regulatory obligations, this management plan is not designed to improve vegetation performance standards for a wetland mitigation bank project. The document's intended purpose is to serve as a guidance document that outlines goals and objectives to assist in long-term vegetation management for wetland communities within the Study Area. This includes serving as the management plan for any future applications for a Surface Water Grant focused on aquatic invasive plant reduction within the Study Area.

2.0 Baseline Data & Assessment

2.1 Study Area Introduction

The 45.71-acre Study Area lies approximately ¼ mile northeast of the intersection of County Trunk Highway (CTH) P / McHenry Street and Warren Road, in the NW ¼ of Section 19, T2N, R19E, Town of Burlington, Racine County Wisconsin (Figure 1 - Project Location Map). The Study Area lies within the Southeast Fox Illinois River Basin and is contiguous to Spring Brook Creek which comprises the eastern and southern boundary of the Study Area. Spring Brook Creek serves as the inlet flowing water to Lake Bohner (located approximately 0.66 miles to the northeast of the Study Area), a waterbody of high management priority

for BLSD. Spring Brook Creek is also a tributary of the Fox River, an impaired water of the State due to Phosphorus and PCB contamination (Impaired Water – Fox River, WDNR 2022).

The Study Area was a WisDOT wetland mitigation bank site which achieved its full performance standards in 2011. As such, the entirety of the Study Area consists of restored native vegetation communities of differing degrees of floristic quality. Based on a 2020 Heartland baseline vegetation summary (Appendix A), the Study Area is comprised of the following vegetative communities: tallgrass prairie, wooded edges, deep marsh, shallow marsh, wet meadow, and ditch margins within Spring Brook. The dominant wetland communities in terms of acreage are Deep Marsh (6.09 ac), Shallow Marsh (5.89 ac), and Wet Meadow (21.64 ac) (Figure 2, Baumeister Vegetation Communities and Attachment 4, Appendix A). The wetland communities, as well as the portions of Spring Brook Creek occurring within the Study Area, are the subject and scope of this Management Plan.

2.2 Spring Brook Creek and Lake Bohner Watershed Overview

The Spring Brook Creek (WBIC 750400) is an approximately 8.15 mile Cool-Cold and Cool-Warm Headwater located in Kenosha and Racine counties which is part of the Lower Fox River – Illinois Watershed (Spring Brook, Lower Fox River Illinois Watershed, WDNR 2016). Spring Brook Creek also functions as the inlet flowing water to Lake Bohner. Around the Study Area, Spring Brook Creek has an approximately 1,860.3-acre watershed with an approximate 1,498.41 acre-ft annual runoff volume (Appendix B – 2015 WDOT Wetland Mitigation Site Erosion Problem Memorandum). Spring Brook Creek also has 2-year flows which average 40 cubic feet per second (cfs) while 10-year flows average 56 cfs (Appendix B). Within the Study Area, Spring Brook Creek is effectively a channelized agricultural ditch which exhibits no meandering pattern and the natural community may best be described as Cool-Warm Headwater based on the WDNR 2020 Comprehensive Water Quality Assessments. The waterway is not an Outstanding Resource Water or Exceptional Resource water.

Lake Bohner (WBIC) is an approximate 135-acre kettle lake with a shore length of 1.9 miles, maximum depth of 30ft., and a mean depth of 9.2 feet (Appendix C – 2004 Bohners Lake Aquatic Plant Management Plan). The lake was last monitored in 2022 and fish and aquatic life conditions were listed as excellent. The lake may best be classified as a Deep Lowland lake and is not an Outstanding Resource Water or Exceptional Resource water.

Spring Brook WISCALM Data

Spring Brook Creek was last monitored in 2015 and the overall general condition is listed as Good, however fish habitat is listed as Poor (Spring Brook, Lower Fox River Illinois Watershed, WDNR 2016). As the waterway is in the Lower Fox River – Illinois watershed, the waterway is ranked high for runoff impacts based on the overall watershed condition. The closest monitoring station to the Study Area is the Spring Brook at Fishman Rd station (ID 10041199). This station's most recent data is from 2006, and a review of WISCALM monitoring data shows this report is related to an October 2005 – September 2006 lake inlet bed load and sedimentation Study (Appendix D - 2007 Bohner Lake Inlet Bed Load Study). Unfortunately, 2015 monitoring data links on WDNR's Surface Water Data Viewer (SWDV) web interface were expired and thus the 2007 Bohner Lake Inlet Study is the most relevant data. The results of this study indicate that an estimated 429-acre-feet (8.913 inches) of water entered Lake Bohner from the Spring Brook Creek Tributary during the monitoring period. In addition, approximately 1,839 cubic yards of bed load material that is over 77% organic in nature was shown to be entering the Lake Bohner inlet annually during the monitoring period (Appendix D). It was hypothesized that this bed load deposition was due to eroding agricultural ditches which was confirmed in 2015 with a follow-up erosion study by WisDOT (Appendix B).

Lake Bohner WISCALM Data

Supporting WisCALM data for Lake Bohner is summarized in Table 1 whereas landcover for its watershed drainage area is summarized in Table 2.

Table 1. Summary of Lake Bohner WISCALM Data

Lake Drainage Area:	2,638.00 acres
Lake Volume:	1,243-acre-ft
Mean Annual Discharge into Lake:	1.72 cfs
Drainage Density:	0
Average Annual Phosphorous Load (low estimate):	444 lbs.
Average Annual Phosphorous Load (median estimate):	920 lbs.

Average Annual Phosphorous Load (high estimate):	2,518 lbs.

**Lake Drainage Area based on lake area and internally drained areas not draining into another waterbody >5 acres or stream. Average annual total phosphorus load to lake predicted by land cover export coefficients.*

Table 2. Summary of Land Cover Types in Lake Bohner Drainage Area

Land Cover Type	Acreage
Rural Residential Land	475.00
Medium and High Density Urban	4.00
Pasture/Grassland	386.00
Row Crop/Cropland	790.00
Forested	582.00
Wetland	208.00
Open Water	184.00
Pasture/Grassland (within 60 meters of Streams)	14.60
	2,644

2.3 Bohner's Lake Sanitary District (BLSD) Overview

BLSD was created in 1990 to facilitate the collection of sewage from residences in the district boundaries to eliminate septic systems contributing to lower water quality within Lake Bohner (Bohner's Lake Sanitary District, 2021). The Bohner's Lake Management Committee (BLMC) is a subcommittee of BLSD which manages projects related to maintaining and/or improving the ecological and water quality standards within Lake Bohner, its inlets, and surrounding wetland vegetation. These projects have included surveys, water quality monitoring, volunteer events, and invasive plant management.

Based on the 2004 Aquatic Plant Management Plan (APM) for Lake Bohner (Attachment C – Available online through WDNR), BLSD has four core initiatives which include:

- Controlling Exotic and Nuisance Plant Species.
- Preserving and Enhancing the Natural Lake Environment through education and enforcement of ordinances.

- Identifying local educational efforts for lake issues.
- Conduct in-lake management activities to minimize management activities.

As of 2012, BLSD is also interested in investing continued resources in the preservation, conservation, and restoration of native wetland communities for the benefit of native pollinators, wildlife, native plant populations, and surface water quality within the Lake Bohner watershed. As such, the acquisition and management of the Baumeister site is an important initiative for BLSD as it protects water quality while ensuring the continued preservation of native flora and fauna within the Lake Bohner watershed. Over the course of 2012-2022, BLSD has developed numerous partnerships with organizations and private landowners who seek to implement continued vegetation management on the Baumeister parcel. BLSD has developed relationships with private landowners adjoining the Study Area, the Racine Co. Natural Resources Conservation Service (NRCS), US Army Corps of Engineers (USACE), and WDNR. These organizations have all provided valuable input and guidance in the preparation of the management plan and will continue to be important partners in the long-term management of the site.

2.4 Historic Vegetation Assessments and Management Actions

Multiple vegetation assessments have been conducted within the Study Area over the period of 2007-2020. These vegetation assessments were conducted as part of the wetland WisDOT mitigation bank monitoring from 2007-2011 (Appendix G – WisDOT Monitoring Reports), and as supplemental surveys from 2017-2020 to document invasive species presence and herbicide treatments within the Study Area once it had achieved its full wetland mitigation bank performance standards (Appendix H – Rober E. Lee & Associates Vegetation Management Reports). A summary of historic vegetation report findings is provided in Table 3. The Study Area can be shown to be gradually increasing populations of four (4) invasive and NR 40 species over time: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), and narrow leaf cattail (*Typha angustifolia*). Based on the WDNR NR. 40 Regulated Species List (Invasive Species Rule – NR 40, WDNR 2021), purple loosestrife is listed as a prohibited species while narrow leaf cattail and common reed are listed as restricted. While parent varieties of reed canary grass are currently not listed as an NR 40 species, reed canary grass is an invasive wetland plant which poses significant ecological threats in the state of Wisconsin. Reed canary grass often forms monotypic stands in wet meadows and wet prairies. These monotypic stands reduce native competition and the overall abundance and diversity of native wetland graminoids (i.e. grasses and sedges) and forbs. In turn, decreased native

wetland vegetation cover results in poor native pollinator habitat, limited wildlife forage, and in some instances altered hydrology of wetland areas.

From 2007-2011, reed canary grass is observed in the Study Area and gradually increases from 0.28% to 2.84% relative cover (Table 3 and Appendix G). Similarly, from 2007-2011 narrow leaf cattail increases in overall percent cover from 0.05% in 2009to 0.22% relative cover in 2011 (Table 3 and Appendix G). No mention or observation of purple loosestrife or common reed are present in the vegetation monitoring reports, and in the 2011 monitoring report, herbicide treatment of reed canary grass populations is recommended as a management action. After a 6-year gap in consistent vegetation management and monitoring, Robert E. Lee and Associates performed a timed meander invasive survey in 2017 which showed a significant increase in reed canary grass populations and one (1) isolated population of common reed (Figure 3 and Table 3). Follow up herbicide spot treatments and mowing management occurred in 2018 and 2019 (Figures 4, 5 and Table 3) and purple loose strife was first observed and managed in 2018 at one (1) location with continued treatments at the location in 2019 (Figures 4, 5 and Table 3). Various other upland NR 40 listed species such as garlic mustard (*Allaria petiolata*) were also managed concurrently with wetland invasives. Populations of garlic mustard primarily occur in wooded edges and tallgrass prairie surrounding the wetland communities.

In 2020, Heartland performed another timed meander survey to assess the benchmark floristic conditions of vegetative communities within the Study Area (Appendix A and Table 3). Wetland communities were shown to range from Very Poor (especially in the Spring Brook Creek Margins) to Fair when measured against the condition category benchmarks outlined in the Provisional Wetland Floristic Quality Benchmarks for Wetland Monitoring and Assessment in Wisconsin (Marti, A.m, and T.W. Bernthal. 2019). Overall, it was estimated that the wetland communities were comprised of 20-30% invasive species relative cover with the typical invasive being reed canary grass. However, certain areas within the site, such as the SW-NE Ditch corridor, had higher relative cover of reed canary grass. In the marsh communities, narrow leaf cattail was shown to be between 10-20% relative cover. While purple loose strife and common reed was not noted in the 2020 timed meander survey, individual plants may still be persisting onsite and may not have been detected on the meandering paths or because of the late growing season survey. From the 2020 survey and historic invasive management actions, numerous invasive management recommendations were proposed for the Study Area (Appendix E – 2022 Heartland Vegetation Management Proposal) which may be found in Section 3.2.

Table 3. Summary of Historic Vegetation Assessments and Management Actions for the Baumeister Site

Vegetation Assessment Year	Vegetation Assessment Author	Survey Methods	Wetland Invasive Threats	Wetland Management Actions	Other Notes
2007	WisDOT	Line-intercept and Vegetation Transect	*Phalaris arundinacea* relative cover observed to be 0.28%.	Various herbicide treatments although none explicitly described in monitoring report.	Nonnative weedy generalists (e.g. *Setaria glauca, Persicaria maculatum*, *Persicaria hydropiper*) occupy 44.37% relative cover.
2009	WisDOT	Line-intercept and Vegetation Transect	*P. arundinacea* relative cover observed to be 2.06%. *T. angustifolia* first observed and increases to 0.05% relative cover.	Various herbicide treatments although none explicitly described in monitoring report.	Nonnative weedy generalists decrease overall relative cover to 8.32% (includes *P. arundinacea*). *T. angustifolia* increases in overall cover.
2011	WisDOT	Line-intercept and Vegetation Transect	*P. arundinacea* relative cover observed to be 2.84%, *Cirsium arvense* is 0.08%. *T. angustifolia* increases again to 2.86% relative cover.	Various herbicide treatments although none explicitly described in monitoring report.	Mitigation bank meets all performance standards and regulatory compliance.
2017	Robert E. Lee & Associates, Inc.	Timed Meander	*P. arundinacea* (northern area of site observed to be 95-100% cover, western portions average 25-75% cover), *A. petiolata, Phragmites australis* (1 location)	· *(1) P. arundinacea* mowing in June. · (1) *P. arundinacea* and *Phragmites australis* foliar spot herbicide treatment in Oct.	*P. arundinacea* significantly increases in cover from 2011 based on population polygons (Figure 3). Central portions of Study Area have low cover (1-5%) whereas borders of site show increase in cover. Areas treated are not described. *A. petiolata* also present in wooded areas. No *T. angustifolia* management.
2018	Robert E. Lee & Associates, Inc.	Timed Meander	*P. arundinacea* (central portion of the site at 0-5% cover), *P. australis* (1	· (2) *P. arundinacea* foliar spot herbicide treatments in June.	Only the central invasive species area is depicted with treatment lines and cover class (Figure 4). Assumed

			location) and *Lythrum salicaria* (1 location) observed	· (1) *P. australis* and P. *arundinacea* foliar spot herbicide treatment in Sept.	only the central portion of the Study Area was treated. No *T. angustifolia* management.
2019	Robert E. Lee & Associates, Inc.	Timed Meander	*P. arundinacea* (central portion shows 0-5% cover, southern and eastern edges show 25-50% cover) *A. petiolata, Typha* sp., *P. australis, L. salicaria*	· (1) *P. arundinacea* foliar spot herbicide treatment in June. · (1) *P. australis*, *Typha* sp., and *P. arundinacea* foliar spot herbicide treatment in July. · (1) *P. arundinacea* and *L. salicaria* herbicide spot treatment in Aug. · (2) *P. arundinacea* herbicide spot treatments in Oct.	Central as well as the southern and eastern Study Area boundaries are where herbicide was treated for *P. arundinacea* (Figure 5). No *T. angustifolia* management.
2020	Heartland Ecological Group	Timed Meander	*Phalaris arundinacea, A. petiolata, Typha* sp. Wetland communities are listed to be comprised of 20-30% invasive species (primarily *P. arundinacea*). *T. angustifolia* in marsh communities ranges between 10-20% cover.	None (although mowing, herbicide spot treatment, and prescribed fire are recommended).	· SW/NE ditch corridor contains 36% nonnative/invasive relative cover and is in Very Poor Condition. · S. Property line contains 39% non-native/invasive relative cover and is in Very Poor Condition. · Wet Meadows range from 3-15% nonnative/invasive relative cover and range from Poor-Fair condition. · Spring Brook Ditch Margins contain 20% nonnative/invasive relative cover and range from Poor/Very Poor Condition.

3.0 Current Management Goals & Objectives

3.1 Summary of Present Management Threats

Based on the historic management assessments, there is a documented increase of NR 40 listed narrow leaf cattail on site with small populations of common reed and purple loosestrife from 2007-2011. Concurrently, there is an increase of reed canary grass populations observed over the same time period. This increase of NR 40 and invasive plants within the Baumeister site hampers BLSD's core mission values of controlling invasive species and preserving native wetland communities. Principal plant species in need of continued management include narrow leaf cattail and reed canary grass, with secondary species including common reed and purple loosestrife due to lower population levels. While invasive species have been managed periodically from 2005-2019, current invasive species management only consists of periodic mowings. BLSD is concerned that a lack of a multi-year strategy coupled with continued gaps in invasive management will lead to the spread and relative cover dominance of reed canary grass, narrow leaf cattail, purple loosestrife, and common reed- resulting in a lower floristic quality and functional value of the native wetlands on-site.

In turn, the continued population growth of NR 40 and invasive species deviates away from requirements of the land covenants which specify the management of invasive plant species to promote a "natural state" and maintain, or reduce, invasive plant populations when compared to the 2020 baseline assessment levels. Thus, these management threats cannot be ignored.

3.2 Management Recommendations & Proposed Plan

Based on the compilation of historic assessments as well as a 2022 proposal for long-term vegetation management (Appendix E), management plan recommendations include the following. Proposed high priority treatment areas are outline in Figure 6 and are discussed in further in Section 3.5.

1. Conduct Invasive Species Management Utilizing the Following Techniques:
    a. Low Volume Spot Spray Herbicide Applications
    b. UTV/ATV Boom Spray and/or Pistol Spray Herbicide Applications
    c. Maintenance Mowing
    d. Prescribed Fire

e. Native Seeding

3.3 Potential Adverse Effects of Management Plan Recommendations & Applicable Permitting

Invasive Species Management

Potential adverse side effects for this management plan recommendation are mainly related to negative environmental health effects to the Study Area, lands immediately adjacent to it, and the potential of injury to contractors and the public. For example, the use of herbicide applications inherently comes with some risks. Of primary concern is the potential for exposure to herbicides from the applicator through acute exposure (i.e. spilling herbicide on hands during mixing and loading) or chronic exposure (i.e. prolonged multi-year exposure from contact with herbicides). Other herbicide risks include non-target injury to desired vegetation or croplands (i.e. overspray or herbicide drift in high humidity or windy days), and spill/ contamination to Waters of the State. Spills and contamination of groundwater can in turn negatively affect the health of the public.

To mitigate the risk to the public, native vegetation, and Waters of the State, BLSD will only hire contractors that house WI Dept. of Trade, Agriculture, and Consumer Protection (DATCP) licensed and certified herbicide applicators. This professional licensure ensures the contractor has staff that have successfully passed state herbicide license requirements- including training on personal risk reduction, spill response, herbicide regulations within and around waterways, and appropriate mixing and application protocols based on herbicide types. BLSD will also utilize the contractor to acquire Chapter NR107 Aquatic Plant Control and WI Pollution Discharge Elimination System (WPDES) Aquatic Pesticides general permits. These permits will be needed to apply herbicide in aquatic areas, including wetlands. Based on the requirements of NR107, BLSD may only utilize contractors certified in Commercial Certification Category 5.1: Aquatic & Mosquito within aquatic areas. The contractor must also apply all herbicides in accordance with label directions. Additionally, the utilization of other non-herbicide management techniques as part of an Integrated Pest Management Strategy (IPM), such as maintenance mowing, native seeding, and prescribed fire, ensures herbicide applications aren't the sole management tool used and decreases the annual amount of herbicide applied within the Study Area. Effectively, risks in the use of herbicide are mitigated by professionally trained applicators, proper state-wide permitting, and the use of herbicide in accordance with label instructions.

While prescribed fire is a highly beneficial management tool due to its ability to kill invasive species, promote soil conditions conducive for native species establishment, and reduce "thatch" or dead plant material, it also comes with inherent risk due to the potential for prescribed fire escape. An escape, or the sudden movement of a controlled fire outside of its intended burn area, can result in damage to native vegetation, property, infrastructure, and human life. As a result of this risk, BLSD only seeks to work with a contractor professionally trained in prescribed fire. At a bare minimum, BLSD will only utilize contractors with the following qualifications from the National Wildfire Coordinating Group (NWCG) for staff conducting a prescribed fire:

- S130, L180, S190- Qualifications for Wildland Firefighter Type II.

These NWCG courses ensure professional training on weather conditions that influence fire behavior and its spread, safe ignition patterns, effective fire line communication, and harm reduction (NWCG, Firefighter Type 2 2021). Potential contractors will also have Line Bosses and Burn Bosses who have years of experience planning and conducting prescribed fires in the state of WI in addition to other NWCG coursework. Any planned prescribed fire may also not take place without an approved burn plan. A burn plan includes the total acreage to be burned, documents fuel types and conditions, lists weather parameters for the intended burn, entails the ignition pattern, includes a smoke management plan, and lists assets to be protected. A burn plan must be reviewed and approved by a local fire department and requires notification to the fire department and WDNR on the day of ignition. A burn plan prepared by Heartland for the Study Area may be found in Appendix F – 2023 Heartland Burn Plan, Baumeister Parcel. Taken together, the potential risk of prescribed fire to the public and environment is reduced through professional training, experience of the contractor, the preparation of a burn plan, and local fire department review, approval and notification.

Finally, if BLSD does not engage in NR 40 and invasive species management, the prevalence of these species within the Study Area is expected to increase over time. Engaging in vegetation management ensures BLSD can reduce current levels of NR 40 and invasive species and address any novel invasive species introductions to the site before they begin to spread around the Study Area and offsite. It also reduces the competitive advantage of existing invasive species populations within the Study Area.

3.4 SW Grant Management Goals

Management Goal #1 Reduce Relative Cover of NR 40 and Invasive Species in the Study Area. *Target NR 40 and Invasive Species Percent Cover for Wetland Communities:*

- Reduce current populations of reed canary grass to 20% cover in wet meadow wetlands to follow 2020 baseline conditions. 10-15% cover of reed canary grass preferred.
- Reduce current populations of narrow leaf cattail to 10-15% cover in marsh wetlands and ditch margins to follow 2020 baseline conditions. 5% cover preferred.
- Reduce current populations of purple loosestrife and common reed onsite to background cover levels (0.5-1% cover).

This management goal will utilize an Integrated Pest Management Strategy (IPM) to target reed canary grass, narrow leaf cattail, purple loose strife, and common reed within the Study Area for three (3) full growing seasons- two calendar years in total. The IPM strategy shall rely on various objectives including herbicide treatments (spot spraying and/or targeted boom spraying), mowing, seed head clipping, at least one (1) prescribed fire event, and native seeding. IPM strategies shall be seasonally timed based on plant morphology and treatment effectiveness. For example, reed canary grass will typically bolt earlier in Spring than native graminoids. As a result, Spring herbicide treatments of reed canary have the benefit of limiting non-target plant herbicide damage due to the slower emergence of native vegetation.

Additionally, conducting mowing when plants are fruiting but not in seed (like late Spring for reed canary) can limit seed sourcing for next year's growing season. Similarly, if small and isolated populations of reed canary or purple loosestrife are observed and have gone to seed, seed-head clipping will be utilized. This strategy removes all seed sourcing from a plant population and is most effective on small, localized populations due to the labor and time investment. Mowing and seedhead clipping also has the added benefit of reducing herbicide usage due to altering the management strategy.

Purple loosestrife will be targeted with herbicide treatments in mid-late summer (July-August) when the plant is typically in flower. This late treatment is timed to target the plant during its blooming period due to the ease of identification and the plant expending energy to promote its flowering- thus reducing its chances of recovery from herbicide injury due to limited carbohydrate reserves. Narrow leaf cattail will be treated during the summer

growing season when the plants are fully emerged. Common reed will be treated with herbicide in the late summer to early fall, as this is the optimal treatment window for the plant. Prescribed fire will be conducted preferably in spring or fall during the initial start or tail end of the growing season. This timing is associated with preferred weather conditions such as stronger prevailing winds and lower relative humidity. A fall burn also helps to clear vegetation from the western bank in preparation for native seeding. Objectives for Management Goal #1 are discussed in greater detail in Section 3.5.

3.5 High Priority Management Objectives – Goal #1

1. Low Volume Herbicide Spot Applications: Utilizing 4-gallon low volume backpack sprayers, licensed and certified herbicide applicators will treat individual plants within the Deep Marsh (6 acres), Shallow Marsh (6 acres), and large portions of the Wet Meadow (14.5 acres) totaling approximately 26.5 acres (Figure 6 – High Priority Herbicide Treatment Areas). Treatments are also proposed to be conducted along the SW-NE ditch corridor and within the margins of Spring Brook Creek. Herbicide applications are proposed be conducted in the 26.5-acre area twice a year for three (3) full growing seasons. Timing of herbicide treatments shall occur once in the Spring (May-June) and once in late Summer (July-September). Timing shall coincide with early emergence of reed canary grass and late season treatment of purple loosestrife and common reed.

Primary targets include narrow leaf cattail, reed canary grass, common reed, and purple loosestrife. Secondary targets consist of NR 40 listed common buckthorn (*Rhamnus cathartica*), and aggressive natives including: Box Elder saplings (*Acer negundo*), Giant Ragweed (*Ambrosia trifida*), and Stinging Nettle (*Urtica dioca*). Aggressive native species are proposed to be managed concurrently with NR 40 species and reed canary, but they will not be managed under WDNR grant funding should invasive plant management funding be awarded. If isolated and localized populations of invasive species are observed to have gone to seed, seedhead clipping shall occur simultaneously during these low volume herbicide spot applications.

2. UTV/ATV Pistol and Boomspray: Using a boom sprayer or pistol sprayer mounted to an ATV or UTV, a higher volume of herbicide is proposed to be applied to areas where larger populations of narrow leaf cattail or reed canary grass are present. This includes the south-central portion of the wet meadow (7.25 acres) and the southwest to northeast stream corridor edge (approximately 2 acres). A 2-acre portion of the tallgrass prairie shall also be simultaneously treated during the reed canary boomspray treatment events. Pistol and

boomspray applications will be conducted in the treatment areas twice a year for three (3) full growing seasons, or until invasive species monocultures have been reduced to a more manageable population by other treatment methods.

The primary species of concern in the tallgrass prairie include reed canary grass and NR 40 listed garlic mustard. Secondary targets include giant ragweed, and giant burdock (*Arctium minus*). Giant ragweed and burdock are proposed to be managed separately from any potential invasive plant management grant funding. Timing of herbicide treatments are proposed to occur once in the Spring (May-June) and once in late Summer (July-September) during the low volume herbicide application treatment events. Timing shall coincide with the early emergence of reed canary grass and late season treatment periods of purple loosestrife and common reed. Proportionally, proposed upland management areas utilizing a UTV/ATV pistol or boomspray only amount to approximately 1% of the proposed entire wetland treatment area of 26.5 acres- leaving more than 99% of the proposed treatment area in wetland habitats.

3. Maintenance Mowing: Using one (1) mower and operator, a contractor shall conduct one (1) mowing event in the late Spring each year for three (3) growing seasons. Primary targets will be large populations of reed canary grass to minimize seed formation for the upcoming growing season. Secondary mowing targets will be the southern property edge to limit reed canary, stinging nettle, and giant ragweed (2.75 acres) as well as portions of the tallgrass prairie (2 acres).

4. Prescribed Fire: A contractor will conduct at least one (1) prescribed fire event which will be timed pending on site conditions. Based on the timing of native seeding, the preferred burn window is fall. A Burn Plan for the Study Area has been prepared by Heartland to accompany this management plan (Appendix H) and includes the following:

- Listing of contacts associated with the burn planning, internal and external approvals, and burn execution.
- Reference to any required regulatory permits (issuing agency, permit number, and expiration date) in addition to procurement of permits on BLSD's behalf.
- Site-specific information including location description and summary of Site conditions.
- Burn-specific requirements, such as regulatory (permit) conditions and/or other approvals, Site-specific safety; burn resources (staff, equipment, PPE, signage); pre- and post-burn notifications list; burn execution; acceptable weather parameters;

burn objective; plans pertaining to hazard management, communications, ignition (firing plan), holding, and extinguishment techniques, lookout, contingencies, emergency response, and smoke management; air quality parameters; and smoke management plan with reference to the Wisconsin Smoke Management Best Management Practices for Prescribed Burns (SMBMP).

- An overview map depicting the Site relative to surrounding areas.
- A close-up view of Site overlain on a recent aerial photograph. This will include proposed burn unit(s), fire breaks, Site hazards, safety zones / muster point, adjacent smoke sensitive areas, water sources, and contiguous / potentially receptive fuels.
- A map with the route to the nearest emergency room or urgent care facility from the Project area.
- Reference to local ordinance, fire prevention and safety codes, etc.
- Technical review by the designated Burn Boss.

A contractor will then conduct the burn when Site and weather parameters, per the burn prescription, are conducive to safely conduct a burn and meet the burn objectives. The target burn window is fall. Burn services will consist of the following:

- Install burn breaks as required by the Site-specific burn plan.
- Pre- and post-burn notifications to persons and agencies listed on the Site burn plan.
- Placement of “Prescribed Burn Ahead” signs on adjacent roads to alert people in the area.
- A burn crew along with supplies, tools, and equipment to complete the burn. The burn will consist of ignition, containment, and extinguishment.

5. Native Seeding: After the preferred fall prescribed fire event, native seed is proposed to be hand broadcasted or broadcasted via a UTV seeder in portions of the wet meadow where observed establishment of native species has been especially poor. Total proposed acreage of seeding will be assessed after vegetation management commences and current site conditions are evaluated. Utilizing a native seeding event gives a competitive advantage for native plant species to outcompete NR 40 and invasive species after they have been set back in population extent through management activities. Seeding in the fall after a prescribed fire event also clears vegetation and gives native seed an increased chance of contacting mineral substrate and establishing. Seeding during fall before the onset of winter may also enhance germination of some native sedge species through cold stratification (Budelsky & Galatowitsch, 2002). A proposed Sedge Meadow Seed Mix is proposed to be

seeded at 6lbs. per acre and selected species can be found in Table 4. All seed will be procured by a trusted distributor of local genotypes found in southern Wisconsin. Table 4 represents a complete list of potential species to be utilized for native re-seeding efforts. Final species lists will be determined based on observed cover of native forbs and graminoids, supplier availability, and project budget considerations.

Table 4. Proposed Sedge Meadow Seeding List

Wildflowers/Forbs

Scientific Name	Common Name	Oz/per Acre
Acorus calamus	Sweet Flag	0.50
Alisma subcordatum	Mud Plantain	1.25
Anemone canadensis	Meadow Anemone	0.75
Angelica atropurpurea	Great Angelica	1.50
Asclepias incarnata	Marsh (Red) Milkweed	2.50
Aster novae-angliae	New England Aster	0.25
Aster puniceus	Swamp Aster	0.50
Baptisia leucantha (alba)	White Wild Indigo	1.00
Bidens frondosa	Common Beggar's Tick	1.25
Cassia hebecarpa	Wild Senna	4.00
Eupatorium maculatum	Spotted Joe Pye Weed	0.50
Eupatorium perfoliatum	Boneset	0.25
Helenium autumnale	Sneezeweed	0.50
Helianthus giganteus	Tall Sunflower	0.25
Helianthus grosseserratus	Sawtooth Sunflower	0.50
Hypericum pyramidatum	Great St. John's Wort	0.25
Iris virginica shrevei	Southern Blue Flag Iris	4.00
Liatris spicata	Marsh Blazing Star	1.00
Lobelia cardinalis	Cardinal Flower	0.50
Lobelia siphilitica	Great Blue Lobelia	0.25

Lycopus americanus	Water Horehound	0.25
Napaea dioica	Glade Mallow	4.00
Penthorum sedoides	Ditch Stonecrop	0.05
Physostegia virginiana	Obedient Plant	0.50
Pycnanthemum virginianum	Mountain Mint	0.25
Rudbeckia hirta	Black-Eyed Susan	1.00
Rudbeckia laciniata	Wild Golden Glow	1.50
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	0.75
Sagittaria latifolia	Common Arrowhead	1.25
Silphium perfoliatum	Cup Plant	3.00
Silphium terebinthinaceum	Prairie Dock	4.00
Solidago graminifolia	Grass-Leaved Goldenrod	0.10
Solidago ohioensis	Ohio Goldenrod	0.25
Solidago riddellii	Riddell's Goldenrod	1.00
Sparganium eurycarpum	Great Bur Reed	6.00
Thalictrum dasycarpum	Purple Meadow Rue	1.00
Verbena hastata	Blue Vervain	0.25
Vernonia fasciculata	Ironweed	0.50

Grasses, Sedges, & Rushes

Scientific Name	Common Name	Oz / Per Acre
Andropogon gerardii	Big Bluestem	8.00
Bromus ciliates	Fringed Brome	16.00
Calamagrostis canadensis	Blue Joint Grass	0.75
Carex bebbii	Bebb's Oval Sedge	0.50
Carex bicknellii	Copper-Shouldered Oval Sedge	1.00
Carex comosa	Bristly Sedge	1.00
Carex crinita	Fringed Sedge	0.50

Carex hystericina	Porcupine Sedge	0.25
Carex lacustris	Common Lake Sedge	0.50
Carex sprengelii	Long-Beaked Sedge	0.25
Carex stipata	Common Fox Sedge	0.50
Carex stricta	Tussock Sedge	0.25
Carex vulpinoidea	Brown Fox Sedge	0.25
Glyceria canadensis	Rattlesnake Grass	1.00
Glyceria grandis	Reed Manna Grass	1.50
Glyceria striata	Fowl Manna Grass	1.00
Juncus dudleyi	Dudley's Rush	0.10
Juncus tenuis	Path Rush	0.10
Juncus torreyi	Torrey's Rush	0.10
Leersia oryzoides	Rice Cut Grass	4.00
Panicum virgatum	Switchgrass	4.00
Scirpus acutus	Hard-Stem Bulrush	2.00
Scirpus atrovirens	Dark-Green Bulrush	0.20
Scirpus cyperinus	Wool Grass	0.10
Scirpus Validus	Great Bulrush	1.00
Spartina pectinata	Prairie Cordgrass	4.00

4.0 Alternative Analysis

In the preparation of finding the optimal management plan, alternative analyses were considered for the management goal. These alternatives assessed the impact on the public, the need for vegetation management, and the overall success rate of each proposal. After consideration of all alternatives, the proposed invasive pest management strategy was considered to be the best strategy given the site's needs and the objectives of BLSD.

Management Goal #1 – Invasive Plant Management

Alternative #1: *No Active Invasive Species Management.*

The Study Area has seen an increase in the relative cover of NR 40 and invasive species since invasive vegetation assessments have been conducted from the period of 2007-2020 (Table 3). A gap in invasive vegetation management occurred from approximately 2012-2016 and an influx of reed canary grass, purple loosestrife, narrow leaf cattail, and common reed populations was observed. BLSD must comply with the land covenants present on site, which includes the invasive plant management to keep the site in a natural state (defined by the baseline assessment performed by Heartland in Appendix A).

Conclusion- Due to the increase of invasive species populations on site, no management would leave the site in a transition from its "natural state". Relative cover of the NR 40 and invasive species would increase, and native flora populations would decline as a result. This would lead to a degradation of the floristic and functional quality of wetlands on site. Thus, no management was considered a non-viable alternative.

Alternative #1: *Hand Control/Manual Control.*

Hand control/manual control removes flowers, fruits, or seed heads from invasive plants to limit seed production. This technique is utilized for various invasive species including garlic mustard, purple loosestrife, and reed canary grass. For these plants, hand or manual control typically consists of pulling plants in their flowering/fruiting stages or clipping seed heads with hand trimmers during the same phenology period. However, this technique is best suited for areas of localized populations which are smaller in land area. Removing seed heads from each plant within the Study Area would not be feasible given the time it would take to individually clip and collect seed or fruiting structures, the size of the Study Area (45.71 acres), and the extent of NR 40 and invasive species populations.

BLSD did consider utilizing volunteer work parties on the property to assist with the vegetation management. However, if BLSD were to utilize a volunteer workforce, the coordination and training required would slow treatments within the Study Area. Herbicide treatments, maintenance mowing, native seeding, and prescribed fire are management techniques which can cover far more area in a shorter amount of time- thus saving overall project budget while managing more area.

Conclusion- An IPM strategy of herbicide treatments, maintenance mowing, native seeding, and prescribed fire has the benefit of reducing the extent of invasive populations quicker, targeting more area, relies on trained ecological professionals, and leaves more opportunities for adaptive plant management. In addition, the proposed management strategy does leave room to utilize hand control/manual labor where applicable (i.e. small and localized invasive populations in flower or fruit). Given the benefits of an IPM strategy, solely relying on hand control/ manual control was deemed a nonviable option.

Alternative #1: *No Herbicide, Reliance on Maintenance Mowing, Native Seeding, and Prescribed Fire.*

This alternative would have forgone herbicide altogether in favor of maintenance mowing events and a prescribed fire. While more area would be managed with maintenance mowing and prescribed fire when compared with hand/manual control, numerous consequences for effective long-term management result with the absence of herbicide. Mowing can be effective at limiting seed production for the following growing season, but it rarely kills invasive perennial plants. In contrast prescribed fire can kill perennial plants, but it is far more variable in its effectiveness. Burn intensity, or a measure of the energy produced by a fire, can vary widely in a burn unit due to fuel load differences, microtopography, and soil conditions. Increased burn intensity is most effective at killing perennial plants, but due to small variations in a site, areas may not experience high burn intensity or coverage. This can result in invasive populations being set back or reduced in extent for a short time but ultimately rebounding in population size later. Maintenance mowing and prescribed fire may also not set back NR 40 and invasive species populations enough, which could have deleterious outcomes for a native seeding event. If these plant populations are not sufficiently reduced, they tend to outcompete native seedlings by limiting their access to light, water, and mineral resources.

Herbicides offer an effective way to locally target invasive plant populations and ensure a higher kill rate. Herbicide treatments coupled with mowings, prescribed fire, and native

seeding has proven to be a highly beneficial native restoration and IPM strategy in WI. The benefits of utilizing herbicide are related to more guaranteed and fast acting kill rates.

Conclusion- Herbicides are the most effective management tool at offering more guaranteed kill rates which can reduce invasive plant populations faster. Using mowing and prescribed fire alone would be beneficial for limiting seed production but not for eradicating invasive species and managing the Study Area for a natural state. Thus, reliance on mowing and prescribed fire was deemed a nonviable option.

4.1 Adaptive Vegetation Management

With any native restoration project involving invasive species management, adaptive strategies are crucial to the success of management control efforts. Adaptive management provides flexibility and refinement of a management plan when unanticipated issues or novel site conditions are present. Typically, unanticipated issues or site conditions following the commencement of restoration and invasive species management include novel invasive species populations observed for the first time, higher levels of relative cover of a rare or sensitive native species, higher population levels of a previously observed invasive species, drought conditions, and flooding conditions. These observations often result in a change of management tactics to address the changes onsite.

As the proposed management actions offer a combination of maintenance mowing, herbicide applications (using two application techniques), native seeding, and prescribed fire, this leaves the contractor with many options to adapt to onsite conditions. Four (4) common scenarios requiring adaptive management and suggested adaptive management strategies are outlined below. If field observations during a growing season necessitate a management plan recommendation adjustment, a section of the annual report (see Section 5.4) will be written and prepared to document the unanticipated management issue that needs to be addressed, the extent of the problem, and recommended adaptive strategies to mitigate the risk.

<u>Observation of Novel NR 40 or Invasive Plant Species</u>

- Survey the site for the invasive species. Develop a spatial understanding of population size, relative cover, and localized concentrations. Use this knowledge to develop a 1–2-year management strategy.

- Depending on NR40 status and ecological threat to the site, re-prioritize the new invasive species to be the principal target. Change herbicides and/or herbicide concentrations to offer more effective kill rates.
- Alter herbicide application method. If large populations are present, devote more management time to UTV/ATV boomspray over low volume backpack applications.
- Alter mowing schedule to limit seed sourcing of the new invasive species depending on the flowering or fruiting stage of the plant.
- Alter burn schedule (i.e. Spring instead of fall) to target the new invasive species when it is first emerging and is more vulnerable to burn injury.
- Alter herbicide treatment schedule to target the new invasive species when it is first emerging or is in its flowering/fruiting stage and is more vulnerable to herbicide injury.

Observation of High Levels Rare/Sensitive Native Species

- Alter burn schedule to implement a burn when the plant is not sensitive to fire. This may mean waiting until the fall to burn when a spring burn was preferred.
- Change herbicides to utilize those that decrease the potential for damage to the rare plant. For example, certain herbicides are broadleaf specific and will not injure graminoids when properly mixed and applied at label usage rates. Using broadleaf specific herbicides in areas with high concentrations of a native rare or sensitive graminoid would be recommended.
- Alter the reliance on low volume back-pack spraying in certain areas. This will limit the use of wheeled machines (such as an ATV/UTV) in favor of foot traffic preserving the sensitive area.

Observation of High Levels of Previously Recorded Invasive Species

- Shift management priorities to target the invasive species depending on its ecological threat to the treatment area.
- Adjust herbicide label rates to use an application rate more suited for the particular invasive species.
- Alter mowing or prescribed burning schedules to target the invasive when it is most vulnerable or before it sets seed to limit further spread within the Study Area.
- Depending on the extent of population sizes, rely more on high volume boomspray applications until populations are reduced in extent. After, target the species with low volume backpack spot applications.

Drought or Flooding Conditions

- Wait on a prescribed fire until the following year if a prolonged drought is present. A prescribed burn in prolonged drought may lead to deleterious effects on soil, native plant populations, and can increase the risk of high fire behavior and chance of a burn escape.
- If flooding or heavily saturated soils are present, rely more on low volume spot herbicide applications. This will ensure rutting from vehicle traffic is limited which could have deleterious impacts to the soil or native plant vegetation.
- Adjust herbicide rates due to drought. Slightly higher active ingredient concentrations may be needed as plants have slower metabolic activity. As a result, water absorption is slower which could reduce an herbicide's effectiveness.

5.0 Implementation

5.1 Key Deliverables

The key deliverables for a three-year management schedule are as follows:

Year 1

1. (2) low volume herbicide spot applications.
2. (2) ATV/UTV boomspray, pistol spray applications.
3. (1) maintenance mowing event.
4. (1) Prescribed fire event.
5. (1) native seeding event.
6. (1) annual report documenting herbicide applications, mowings, prescribed fire, general site conditions, and adaptive management recommendations. See Section 5.2 – Tracking Progress for more information.

Year 2

1. (2) low volume herbicide spot applications.
2. (2) ATV/UTV boomspray, pistol spray applications.
3. (2) maintenance mowing event.
4. (1) annual report documenting herbicide applications, mowings, prescribed fire, conditions of the west stream bank post stabilization work, general site conditions,

and adaptive management recommendations. See Section 5.2 – Tracking Progress for more information.

Year 3

5. (2) low volume herbicide spot applications.
6. (2) ATV/UTV boomspray, pistol spray applications.
7. (1) maintenance mowing event.
8. (1) annual report documenting herbicide applications, mowings, prescribed fire, conditions of the west stream bank post stabilization work, general site conditions, and adaptive management recommendations. See Section 5.2 – Tracking Progress for more information.

5.2 Technical, Financial, and Capacity Needs

As an organization, BLSD lacks the logistic, expertise, and technical capacities to implement a multi-year management strategy of the Study Area involving NR 40 and invasive species control. The current logistics of the proposed management actions fall outside of the capabilities of BLSD, despite the management of invasive species, preservation of native wetland habitat, and the preservation of water resources within the lake watershed being their top priorities. Given this realization, BLSD seeks financial assistance to implement the proposed management actions.

Since 2019, Heartland has assisted BLSD through the permit process of a proposed restoration project of Spring Brook Creek, assessed the vegetative baseline conditions, researched grant funding opportunities, and built relationships with various entities including NRCS, WDNR, and USACE. Heartland possesses intimate knowledge of the site, its challenges, and BLSD's capacities. As a cost-containment strategy, BLSD seeks to partner with Heartland Ecological Group in order to implement the vegetation management, annual reporting, and site monitoring as part of the management recommendation implementation. Heartland has a multi-year working relationship with BLSD and their intimate knowledge of the site puts them in a unique position when compared with other contractors. Heartland is positioned to respond and adapt to local site condition changes more effectively based on their experience with the site.

5.3 Implementation Timeline

Recommended management actions are proposed to take a total of (2) years of active management with 2024 marking the proposed beginning of the management schedule. This results in a total of three (3) growing seasons receiving management. The proposed timeline from 2024-2026 of management activities is detailed in Table 6. Total projected costs for the implementation of the vegetation management, including all annual reporting and (1) timed meander survey, are between $84,900 and $105,000. The overall cost is an estimate, and vegetation management cost may be updated to reflect current contractor hourly rates and site conditions. Given present site conditions, occurrence and/or timing of events may change given management priorities.

Table 6. Proposed Implementation Timeline and Projected Costs (Vegetation Management Total Projected Cost: $84,900 - $125,000).

Month and Year	Key Deliverable	Proposed Implementor	Projected Cost	Notes
May-June 2024	Spot Spray Applications	Heartland Ecological Group	$8,950 - $12,000	*Proposed crew for 2 days*
May-June 2024	Boomspray Applications	Heartland Ecological Group		
May-June 2024	Maintenance Mowing	Heartland Ecological Group	$3,900 -$4,500	*Proposed 1 operator for 1-2 days*
July-August 2024	Spot Spray Applications	Heartland Ecological Group	$8,950 -$12,000	*Proposed crew for 2 days*
July-August 2024	Boomspray Applications	Heartland Ecological Group		
September-October 2024	Prescribed Fire	Heartland Ecological Group	$13,000	*See Appendix H - Heartland Burn Plan*
September – October 2024	Native Sedge Meadow Seeding	Heartland Ecological Group	$5,000-$15,000	*Acreage to be proposed pending site conditions.*
Jan. 31, 2025	1st. Annual report of Growing Season Conditions	Heartland Ecological Group	$500 -$1,000	
May-June 2025	Spot Spray Applications	Heartland Ecological Group	$9,150 -$12,000	*Proposed crew for 2 days*
May-June 2025	Boomspray Applications	Heartland Ecological Group		
July-August 2025	Spot Spray Applications	Heartland Ecological Group	$9,150 -$12,000	*Proposed crew for 2 days*

July-August 2025	Boomspray Applications	Heartland Ecological Group		
July-August 2025	Maintenance Mowing	Heartland Ecological Group	$4,000 - $5,000	
Jan. 31, 2025	2nd. Annual report of Growing Season Conditions	Heartland Ecological Group	$500 -$1,000	
May-June 2026	Spot Spray Applications	Heartland Ecological Group	$9,350 -$12,000	*Proposed crew for 2 days*
May-June 2026	Boomspray Applications	Heartland Ecological Group		
May-June 2026	Timed Meander Survey	Heartland Ecological Group	$2,000	*Timed Meander survey as part of documentation of baseline conditions post vegetation management initiatives.*
July-August 2026	Spot Spray Applications	Heartland Ecological Group	$9,350 - $12,000	*Proposed crew for 2 days*
July-August 2026	Boomspray Applications	Heartland Ecological Group		
July-August 2026	Maintenance Mowing	Heartland Ecological Group	$4,100 - $5,000	
Jan. 31, 2026	Final report of Growing Season Conditions and Timed Meander Survey	Heartland Ecological Group	$1,500	

5.4 Tracking Progress & Updating the Management Plan

In order to ensure the timely completion of deliverables, annual reports shall be submitted following each growing season (see Table 6 for deliverable schedule). The annual report will summarize herbicide applications, document herbicide logs for the year, summarize mowing events, summarize prescribed fire events, and describe onsite conditions. The annual reports shall serve as the basis for tracking progress and assessing present NR40 and invasive threat levels in preparation of the upcoming growing season. The annual report shall also be used for updating the management plan should alternative management recommendations be proposed based on invasive species prevalence, abiotic (i.e. drought or flooding) conditions, or any other unpredicted event that requires management. The annual report will also include a summary of inspections after native seeding events to document new emergence of native populations in seeded areas. These will include a summary of findings and compiled onsite photos.

Lastly, in the early summer of 2026, Heartland proposes to conduct a WDNR Timed Meander Survey for wetland floristic quality and summarize baseline conditions during the final year of active NR 40 and invasive species management. The Timed meander survey method first identifies assessment areas or areas of relatively homogenous vegetation prior to sampling. A start location within the main body of each assessment area and away from transitional areas and/or anthropogenic disturbance is selected. The surveyor then starts a 30-minute timer, subdivided into 5-minute intervals, and begins recording observed vegetation to the species level while walking a meandering path through the assessment area. The timer is paused when consulting field guides and/or dichotomous keys to identify plant species. Searches are generally stopped: 1. If after 30 minutes of search time, one or no new species is found during the most recent 5-minute interval, or 2. If after 30 minutes of search time, the number of species observed in the most recent 5 minute interval is less than 5% of the running total of recorded species. Typically, 30-minute search times are sufficient for documenting an assessment area. Once the species list is complete, the surveyor assigns each species a percent cover based on an ocular estimate of the percent of the assessment area covered by the canopy of that species. Wetland communities are then assessed based on Eggers and Reed classifications (Eggers and Reed, 2015).

Assessment areas shall mimic those present in Heartland's 2021 vegetation assessment. This final report will document the final progress made onsite and will propose any future management actions given the results of the survey.

5.5 Summary of 21-Day Public Comment Period

This management plan was posted publicly for the solicitation of comments for 21 days (August 24th – September 14th, 2023). The public was alerted to the posting of this management plan at a public monthly meeting of the BLSD on August 24th. The plan was subsequently posted on the BLSD website the same day for review. If the public wished to pose a comment, BLSD directed those interested to email Harvey Kandler (BLSD President) or Keith Phelps (Heartland Plan Preparer). Despite the posting of the plan publicly, no public comments were received during the 21-day comment period. Continued interaction and input with the public will be crucial for the long-term success of the vegetation management plan. The vegetation management plan will continue to be publicly available, with new versions of the plan re-published should updates be made, to promote transparency of intended management actions on the site.

6.0 Conclusion

Heartland is pleased to present this Management Plan on behalf of BLSD for the long-term management of the Baumeister Site. The proposed management strategies are two pronged in their approach and seek to address the reduction of invasive species populations onsite and the re-sloping and stabilization of the west bank of Spring Brook Creek within the Baumeister site. The implementation of these holistic management recommendations will provide for the continued benefit to the Lake Bohner watershed by preserving native habitat, protecting water resources, and limiting the spread of invasive species in the watershed.

6.0 Bibliography

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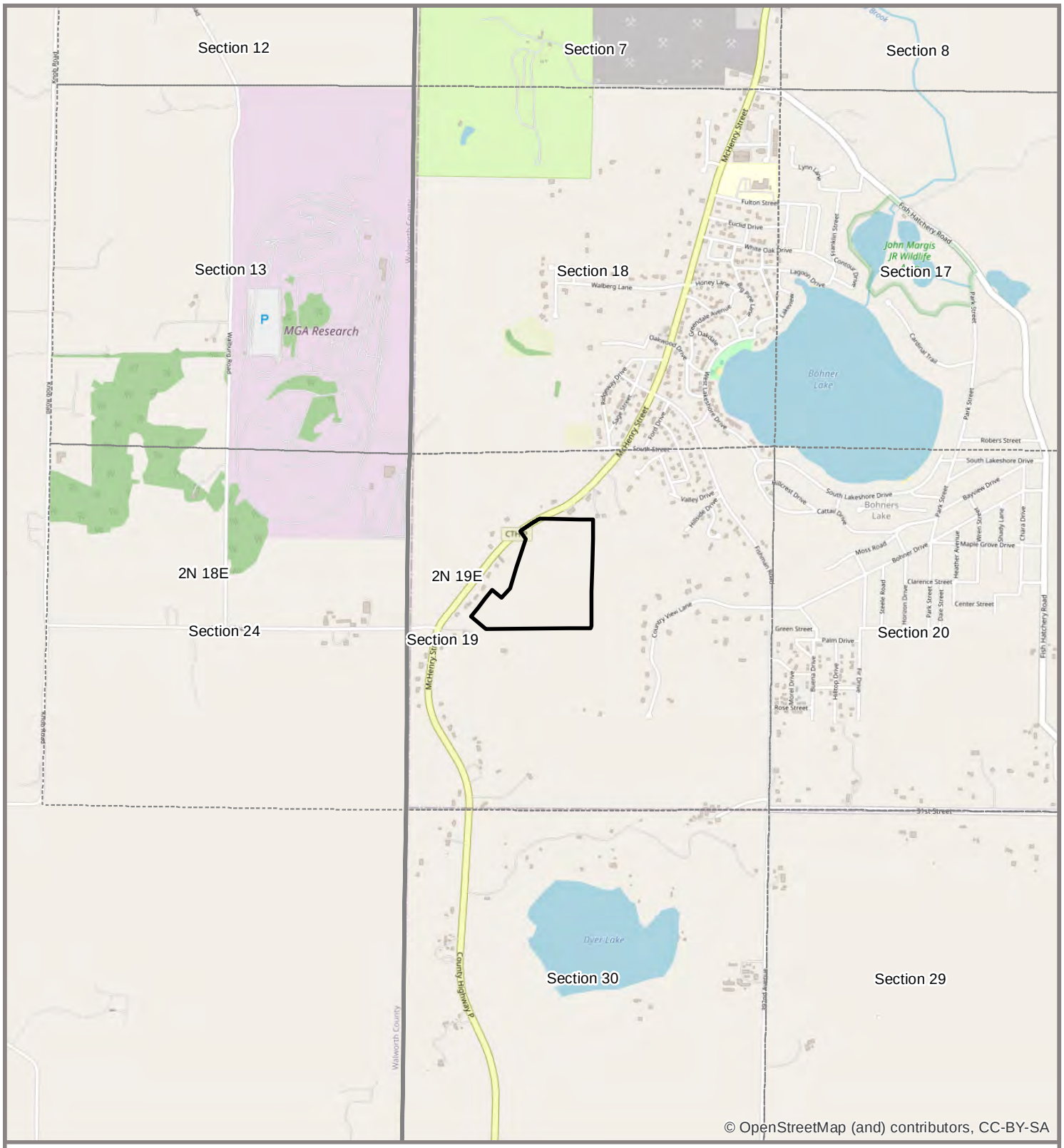
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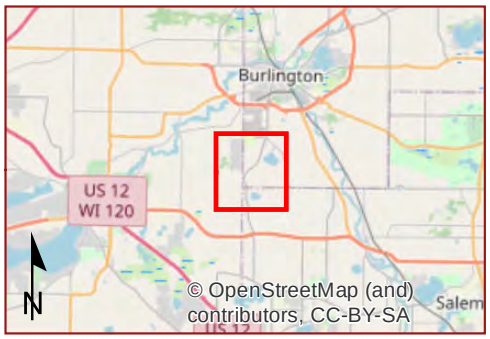
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Figure 1 – Project Location Map





Mitigation Site Area

Township

Section

0 1,000 2,000 Ft

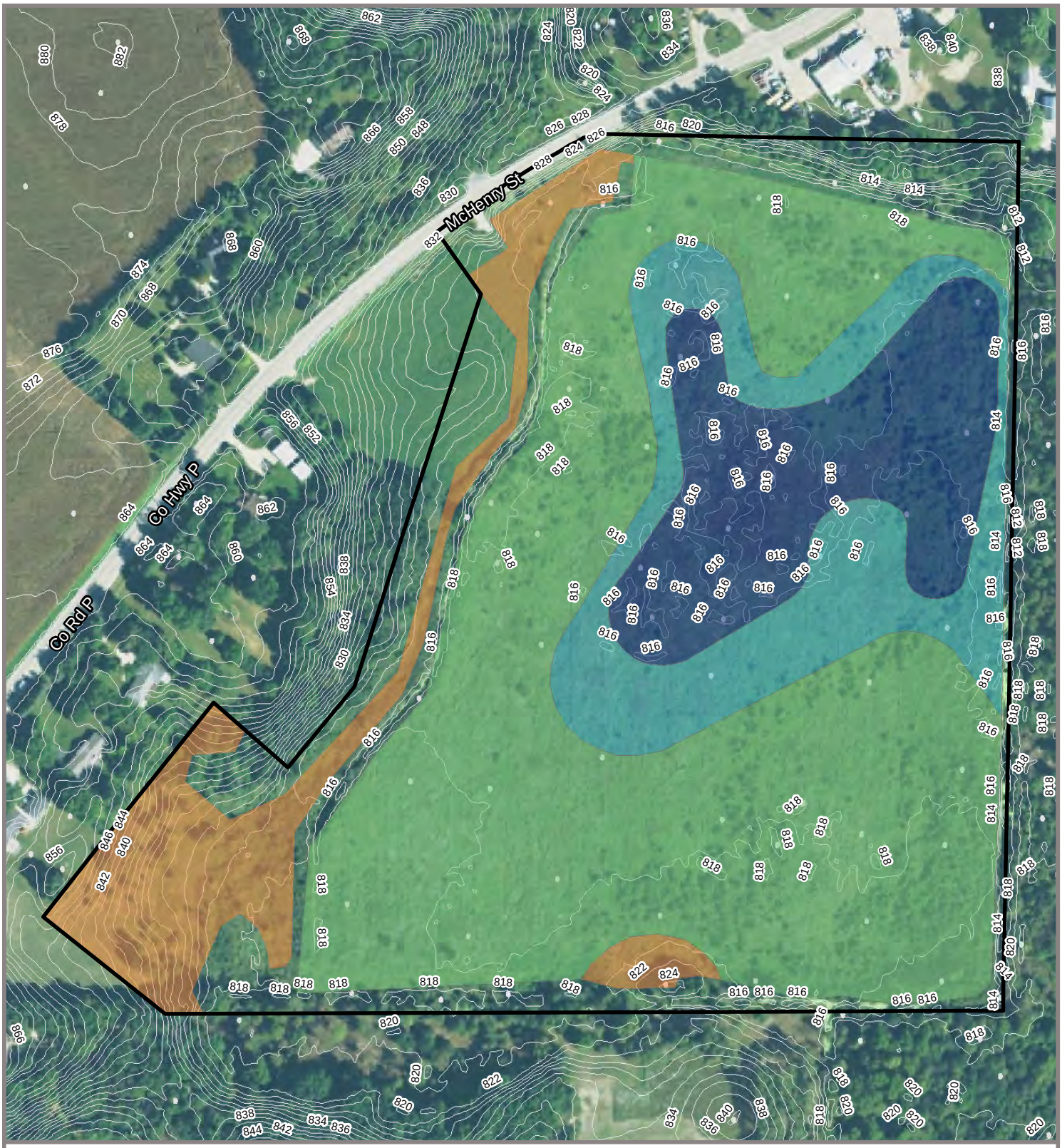
Heartland ECOLOGICAL GROUP INC

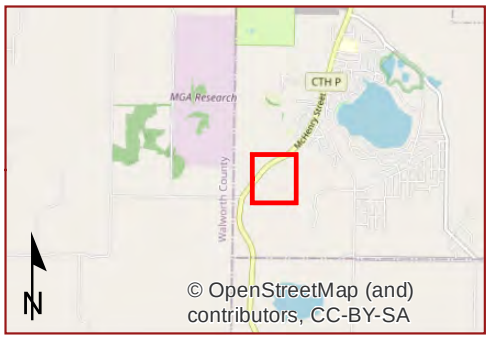
Baumeister Mitigation Site Location

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

OpenStreetMap Data: ESRI *11/11/2020*

Figure 2 – Baumeister Vegetation Communities





Mitigation Bank Area

Racine Co 2' Contours

0 125 250 Ft

Vegetative Communities

- Deep Marsh (6.09 ac)
- Shallow Marsh (6.15 ac)
- Wet Meadow (21.74 ac)
- Tallgrass Prairie (4.87 ac)

Heartland ECOLOGICAL GROUP INC

Vegetative Communities

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

2018 NAIP
Data: Racine Co, HEG *11/11/2020*

Figure 3 – Robert E. Lee 2017 Invasive Survey Map

Phalaris arundinacea 6

Phalaris arundinacea 1
Cirsium arvense 1

Phalaris arundinacea 5

Phalaris arundinacea 2

Urtica dioica 6
Allaria petiolata 1
Phalaris arundinacea 1
Ambrosia trifida 1

Phalaris arundinacea 2

Phalaris arundinacea 3

Ambrosia trifida 5 (mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 4

Phalaris arundinacea 5
Urtica dioica 4
Ambrosia trifida 4
Allaria petiolata 2

Phalaris arundinacea 2

Urtica dioica 5
Phalaris arundinacea 3
Ambrosia trifida 2
Allaria petiolata 2

Ambrosia trifida 5
Allaria petiolata 2
Phalaris arundinacea 2
Urtica dioica 1

Phalaris arundinacea 4
Urtica dioica 2
Ambrosia trifida 2
Allaria petiolata 1

Urtica dioica 5
Allaria petiolata 3
Ambrosia trifida 2
Phalaris arundinacea 2

Phalaris arundinacea 2

Allaria petiolata 4
Ambrosia trifida 3
Phalaris arundinacea 2

Urtica dioica 5
Allaria petiolata 3
Ambrosia trifida 2
Phalaris arundinacea 2

Ambrosia trifida 5 (Mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 4
Urtica dioica 3
Ambrosia trifida 2
Allaria petiolata 2

Phalaris arundinacea 1

Phalaris arundinacea 2

Ambrosia trifida 4 (mixed with willow (not mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 3
Urtica dioica 3
Allaria petiolata 2
Ambrosia trifida 2

Ambrosia trifida 5 (mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phragmites australis 1
Phalaris arundinacea 1

Phalaris arundinacea 2

Phalaris arundinacea 3
Allaria petiolata 2
Ambrosia trifida 2
Urtica dioica 2

Phalaris arundinacea 4
Urtica dioica 3
Allaria petiolata 2
Ambrosia trifida 2

Phalaris arundinacea 4
Urtica dioica 3
Ambrosia trifida 2
Allaria petiolata 2

Allaria petiolata 3
Phalaris arundinacea 2
Ambrosia trifida 2
Urtica dioica 2

Ambrosia trifida 5
Phalaris arundinacea 2
Allaria petiolata 1

Allaria petiolata 4

Ambrosia trifida 4
Phalaris arundinacea 3
Urtica dioica 3
Allaria petiolata 2

Ambrosia trifida 4
Phalaris arundinacea 3
Allaria petiolata 2
Urtica dioica 2

Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

FIGURE 2

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site - Invasive Species Monitoring & Maintenance
WISDOT Project #100-30-90
REL Project #15107067
Town of Burlington, Racine County, WI

DATE: 6/16/2017
15107067
DRAWN: PFO

Legend
Project Area (+/- 40.25 Acres)
Invasive Species Area Boundary (cover class indicated by number after species name)

0 60 120 Feet
N

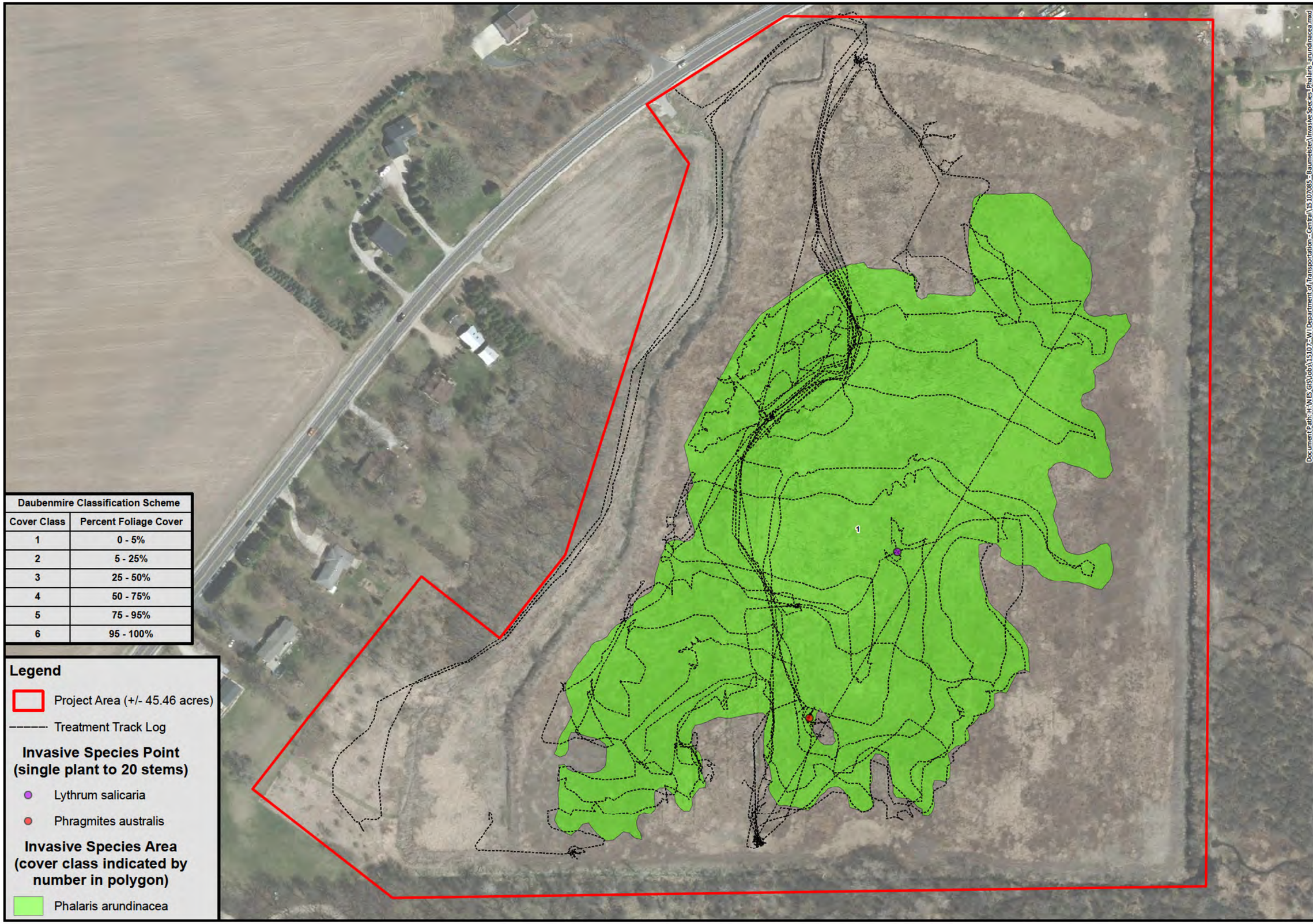
Source: Robert E. Lee & Associates, Inc.
ESRI, Racine County

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Robert E. Lee & Associates, Inc.
Engineering, Surveying and Environmental Services
1250 Centennial Centre Boulevard, Hobart, WI 54155
Phone: (920) 662-9641 FAX: (920) 662-9141
www.releeinc.com

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Figure 4 - Robert E. Lee 2018 Invasive Survey Map



Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

Project Area (+/- 45.46 acres)

Treatment Track Log

Invasive Species Point (single plant to 20 stems)

Lythrum salicaria

Phragmites australis

Invasive Species Area (cover class indicated by number in polygon)

Phalaris arundinacea

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 2
Invasive Species
Phalaris arundinacea, Lytrhum salicaria, & Phragmites australis

12/13/2018

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107085
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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N

0 160 Feet

Document Path: H:\WES GIS\Jobs\15107~WI Department of Transportation~Central\15107085~Baumeister\InvasiveSpecies_Phalaris_arundinacea.mxd

Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

Treatment Track Log

Project Area (+/- 45.46 acres)

Invasive Species Area (cover class indicated by number in polygon)

- Allaria petiolata (cover class 1)
- Allaria petiolata (cover class 2)
- Allaria petiolata (cover class 3)
- Allaria petiolata (cover class 4)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 3
Invasive Species
Allaria petiolata

12/11/2018

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107085
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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Document Path: H:\WES GIS\Jobs\15107-WI Department of Transportation - Central\15107085 - Baumeister\InvasiveSpecies_Allaria_petiolata.mxd

Figure 5 - Robert E. Lee 2019 Invasive Survey Map

Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	1 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

- Project Area (+/- 45.46 acres)
- Trimble Treatment Tracks
- Garmin Treatment Tracks

Invasive Species Point (Single Plant to 20 Stems)

- Allaria petiolata

Invasive Species Area - All Unshaded Areas Equal <1% Cover)

- Allaria petiolata (cover class 1)
- Allaria petiolata (cover class 2)
- Allaria petiolata (cover class 3)
- Allaria petiolata (cover class 4)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 2
Invasive Species
Allaria petiolata

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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N

0 160 Feet

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Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	1 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

- Project Area (+/- 45.46 acres)
- Garmin Treatment Tracks
- Trimble Treatment Tracks

Invasive Species Point
(Single Plant to 20 Stems)

- Lythrum salicaria
- Phragmites australis

Cover Class

- Phalaris arundinacea (cover class 1)
- Phalaris arundinacea (cover class 3)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 3
Invasive Species
Phalaris arundinacea
Lythrum salicaria
Phragmites australis

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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N

0 170 Feet

Document Path: H:\WES GIS\Jobs\15107~WI Department of Transportation~Central\15107102~Baumeister 2019\InvasiveSpecies Phalaris arundinacea.mxd



Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 4
Upland Buffer Restoration

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

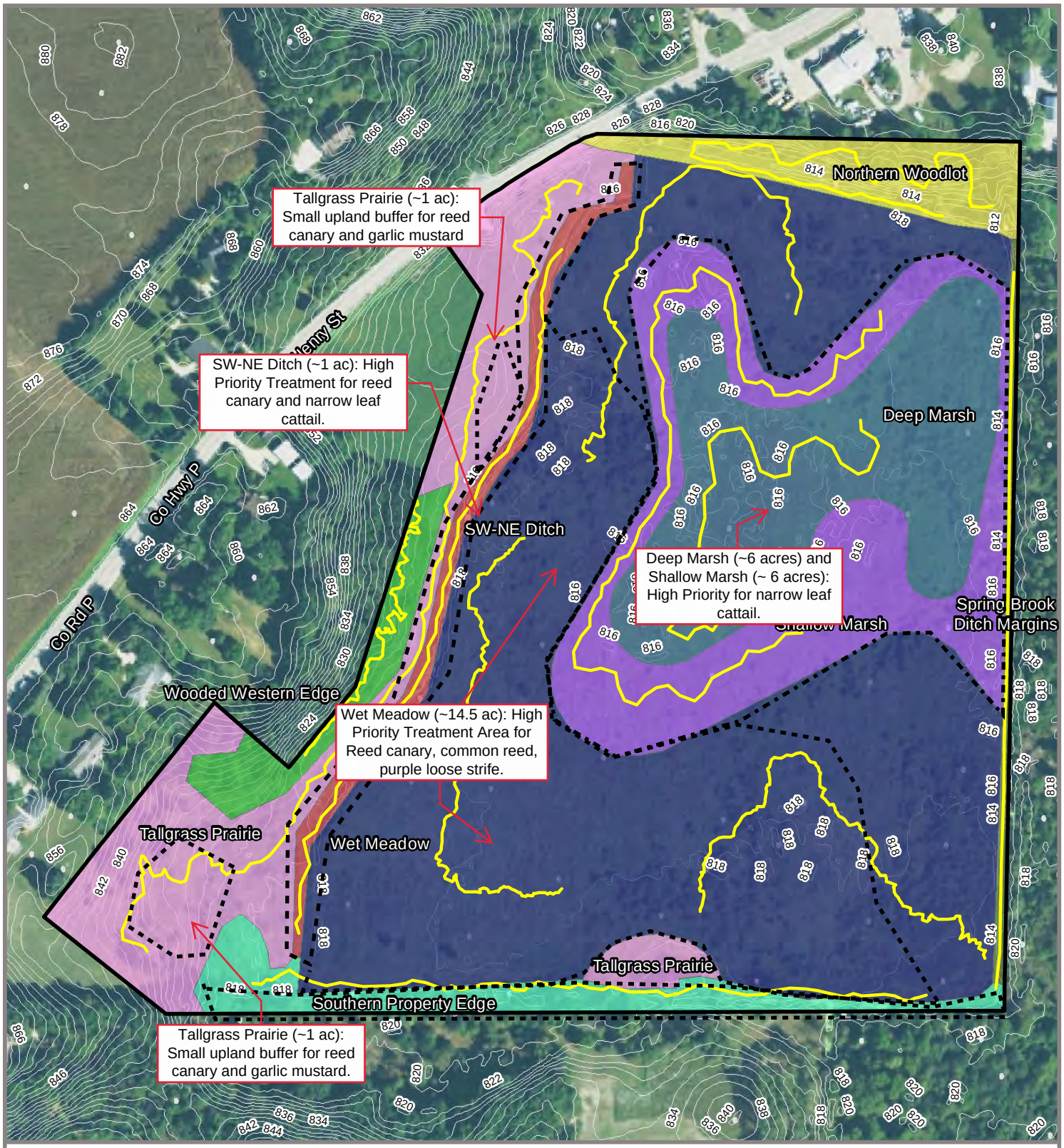
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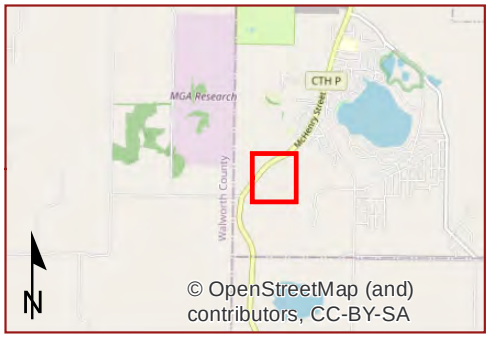
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0 170 Feet

Document Path: H:\WES GIS\Jobs\15107 - WI Department of Transportation - Central\15107102 - Baumeister\2019\UplandBufferRestoration.mxd

Figure 6 – High Priority Treatment Areas





Mitigation Site
Meander Survey Paths

Assessment Areas

- Deep Marsh
- Northern Woodlot
- SW-NE Ditch
- Shallow Marsh
- Southern Property Edge
- Spring Brook Ditch Margins
- Tallgrass Prairie
- Wet Meadow
- Wooded Western Edge

0 125 250 Ft

Heartland ECOLOGICAL GROUP INC

Vegetation Survey Assessment Areas

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

2018 NAIP
Data: Racine Co, HEG *11/11/2020*

Appendix A | 2020 Heartland Vegetation Survey and Summary

Heartland
ECOLOGICAL GROUP INC
506 Springdale Street, Mount Horeb, WI 53572

November 11, 2020

Mr. Harvey Kandler
Bohner's Lake Sanitary District
P.O. Box 280
Burlington, WI, 53105

RE: Vegetation Survey and Summary – Baumeister Wetland Mitigation Site, Town of Burlington, Racine County, Wisconsin

Dear Mr. Kandler:

Heartland Ecological Group, Inc. ("Heartland") completed a baseline vegetation survey on the Baumeister Wetland Mitigation Site on September 22, 2020 at the request of Bohner's Lake Sanitary District ("BLSD"). Fieldwork was completed by Scott Fuchs and Jason Behrends of Heartland Ecological Group, Inc. The 45.71-acre site (the "Study Area") lies approximately ¼ mile northeast of the intersection of County Trunk Highway (CTH) P / McHenry Street and Warren Road, in the northwest ¼ of Section 19, T2N, R19E, Town of Burlington, Dane County, Wisconsin (Attachment 1, Project Location Map). The purpose of the vegetation survey was to document the current state of vegetative communities within the mitigation site.

Background and Purpose

The Baumeister Wetland Mitigation Site was established in 2006 by the Wisconsin Department of Transportation (WisDOT) to achieve permittee-responsible compensatory wetland mitigation requirements. The site achieved its mitigation performance standards following the completion of the 2011 final monitoring report. It is Heartland's understanding that the BLSD is considering acquiring the mitigation site from WisDOT and this document serves as establishing and documenting the baseline vegetation conditions of the site as they currently stand. Based on coordination with the U.S. Army Corps of Engineers the site owner is required to comply with the existing conservation easement (with minor modifications) in perpetuity which includes maintaining the vegetation in the condition at the time of acquisition (Attachment 9 – Draft Conservation Easement). BLSD also requested that they receive management recommendations and cost estimates for performing vegetation management activities on-site.

Methods

Vegetative communities were surveyed utilizing a timed meander sampling protocol. This method first identifies assessment areas – areas of relatively homogenous vegetation prior to sampling. A start location within the main body of each assessment area and away from transitional areas and/or anthropogenic disturbance is selected. The surveyor then starts a 30-minute timer, subdivided into 5-minute intervals, and begins recording observed vegetation to the species level while walking a meandering path through the assessment area. The timer is paused when consulting field guides and/or dichotomous keys to identify plant species. Searches are generally stopped: 1. If after 30 minutes of search time, one or

no new species is found during the most recent 5 minute interval, or 2. If after 30 minutes of search time, the number of species observed in the most recent 5 minute interval is less than 5% of the running total of recorded species. Typically, 30-minute search times are sufficient for documenting an assessment area. Once the species list is complete, the surveyor assigns each species a percent cover based on an ocular estimate of the percent of the assessment area covered by the canopy of that species. This process was completed for each assessment area.

In the case of this site, the community areas developed during the site's planning phase (deep marsh, shallow marsh, wet meadow, and tallgrass prairie) were utilized as assessment areas (Attachment 2: Site Seeding/Establishment Plan). In addition, areas that were apparently unplanted or unmodified during the sites planning and implementation stages; woodlands along the site's western boundary, the southwest to northeast ditch that runs roughly parallel to the western site boundary, an approximately 75 foot wide strip along the southern boundary of the site, the Spring Brook ditch margins, and the northern wood lot, were identified and evaluated as assessment areas (Attachment 3: Assessment Areas and Meander Paths Map). The wet meadow area was sampled with three meanders due to its size (21.64 ac).

In addition to timed meander surveys, general observations and comments on the quality of vegetation, presence of invasive species, and deviations from expected vegetation were also recorded. These comments are summarized in the results section and presented on Attachment 4: Planted Communities and Observations Map.

It bears noting that the timed meander surveys were completed late in the growing season (late September). As a result, early blooming / early senescing species are likely under-reported in the survey data compared to their actual presence.

Results

A table summarizing the principal findings of the vegetation survey are presented in Table 1 below. Detailed results of species observed during the timed meander surveys, their respective percent covers, and other metrics are presented in Attachment 5: Timed Meander Survey Data. A summary of the vegetative quality, disturbance, presence of invasive species, and dominant species for each assessment area is also provided below. Representative photos of vegetation within each assessment area are presented in Attachment 6: Vegetation Survey Photolog.

Table 1. Summarized Timed Meander Survey Results

Assessment Area	# Total Species	# Native Species	# Non-Native / Invasive Species	Non-Native / Invasive Relative Cover	Weighted Mean C	Condition Category
Tallgrass Prairie	39	22	17	51%	0.5	N/A
S.W.-N.E. Ditch Corridor	25	19	6	36%	1.2	Very Poor

Wooded Western Edge	15	9	6	49%	2.2	N/A
S. Property Edge	31	18	13	39%	0.9	Very Poor
Wet Meadow #1	30	28	2	16%	2.9	Poor
Wet Meadow #2	35	33	2	3%	3.6	Fair
Wet Meadow #3	33	31	2	15%	3.4	Fair
Shallow Marsh	27	25	2	7%	3.8	Fair
Deep Marsh	16	15	1	8%	3.9	Fair
Spring Brook Ditch Margins	33	26	7	22%	1.5	Poor / Very Poor
Northern Woodlot	34	22	12	46%	1.5	N/A

Tallgrass Prairie Community

The tallgrass prairie portion of the mitigation site is generally in poor condition. The long skinny stretch of tallgrass prairie, west of the southwest – northeast running ditch could be classified more as a wet meadow than upland tallgrass prairie. This strip is utilized as an access lane to the southern portion of the site for vegetation management and appears to be somewhat regularly mowed. The main body of the tallgrass prairie area in the southwestern corner of the site is dominated by *Bromus inermis and Solidago canadensis.* Adjacent to the narrow driving lane, the tallgrass prairie area is dominated by *Arctium minus and Ambrosia trifida.* The northern portion of the main body of the tallgrass prairie community is invaded by *Rhus glabra* shrubs.

An approximately 1.18-acre portion of the site adjacent to the tallgrass prairie community was being encroached upon and utilized for agriculture. This area was replanted with an upland prairie seed mix in 2019. Since this area was planted with a similar seed mix to that of the remainder of the tallgrass prairie area, this replanted area was included within the tallgrass prairie meander. This portion of the community was dominated by weedy annual grasses including *Setaria faberi, Setaria pumila, Panicum dichotomiflorum,* and *Echinochloa crus-galli.*

Southwest to Northeast Running Ditch

This area is composed of an approximate 1-foot deep, 3-4 foot wide ditch and an approximately 25 foot wide corridor centered on the ditch. The ditch contained slowly flowing water and has a very mucky/silty bottom. This area does not appear to have been planted with additional native species during the site's establishment. The ditch corridor was dominated by *Phalaris arundinacea* and *Ambrosia trifida.* Some portions of the ditch corridor (~25%) were dominated by *Acer negundo and Rhamnus cathartica shrubs and trees.*

Wooded Western Edge

The strip of woodland along the western edge of the mitigation site property is approximately 1 acre in size and was not modified during the site's creation, according to the site establishment plans. This area consists of a disturbed upland hardwood forest. The tree stratum was dominated by *Quercus alba, Acer negundo, Acer saccharum, Quercus macrocarpa, and Carya ovata.* The shrub and groundlayer strata are heavily disturbed and are dominated by the invasive *Rhamus cathartica* and *Alliaria petiolata,* respectively.

Southern Property Line

The portion of the mitigation site within approximately 50 feet of the southern property boundary was not planted with a native seed mix during the sites establishment, according to the seeding plan. This area is regularly managed through mowing and spot herbicide treatment. Despite mowing and herbicide treatments, this area is dominated by weedy and/or invasive species. Dominant species included *Phalaris arundinacea, Urtica dioica, Setaria faberi, and Ambrosia trifida.*

Wet Meadow

The majority of the mitigation site consists of wet meadow (21.64 ac). Due to the size of the wet meadow area, three timed meander surveys were completed within it. Overall, the wet meadow portion of the site is in relatively good condition. The invasive species, *Phalaris arundinacea* is present with an average cover of approximately 20%, but was not overly dominant, except for a few isolated pockets. Some portions of the wet meadow area are transitioning into shrub carr (dominated by *Salix bebbiana and Cornus alba)* in the absence of fire and/or mowing management. Small isolated wetter pockets within the wet meadow area could better be described as shallow marsh than wet meadow. Wet meadow portions of the site were dominated by *Symphyotrichum puniceum, Leersia oryzoides, Solidago gigantea, Solidago canadensis, Symphyotrichum novae-angliae, and Phalaris arundinacea.*

Again, it should be noted that the timed meander surveys were completed late in the growing season. The percent cover of sedges, cool season grasses, and early season forbs are likely higher than reported here.

Shallow Marsh

Shallow marsh portions of the site contained 0-3 inches of standing water at the time of the vegetation survey. The shallow marsh area had a very low percent cover (5%) of invasive *Phalaris arundinacea*. Dominant species within the shallow marsh area included *Symphyotrichum puniceum, Scirpus cyperinus, Bolboshcoenus fluviatilis,Typha angustifolia, and Typha latifolia.*

Deep Marsh

Deep marsh portions of the site contained approximately 4-12 inches of standing water at the time of the vegetation survey. No invasive species were observed within the deep marsh community. Dominant species included *Sparganium eurycarpum, Bolboschoenus fluviatilis, Typha angustifolia,* and *Typha latifolia.*

Spring Brook Ditch Margins

The eastern boundary of the site is made up of a ditched portion of Spring Brook. Vegetation within approximately 20 feet of the edge of the ditch was recorded to document this area. The ditch margins were largely dominated by *Urtica dioica, Ambrosia trifida,* and *Phalaris arundinacea.* The approximately northern half of the ditch is bordered by shallow marsh and featured similar cover of that observed in the shallow marsh meander.

Northern Woodlot

The northern boundary and northeastern corner of the site contains woodland and was not modified during the site's establishment, according to the site establishment plans. This portion of the site consists of a degraded wooded slope with few native species present. The tree stratum was dominated by *Morus alba, Gleditsia triacanthos,* and *Acer negundo.* The shrub stratum was dominated by the invasive *Rhamnus cathartica* and *Lonicera maackii.* The groundlayer within the northern woodlot was dominated by the invasive *Alliaria petiolata and Hesperis matronalis* and low-quality/weedy *Urtica dioica, Ageratina altissima, Glechoma hederacea,* and *Arctium lappa.*

Discussion

Planted wetland communities within the mitigation site are generally of fair quality when measured against the condition category benchmarks outlined in the *Provisional wetland floristic quality benchmarks for wetland monitoring and assessment in Wisconsin* (Marti, A.M and T.W. Bernthal. 2019). The planted wet meadow, shallow marsh, and deep marsh assessment areas have weighted mean C values of 3.3 (average of three meanders), 3.8, and 3.9, respectively. These weighted mean C values fall within the *fair* condition category benchmarks for wetlands in the Southeast Wisconsin Till Plains and Central Corn Belt Plains region. For the purpose of comparison against these benchmarks, the wet meadow assessment area was compared against the *wet-mesic prairie* benchmark, and shallow and deep marsh assessment areas were compared against the *emergent marsh* benchmark. See Attachment 7: Wetland Community Condition Quality Benchmarks.

Unplanted wetland areas: the southwest – northeast ditch corridor, southern property edge, and Spring Brook ditch margins, were of poor or very poor quality. These assessment areas had weighted mean C values of 1.2, 0.9, and 1.5, respectively. For the purpose of comparison against benchmarks, the southwest – northeast ditch corridor and southern property edge were compared against the *wet-mesic prairie* benchmark. The Spring Brook ditch margin assessment area was compared against both *wet-mesic prairie* and *shallow marsh* benchmarks as some species from the adjacent planted wet meadow and shallow marsh had migrated into the ditch margins area.

The only planted upland community, the tallgrass prairie assessment area, had a mean C value of 0.5. Community condition category benchmarks were developed specifically for wetland communities, so this mean C value cannot be compared against existing benchmarks. However, a mean C value of 0.5 indicates that this assessment area is dominated by non-native and/or invasive species and has limited cover of native species. The data gathered during the timed meander survey indicates that this assessment area is dominated by weedy and/or invasive species, with little of the planted tallgrass prairie species contributing to the community.

The unplanted / unmodified upland woodlands within the site consisted of the wooded western edge and northern woodlot assessment areas. These assessment areas had mean C values of 2.2 and 1.5, respectively. While the tree stratum of the wooded western edge assessment area was dominated by native *Quercus alba,* the shrub and groundlayer strata were dominated by invasive *Rhamnus cathartica* and *Alliaria petiolata,* respectively. The tree strata of the northern wood lot was co-dominated by native *Gleditsia triacanthos,* and weedy/invasive *Morus alba* and *Acer negundo.* The shrub strata was dominated by invasive *Rhamnus cathartica* and *Lonicera maackii.* No particular species dominated the groundlayer of the northern woodlot, the groundlayer was co-dominated by a mix of invasive and/or low-quality vegetation. In summary, these woodlands are of poor quality, with the exception of the tree stratum in the wooded western edge assessment area.

It appears that vegetation management activities on the site following site establishment were focused primarily on the planted wetland communities. The unplanted wetland areas within the site are conspicuously of lower quality than the planted wetland areas. Similarly, the planted upland tallgrass prairie area is of low quality and dominated by invasive and/or weedy species.

Management Recommendations

As noted in the assessment of the current vegetative communities many of the plant communities are in poor to fair condition. This may be a result of insufficient overall management efforts in specific areas of the site and robust populations of non-native and invasive (NNI) species like reed canary grass (*Phalaris arundinacea*), giant ragweed (*Ambrosia trifida*), buckthorn (*Rhamnus spp.*), and boxelder (*Acer negundo)* that crowd out the desired native plant species. It is recommended that BLSD continues to complete vegetation management activities in order to maintain and/or improve existing site conditions.. These activities generally include targeted herbicide treatments, maintenance mowing, select over-seeding, prescribed fire, and woody brush removal.

Targeted herbicide treatments are an effective management technique to apply herbicide to target individuals and populations of invasive species. These treatments would be recommended to treat populations of reed canary grass, non-native thistles, teasle, buckthorn and other perennial and biennial NNI target species. All herbicides should be used in accordance with label directions and by a state certified Pesticide Applicator. Applications should occur at appropriate times and weather conditions to achieve effective control of target species. Spot treatments would be recommended to occur heavily in the short-term to achieve some control on rampant populations of reed canary grass and garlic mustard, among other species.

Appropriately timed maintenance mowing helps to reduce the populations of annual weed species, like giant ragweed, by preventing them from reaching maturity and producing seed. This technique is recommended to occur at least twice over a growing season on sites with high annual weed populations. Many annual plants will reach maturity a second time after an initial mowing treatment, therefore follow-up mowings are important to prevent seed formation. Mowing also applies stress to other non-desirable species and can help to invigorate some native species establishment.

Woody brush removal includes cutting and treating the stumps of undesirable woody vegetation. This can be used to effectively reduce populations of buckthorn, boxelder, white

mulberry, and undesirable willow species. This technique includes cutting and dropping/scattering the stems and using an appropriate herbicide to treat the stumps to prevent resprouting of the cut vegetation. Follow up foliar spot treatments are recommended in subsequent growing seasons in areas where woody brush is removed as seedlings of target species are likely to reestablish.

Heartland also recommends implementing a prescribed fire regime on the site. Prescribed fire helps in land and plant community management in a variety of ways; it helps cause stress and prevent growth of non-native and invasive species, it helps cycle nutrients into the soil, increases native plant diversity, and reduces the encroachment of successional woody shrub layers. It is recommended that a prescribed burn is completed throughout the site in two consecutive years and thereafter a burn cycle of every 3 – 5 years. This allows for heavy decrease in initial woody populations and heavily stresses non-native species over consecutive growing seasons which increase the effectiveness of the other management techniques, as well.

Heartland recommends utilizing these strategies to help gain control of invasive and non-desirable vegetation. The site management plan should be adaptive as the site changes and target priorities shift over time. Consistent management efforts will need to be completed regularly to achieve substantial improvements to the plant communities present on the mitigation site. If no management activities occur the mitigation site will likely become further degraded in wetland type, biodiversity, habitat suitability, and overall wetland function. Heartland recommends creating a long-term, site-specific Vegetation Management Plan for the site that meets the Client's management, function, and budget goals that can clearly delineate tasks and site priorities on a yearly basis.

Management Cost Estimates

Future management Heartland has prepared three different estimates for varying degrees of management effort for the mitigation site and an estimate for the implementation of a single prescribed burn. The Options include: Option 1 – Aggressive management, Option – Intermediate Management, and Option 3 – Targeted Management. For estimation purposes the full site acreage of 45.71 acres is used to determine yearly costs of Option 1, Option 2, and a prescribed burn; a work area of 20 acres was chosen to determine yearly costs for Option 3. These estimates are created to show the ranges and cost potential for different effort levels of management depending on budget and site goals. Over time with consistent and effective management, management costs often gradually decrease as less time will be needed to complete yearly management goals and NNI populations decrease.

Option 1: Aggressive Management – Would target all NNI species present on-site through a variety of the previously described techniques. This would lead to overall reductions in NNI populations and increased native diversity in the shortest period of time. Often efforts can be reduced dramatically after 1-3 years of aggressive management.

Option 2: Intermediate Management – Would target the most robust populations of NNI species and focus efforts in areas of highest NNI densities. Several management techniques could be used in this management method. Leads to reductions in the most robust populations of NNI species and increased native diversity. Some portions of the site or some NNI species may not be treated in this option. Often efforts will remain consistent for 3

years before reductions in effort can occur. This is due to untreated portions of the site or certain NNI populations going untreated initially.

Option 3: Targeted Management – Would target a pre-determined species or chosen area of the site to receive specified treatment efforts on a selected budget. This management method would likely use one appropriate management technique effective for the specific goal. This leads to overall reduction of NNI species targeted and increased native diversity in a specific work area. However, if not properly planned this technique can lead to degradation of plant communities with increased populations of non-target NNI species or untreated areas. For example, using this method and targeting reed canary grass for five straight years will lead to a reduction in reed canary grass populations, however populations of buckthorn might increase over this five-year period. This method of management can be effective to maintain site conditions when utilized in conjunction with a prepared Adaptive Vegetation Management Plan. Management costs would remain relatively static year to year.

RX Burn: Prescribed burns are highly variable in costs by individual contractors. This is often due to time required obtaining necessary permits, creating a burn plan, and in insurance liability costs for individual firms. These variables lead to a wide range in potential costs.

Management Option	Cost per acre	Total Estimate per year (Estimates are rounded to nearest $1,000)
Aggressive (45.71 ac)	$900 – $1,200	$41,000 – $55,000
Intermediate (45.71 ac)	$500 – $800	$23,000 - $37,000
Targeted (20 ac)	$400 – $800	$8,000 – $16,000
RX Burn (45.71 ac)	$200 - $500	$9,000 – $23,000

Stream Ditch Channel

Overall, the water levels in the stream appeared to be substantially higher than when the stream was observed during the WDOT Wetland Mitigation Site Erosion Problem Memorandum completed on 5/20/2015 by Ecological Research Partners, LLC. See Attachment 8: Spring Brook Photo Log for photographic evidence of current conditions of Spring Brook. The cause of the higher water levels is unknown; however, beaver activity is prevalent on-site. While no active damming activities were observed within the mitigation site boundaries, there is a dam present just off-site where Spring Brook heads east. Water levels appeared just as high on the downstream side of the dam so it is doubtful this is the only cause of water back-up, the dam can be seen in Photo #5. Photo #1 demonstrates how the water levels have drowned out many of the shrubs on the east bank. This woody debris provides good bank protection and leads to decreased flow velocities and increased sedimentation along that bank. The west bank is heavily vegetated by stands of stinging nettle and giant ragweed. These plants have very shallow root systems that lack true ability

to help hold soils in place. The lack of well vegetated and thick root systems contributes to the erodibility of the west bank. The west bank lacks any presence of woody vegetation.

Heartland also believes that since the completion of the 2015 Memo the stream channel has continued progressing through the channel evolution model (CEM) stages. The 2015 assessment concurred that the stream channel was in between Stage 3 and Stage 4 of the CEM. It is Heartland's opinion that since the 2015 assessment, paired with higher water levels, that the majority of the stream channel along the east boundary is now firmly in Stage 4 and the east bank of the channel is experiencing Stage 5 in some areas. Overall, the west bank is the area of greatest concern for erosion control and streambank stabilization efforts.

The southern portion of the west bank has an active erosion lip at 12- 24" of steep sluffing bank in various spots. A patch of active erosion and bank slumping can be clearly seen in Photo #3. The water level and continued active sluffing of banks has widened the stream channel and decreased overall depth with increased sediment deposition in the streambed.

Stream Restoration Recommendations

In the 2015 Memo the following management strategies were proposed:

1. Do nothing
2. Trap sediment downstream
3. Vegetation techniques
4. Re-slope and stabilize the banks
5. Installation of an underground pipe and re-sloping of the banks.

Heartland believes that implementing a combination of options 3 and 4, vegetation techniques and re-sloping and stabilizing the banks would be an appropriate course of action. Only the southern two-thirds of the west bank appear to require earthwork in the conditions as were present on the day of the inspection. The northeast portion of the site can be seen at grade with the current height of water in Photo #8. This allows this area to function as floodplain for Spring Brook at times of high flows. Heartland believes allowing more portions of the mitigation area to function in this fashion would help to alleviate the sediment loading issues being experienced further downstream and within Bohner's Lake. The differing site conditions between the completed memo in 2015 and the current conditions leads Heartland to recommend that further assessment of the stream channel characteristics may be appropriate to account for current site conditions and any necessary potential modifications to the 2015 stream restoration plan. This may be appropriate to complete in coordination with the grading contractor.

CONCLUSION

Heartland noted varying qualities of plant communities within the mitigation site. The previously restored wetland areas remain of the highest quality portions of the site and compared to benchmark indicators are generally of fair quality, while the areas that had received less management efforts remain degraded and poor to very poor quality. Overall, the wetland communities throughout the site are comprised of 20% -30% invasive plant species (primarily reed canary grass) while the upland areas are more heavily dominated by

invasive species (~40%). Continued vegetation management within the mitigation site will be necessary to improve or maintain its current conditions in order to fully comply with the proposed conservation easement of the site. A site-specific, adaptive Vegetation Management Plan should be created in conjunction with BLSD to create a goal-driven management process that is appropriate for the funding available. However, BLSD should be prepared to invest a minimum of $10,000 to $15,000 annually to maintain site conditions in compliance with the Corps requirements. If additional funds become available through outside sourcing such as grant opportunities additional management efforts would lead to overall site quality improvements.

The Spring Brook channel continues to erode and deposit sediment loads within the waterway and would benefit from stream channel stabilization efforts as proposed in the 2015 stream channel stabilization plan. However, some characteristics of the channel appear to have evolved since the time of the plan development and some modifications may be warranted based on current conditions.

Please feel free to contact Heartland if you have any questions regarding this Site Assessment Report.

Regards,

Jeff Kraemer, Principal
Heartland Ecological Group, Inc.
jeff@heartlandecological.com
608.490.2450 Ext. 2

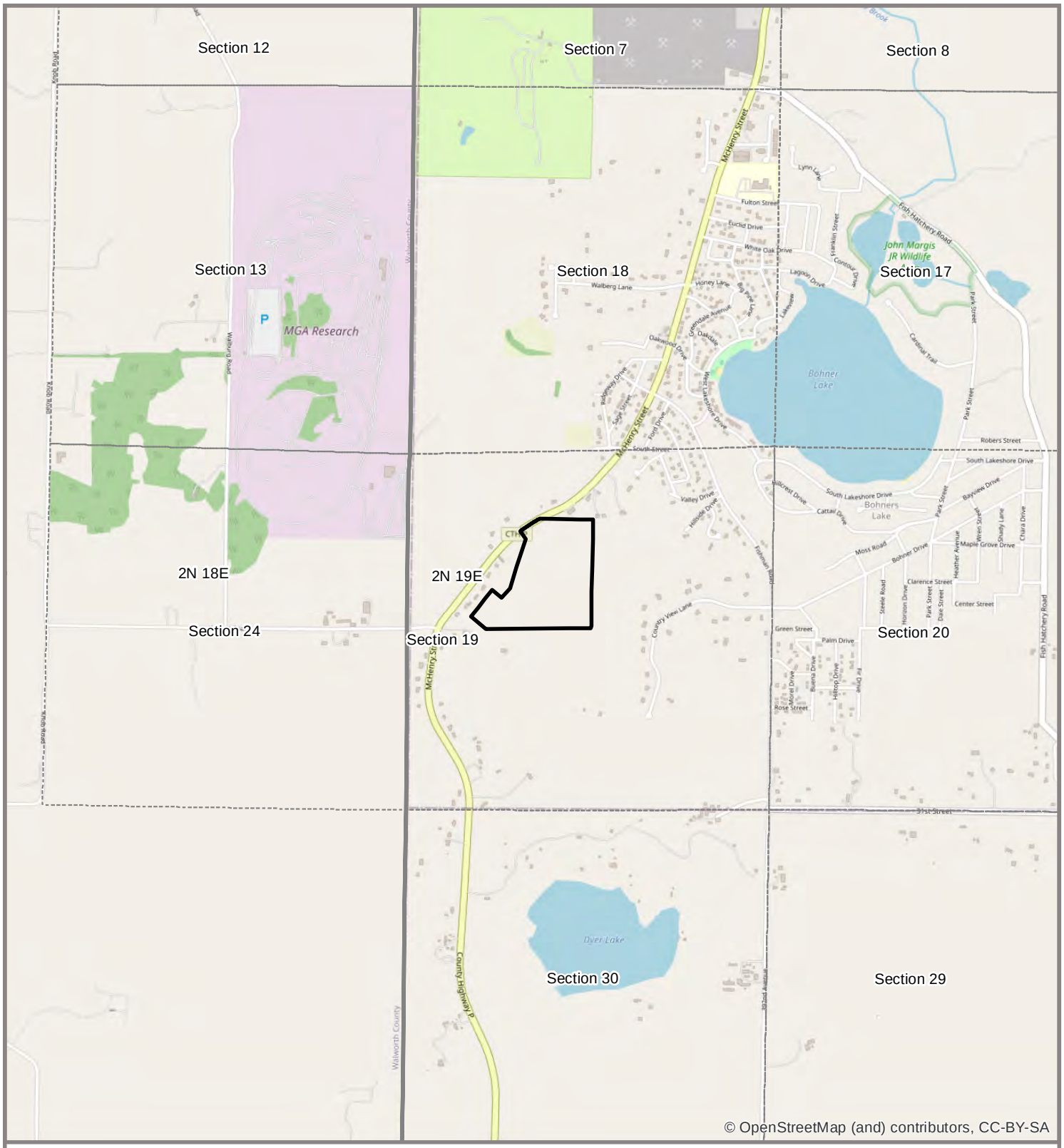
Scott Fuchs, Environmental Technician
Heartland Ecological Group, Inc.
scott@heartlandecological.com
608.490.2450 Ext. 4

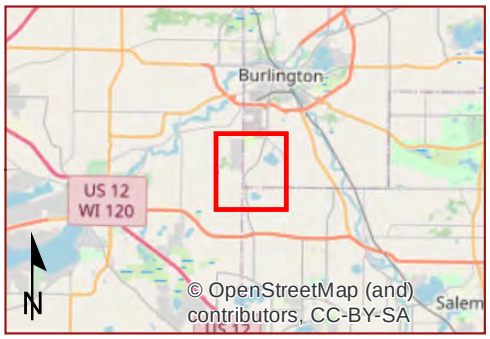
Jason Behrends, Restoration Manager
Heartland Ecological Group, Inc.
jason@heartlandecological.com
608.490.2450 Ext. 5

Attachments:

1 – Project Location Map
2 – Site Seeding / Establishment Plan
3 – Assessment Areas and Meander Paths Map
4 – Planted Communities and Observations Map
5 – Timed Meander Survey Data
6 – Vegetation Survey Photolog
7 – Wetland Community Condition Benchmarks
8 – Spring Brook Photolog
9 – Draft Revised Conservation Easement

Attachment 1 | Project Location Map





Mitigation Site Area

Township

Section

0 1,000 2,000 Ft

Heartland ECOLOGICAL GROUP INC

Baumeister Mitigation Site Location

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

OpenStreetMap Data: ESRI *11/11/2020*

Attachment 2 | Site Seeding / Establishment Plan

PROJECT ID: 3180-08-71

COUNTY: RACINE

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
Section No.	7	Sign Plates
Section No.	8	Structure Plans
Section No.	9	Computer Earthwork Data
Section No.	9	Cross Sections

TOTAL SHEETS =



N

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CITY OF BURLINGTON BYPASS

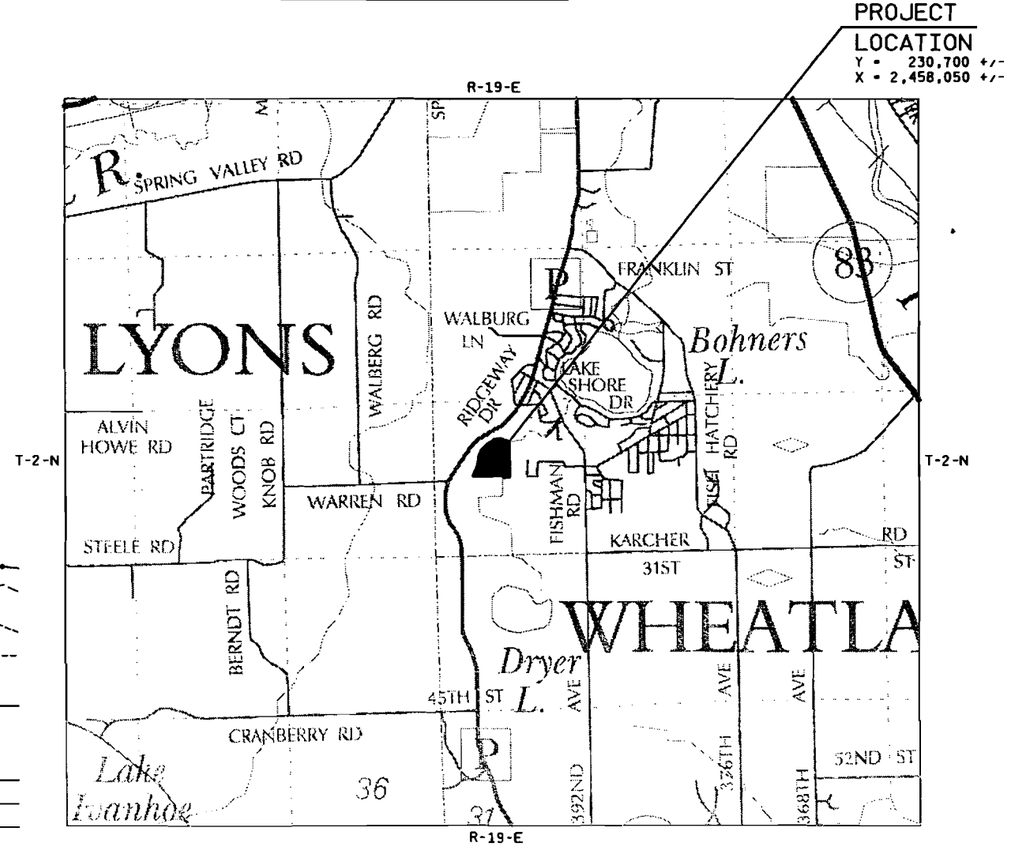
(WETLAND MITIGATION - BAUMEISTER FARM)

NON-HIGHWAY
RACINE COUNTY

STATE PROJECT NUMBER
3180-08-71

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
3180-08-71		

RECEIVED
MAY 25 2006
REGULATORY BRANCH
WAUKESHA



LAYOUT
SCALE 0 ½ MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

All coordinates on this plan are ground coordinates, (unless noted X, Y for grid) based on the Wisconsin State Plane Coordinate system (WSPCS) NAD 27 South Zone. To convert ground coordinates (N, E) to Grid Coordinates (Y, X), multiply ground coordinate by a combination factor of 0.99998531 and add 2,000,000 to the X coordinate.

Elevations shown on this plan are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

DESIGN DESIGNATION

A.D.T.	=	N/A
A.D.T.	=	N/A
D.H.V.	=	N/A
D.D.	=	N/A
T.	=	N/A
DESIGN SPEED	=	N/A
ESALS	=	N/A

CONVENTIONAL SYMBOLS

PLAN
- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE
- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

UTILITIES
- ELECTRIC (E)
- FIBER OPTIC (FO)
- GAS (G)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

ORIGINAL PLANS PREPARED BY

TN & A TN & Associates, Inc.
Engineering and Science

WISCONSIN
JASON R. MATSON
37111
WAUKESHA, WI
PROFESSIONAL ENGINEER

1/30/2006 (Date)
(Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

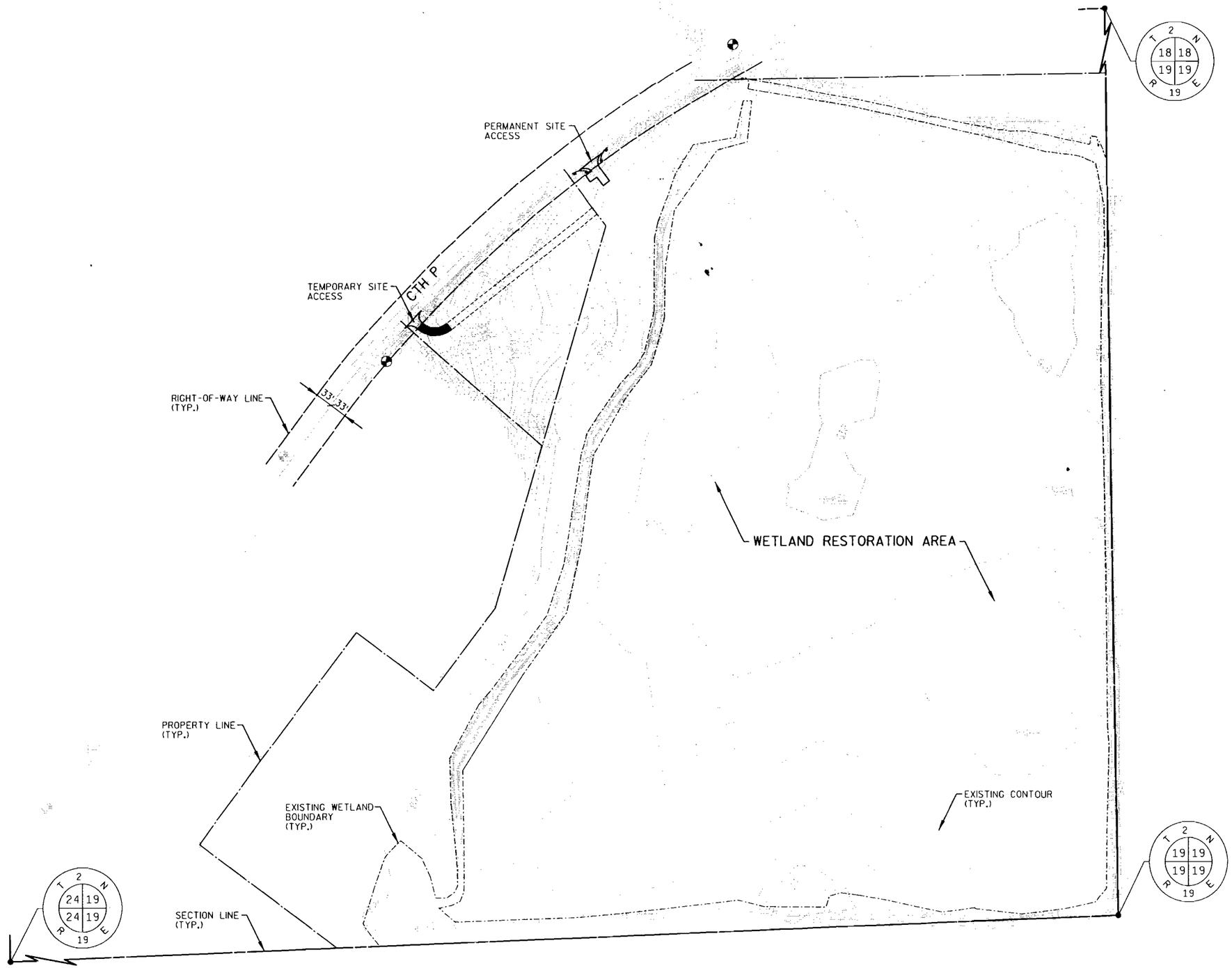
PREPARED BY

Surveyor	WISDOT
Designer	TN & ASSOCIATES
Project Manager	A. SMEJA
District Examiner	K. LEITHOFF
District Supervisor	D. SKORY
C.O. Examiner	

APPROVED FOR DISTRICT OFFICE

DATE 1/30/06 Andrew J. Smeja (Signature)

E

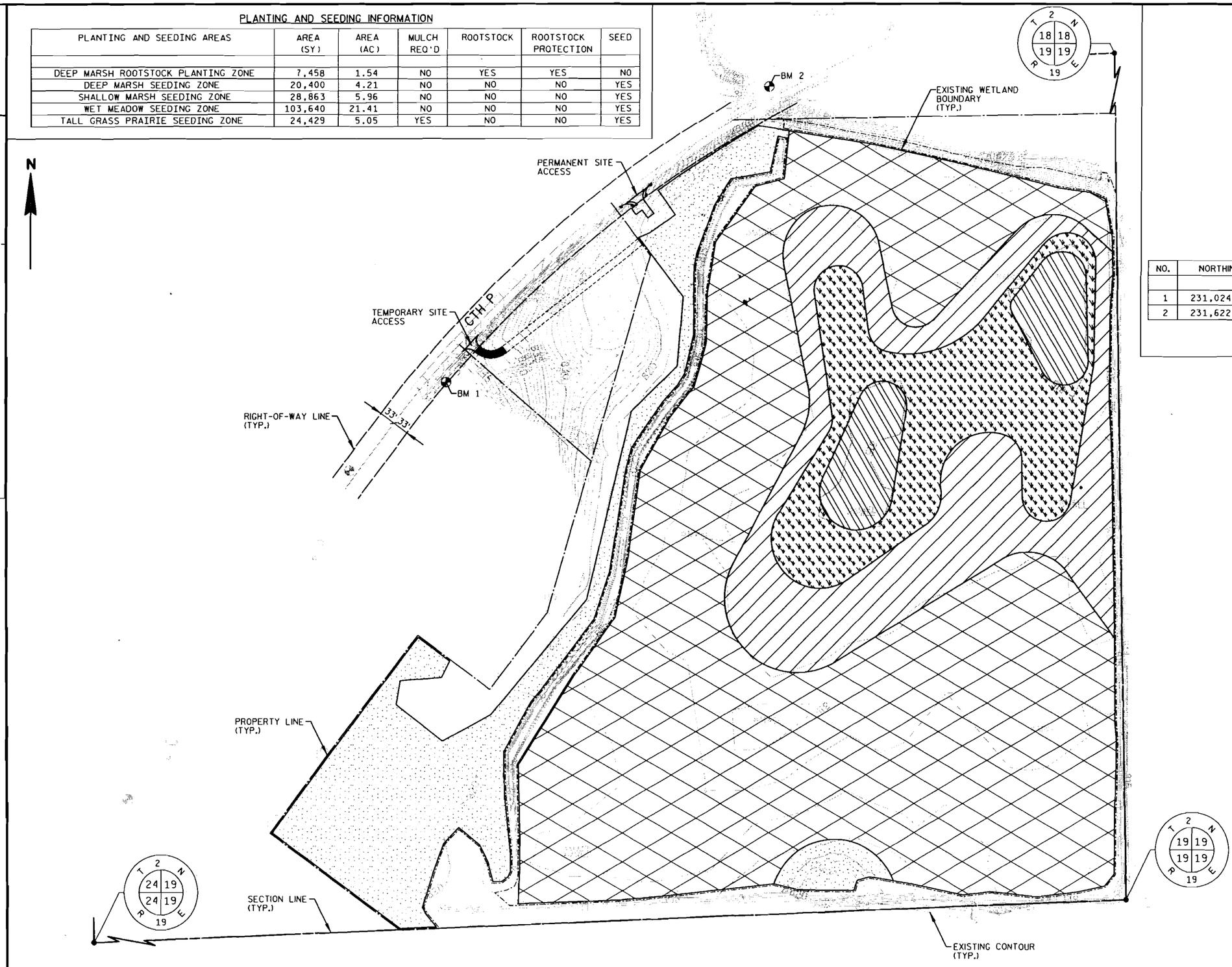


2

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PROJECT OVERVIEW	SCALE, FEET 0 100 200	SHEET	E

PLANTING AND SEEDING INFORMATION

PLANTING AND SEEDING AREAS	AREA (SY)	AREA (AC)	MULCH REQ'D	ROOTSTOCK	ROOTSTOCK PROTECTION	SEED
DEEP MARSH ROOTSTOCK PLANTING ZONE	7,458	1.54	NO	YES	YES	NO
DEEP MARSH SEEDING ZONE	20,400	4.21	NO	NO	NO	YES
SHALLOW MARSH SEEDING ZONE	28,863	5.96	NO	NO	NO	YES
WET MEADOW SEEDING ZONE	103,640	21.41	NO	NO	NO	YES
TALL GRASS PRAIRIE SEEDING ZONE	24,429	5.05	YES	NO	NO	YES



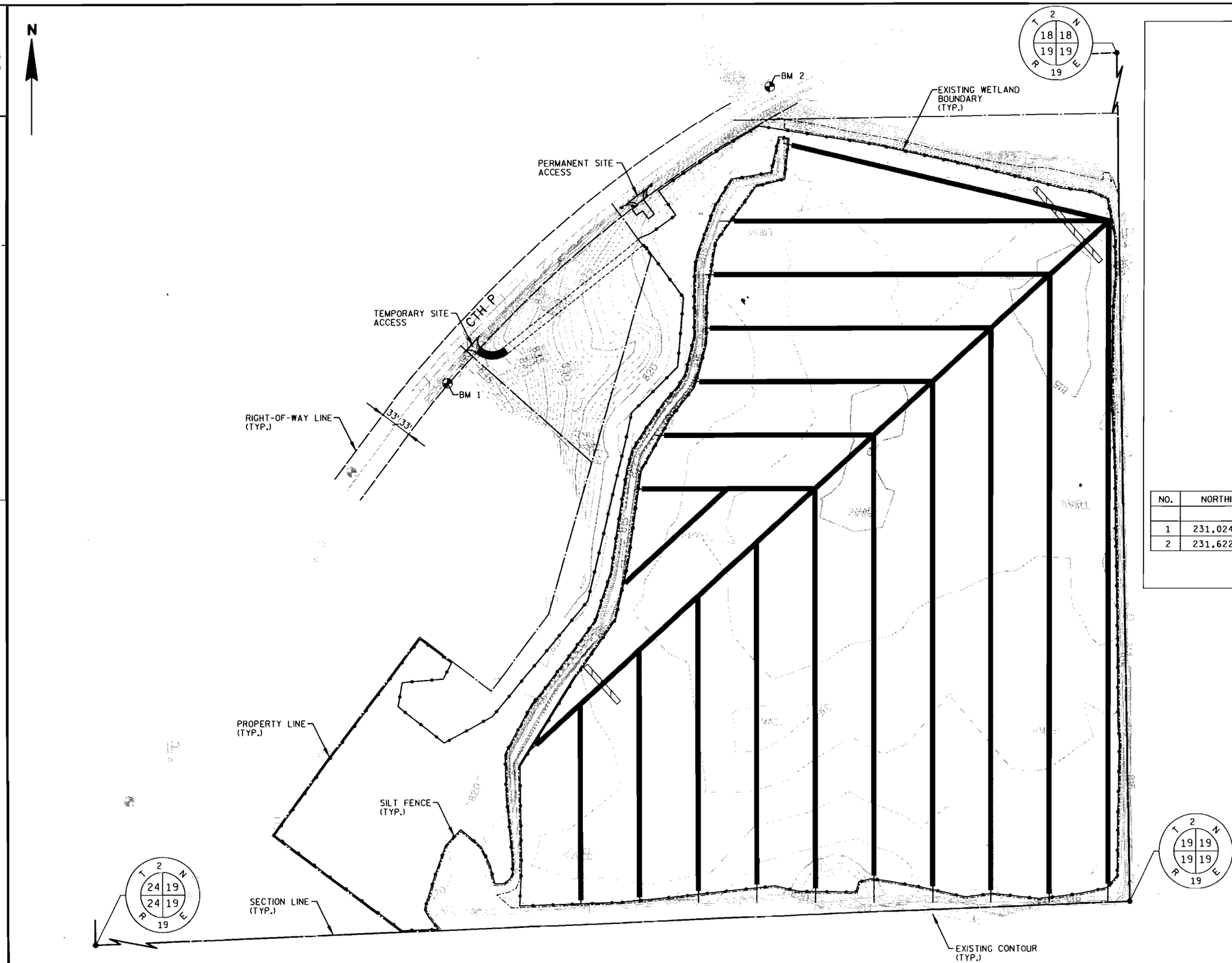
PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E



DRAIN TILE DISABLEMENT LEGEND

- DRAIN TILE (APPROXIMATE LOCATION)
- DRAIN TILE DISABLEMENT
- DRAIN TILE EXPLORATION

SUGGESTED DRAIN TILE DISABLEMENT SEQUENCE OF EVENTS

1. USE DRAIN TILE EXPLORATION TO EXPOSE THE DRAIN TILE MAIN LINE.
2. DISABLE DRAIN TILE MAIN LINE MAKING SURE TO LOCATE ALL CONNECTING DRAIN TILE LINES.
3. DISABLE ALL OTHER DRAIN TILE LINES LOCATED DURING DISABLEMENT OF DRAIN TILE MAIN LINE.

NOTES:

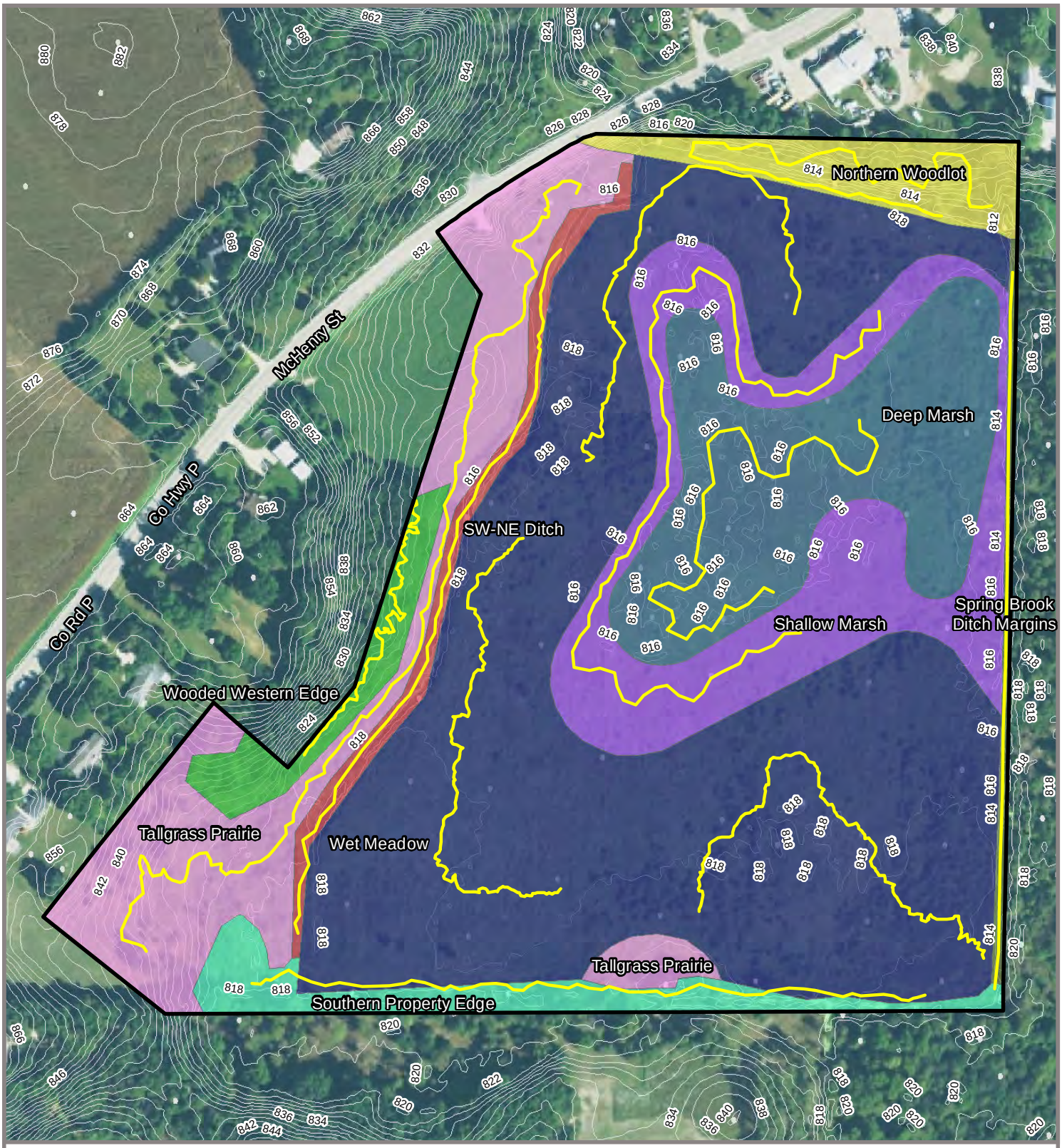
1. THE ENTIRE DRAIN TILE SYSTEM IS TO BE DISABLED.
2. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
3. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
4. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
5. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
6. SEE DRAIN TILE DISABLEMENT CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

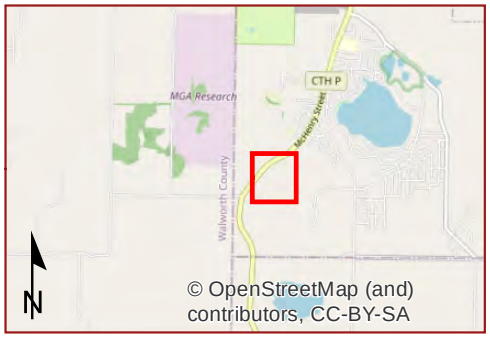
BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP *89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	DRAIN TILE DISABLEMENT	SCALE, FEET 0 100 200	SHEET	E

Attachment 3 | Assessment Areas and Meander Paths





Mitigation Site
Meander Survey Paths

Assessment Areas

- Deep Marsh
- Northern Woodlot
- SW-NE Ditch
- Shallow Marsh
- Southern Property Edge
- Spring Brook Ditch Margins
- Tallgrass Prairie
- Wet Meadow
- Wooded Western Edge

0 125 250 Ft

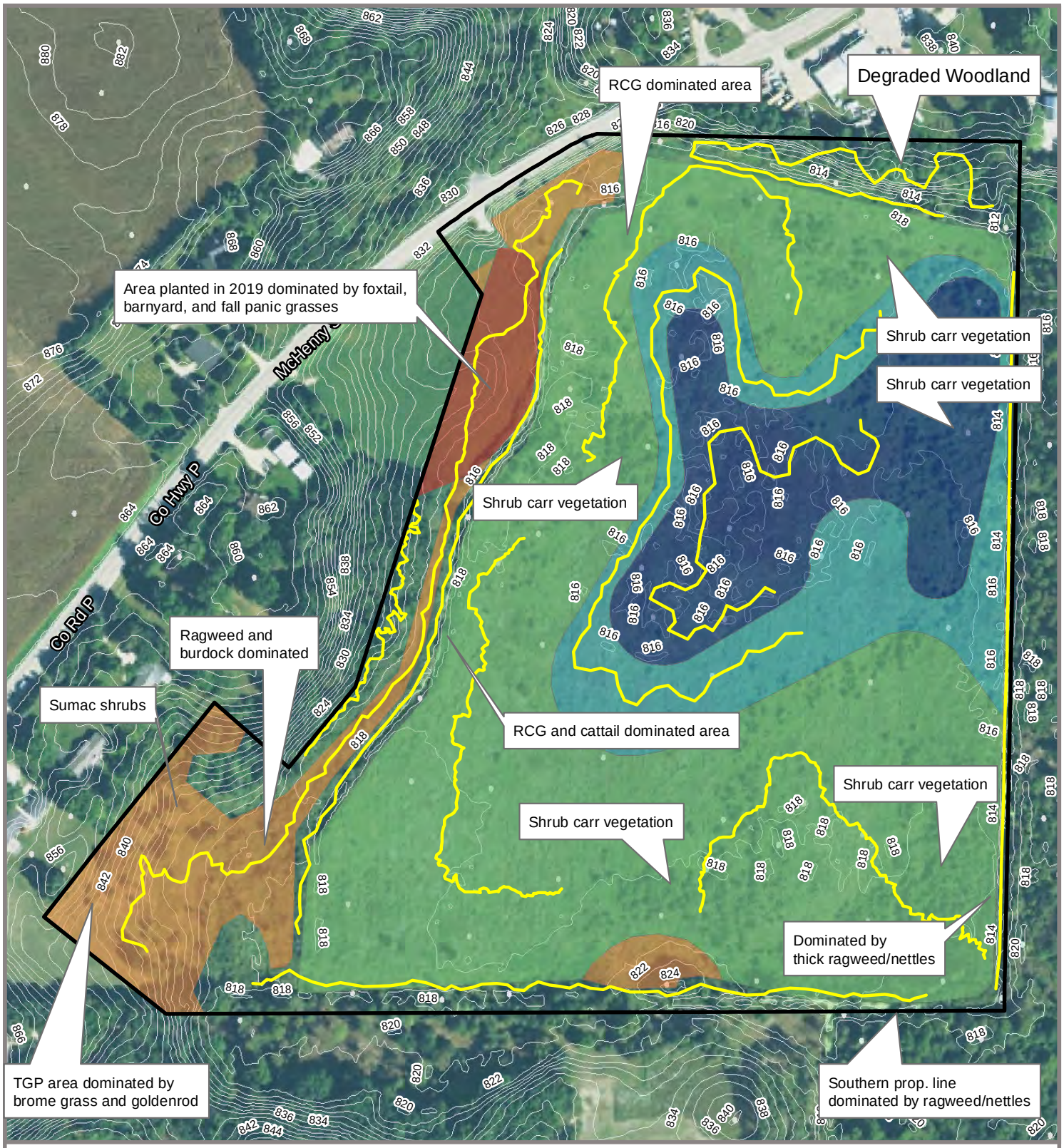
Heartland ECOLOGICAL GROUP INC

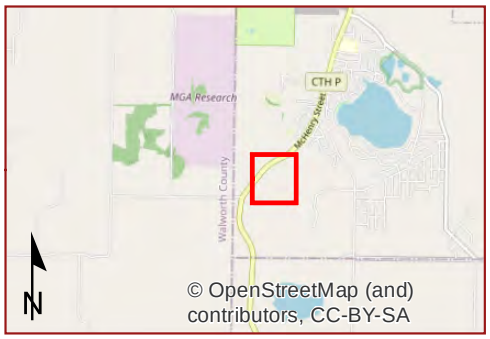
Vegetation Survey Assessment Areas

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

2018 NAIP
Data: Racine Co, HEG *11/11/2020*

Attachment 4 | Planted Communities and Observations Map





Mitigation Site
Racine Co 2' Contours
Meander Survey Paths

0 125 250 Ft

Vegetative Communities

- Deep Marsh (6.09 ac)
- Shallow Marsh (5.89 ac)
- Wet Meadow (21.64 ac)
- Tallgrass Prairie (4.87 ac)
- Re-Planted Upland Buffer (1.18 ac)

Heartland ECOLOGICAL GROUP INC

VegetationSurveys & Observations

Baumeister Site
Project #20190224
T2N, R19E, S19
T Burlington, Racine Co, WI

2018 NAIP
Data: Racine Co, HEG *11/11/2020*

Attachment 5 | Timed Meander Survey Data

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Shallow Marsh
ASSESSMENT AREA NAME:	Deep Marsh		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.620801		
	Longitude:	-88.297619	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Deep marsh area looks nice, no/few invasives. Deep marsh area has 4-12 inches of standing water throughout.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
16	15	1	15%	8%	13.2	16.5	3.4	4.3	12.8	15.8	3.2	3.9	7.0	3.0	3.4	4.6
													2%	2%	116%	80%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Typang	15	*Typha angustifolia*	*narrow-leaved cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha angustifolia*
Typlat	15	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Spaeur	60	*Sparganium eurycarpum*	*broad-fruit bur-reed, common bur-reed,*	5	OBL	Native	aquatic	perennial	0	0	*Sparganium eurycarpum*
Bolflu	40	*Bolboschoenus fluviatilis*	*river bulrush*	6	OBL	Native	herb	perennial	0	0	*Bolboschoenus fluviatilis*
Epicil	7	*Epilobium ciliatum*	*American willow-herb, hairy willow-her*	3	FACW	Native	herb	perennial	0	0	*Epilobium ciliatum*
Impcap	5	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
Perpen	5	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Sympun	8	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
Pilpum	12	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Saglat	10	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*
Lemmin	10	*Lemna minor*	*common duckweed, lesser duckweed, s*	4	OBL	Native	aquatic	perennial	0	0	*Lemna minor*
Bidcer	3	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
Ambtri	1	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-c*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Schtab	5	*Schoenoplectus tabernaemontani*	*great bulrush, soft-stem bulrush*	4	OBL	Native	herb	perennial	0	0	*Schoenoplectus tabernaemontani*
Salbeb	2	*Salix bebbiana*	*beaked willow, Bebb's willow*	7	FACW	Native	tree	perennial	0	0	*Salix bebbiana*
Corser	2	*Cornus sericea*	*red osier dogwood*	3	FACW	Native	shrub	perennial	0	0	*Cornus sericea*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Disturbed Hardwoods
ASSESSMENT AREA NAME:	North Wood Lot		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.622359		
	Longitude:	-88.296956	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	heavily degraded wooded slope. Rocky soils with few quality natives present.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
34	22	12	125%	46%	13.9	13.2	3.0	2.8	11.1	8.9	1.9	1.5	2.8	0.6	0.9	0.0
													91%	42%	139%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
fraaln	4	*Frangula alnus*	*European alder buckthorn, glossy buckt*	0	FACW/FAC	Introduced	shrub	perennial	0	Restricted	*Rhamnus frangula*
rubocc	3	*Rubus occidentalis*	*black-cap, black raspberry*	2	0	Native	shrub	perennial	0	0	*Rubus occidentalis*
phaaru	7	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
urtdio	9	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Ambtri	8	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
rubcan	2	*Rubus canadensis*	*smooth blackberry*	4	0	Native	shrub	perennial	0	0	*Rubus canadensis*
impcap	4	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
moralb	22	*Morus alba*	*Russian mulberry, white mulberry*	0	FAC/FACU	Introduced	tree	perennial	0	Restricted	*Morus alba*
artvul	11	*Artemisia vulgaris*	*common wormwood, mugwort, sage-w*	0	UPL	Introduced	herb	perennial	0	0	*Artemisia vulgaris*
phyame	2	*Phytolacca americana*	*American pokeberry, pokeweed*	1	FACU	Native	herb	perennial	0	0	*Phytolacca americana*
symool	1	*Symphyotrichum oolentangiense*	*sky-blue aster*	5	0	Native	herb	0	0	0	*Symphyotrichum oolentangiense*
gletri	18	*Gleditsia triacanthos*	*honey locust*	7	FACU/FAC	Native	tree	perennial	0	0	*Gleditsia triacanthos*
helgro	2	*Helianthus grosseserratus*	*saw-tooth sunflower*	2	FACW	Native	herb	perennial	0	0	*Helianthus grosseserratus*
eutmac	3	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
picgla	5	*Picea glauca*	*white spruce*	7	FACU	Native	tree	perennial	0	0	*Picea glauca*
rhacat	11	*Rhamnus cathartica*	*common buckthorn, European buckthor*	0	FAC	Introduced	shrub	perennial	0	Restricted	*Rhamnus cathartica*
corrac	3	*Cornus foemina*	*gray dogwood, northern swamp dogwo*	2	FAC	Native	shrub	perennial	0	0	*Cornus racemosa*

Wisconsin Floristic Quality Calculator Version 1.3.17

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
corser	2	*Cornus sericea*	*red osier dogwood*	3	FACW	Native	shrub	perennial	0	0	*Cornus sericea*
arclap	12	*Arctium lappa*	*great burdock*	0	0	Introduced	herb	biennial	0	0	*Arctium lappa*
cirarv	6	*Cirsium arvense*	*Canada thistle, creeping thistle, field thi*	0	FACU	Introduced	herb	perennial	0	Restricted	*Cirsium arvense*
vitrip	8	*Vitis riparia*	*frost grape, river bank grape*	2	FACW/FAC	Native	herb	perennial	0	0	*Vitis riparia*
parqui	10	*Parthenocissus quinquefolia*	*Virginia creeper, woodbine*	5	FACU	Native	tree	perennial	0	0	*Parthenocissus quinquefolia*
lonmaa	17	*Lonicera maackii*	*Amur honeysuckle, Maack's honeysuckl*	0	0	Introduced	shrub	perennial	0	Prohibited/Restricted	*Lonicera maackii*
glehed	8	*Glechoma hederacea*	*creeping-Charlie, gill-over-the-ground, g*	0	FACU	Introduced	herb	perennial	0	Caution	*Glechoma hederacea*
lacbie	2	*Lactuca biennis*	*tall blue lettuce, woodland lettuce*	3	FAC	Native	herb	annual/bienr	0	0	*Lactuca biennis*
hacvir	4	*Hackelia virginiana*	*beggar's-lice, stickseed, wild comfrey*	3	FACU	Native	herb	biennial	0	0	*Hackelia virginiana*
secvar	7	*Securigera varia*	*crown-vetch, purple crown-vetch*	0	0	Introduced	herb	perennial	0	Restricted	*Securigera varia*
agealt	12	*Ageratina altissima*	*white snakeroot*	1	FACU	Native	herb	perennial	0	0	*Ageratina altissima*
allpet	9	*Alliaria petiolata*	*garlic mustard*	0	FAC/FACU	Introduced	herb	biennial	0	Restricted	*Alliaria petiolata*
aceneg	25	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
hydvir	7	*Hydrophyllum virginianum*	*John's-cabbage, Shawnee-salad, Virgini*	4	FAC	Native	herb	perennial	0	0	*Hydrophyllum virginianum*
hesmat	11	*Hesperis matronalis*	*dame's rocket*	0	FACU	Introduced	herb	biennial/pere	0	Restricted	*Hesperis matronalis*
ulmrub	11	*Ulmus rubra*	*red elm, slippery elm*	4	FAC	Native	tree	perennial	0	0	*Ulmus rubra*
viosor	6	*Viola sororia*	*door-yard violet, common blue violet, h*	3	FAC	Native	herb	annual/perei	0	0	*Viola sororia*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Ruderal/Disturbed Wet Mewadow
ASSESSMENT AREA NAME:	Southern Proeprty Edge		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.618237		
	Longitude:	-88.297103	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Southern property edge, apparently unplanted during site establishment. Dominated by RCG, Urt dio, Set fab. This area is managed through mowing. Boundary between S property boundary area and wet meadow to the north is solid Amb tri.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
31	18	13	75%	39%	10.6	6.1	2.5	1.4	8.1	4.9	1.5	0.9	0.8	3.0	0.9	0.0
													5%	1%	188%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Chealb	1	*Chenopodium album*	*common lamb's-quarters, lamb's-quarte*	0	FACU	Native	herb	annual	0	0	*Chenopodium album*
Setfab	25	*Setaria faberi*	*giant foxtail, Japanese bristle grass, noc*	0	FACU	Introduced	herb	annual	0	0	*Setaria faberi*
Setpum	10	*Setaria pumila*	*pigeon grass, yellow foxtail*	0	FAC	Introduced	herb	annual	0	0	*Setaria pumila*
Urtdio	75	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Bidcer	3	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
Phaaru	20	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Perpen	2	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Permac	3	*Persicaria maculosa*	*heart's-ease, spotted lady's-thumb*	0	FACW/FAC	Introduced	herb	annual	0	0	*Persicaria maculosa*
Carcom	1	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
Lacser	2	*Lactuca serriola*	*compass-plant, prickly lettuce*	0	FACU	Introduced	herb	annual/bienr	0	0	*Lactuca serriola*
Plamaj	1	*Plantago major*	*broad-leaved plantain, common plantai*	0	FAC/FACU	Introduced	herb	perennial	0	0	*Plantago major*
Pancap	3	*Panicum capillare*	*common witch grass, old-witch grass, w*	1	FAC	Native	herb	0	0	0	*Panicum capillare*
Carvul	1	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
Typang	3	*Typha angustifolia*	*narrow-leaved cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha angustifolia*
Echcru	3	*Echinochloa crus-galli*	*barnyard grass, large barnyard grass*	0	FACW/FAC	Introduced	herb	annual	0	0	*Echinochloa crus-galli*
Daucar	3	*Daucus carota*	*Queen Anne's-lace, wild carrot*	0	UPL	Introduced	herb	biennial	0	Non-Restricted	*Daucus carota*
Aceneg	2	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Cypesc	5	*Cyperus esculentus*	*field nut sedge, flat sedge, yellow nut se*	0	FACW	Native	herb	perennial	0	0	*Cyperus esculentus*
Angatr	2	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
Persag	5	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
Calcan	2	*Calamagrostis canadensis*	*blue-joint grass*	5	OBL	Native	herb	perennial	0	0	*Calamagrostis canadensis*
Leocar	1	*Leonurus cardiaca*	*lion's-tail, motherwort*	0	0	Introduced	herb	perennial	0	0	*Leonurus cardiaca*
Ambtri	10	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Cirvul	1	*Cirsium vulgare*	*bull thistle*	0	FACU	Introduced	herb	biennial	0	0	*Cirsium vulgare*
Moralb	1	*Morus alba*	*Russian mulberry, white mulberry*	0	FAC/FACU	Introduced	tree	perennial	0	Restricted	*Morus alba*
Popdel	2	*Populus deltoides*	*eastern cottonwood*	2	FAC	Native	tree	perennial	0	0	*Populus deltoides*
Symnov	2	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Pilpum	1	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Epicol	1	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Rubida	1	*Rubus idaeus*	*wild red raspberry*	3	FACU/FAC*	Native	shrub	perennial	0	0	*Rubus idaeus*
Poapra	2	*Poa pratensis*	*Kentucky bluegrass*	0	FAC/FACU	Introduced	herb	perennial	0	0	*Poa pratensis*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	low quality marsh
ASSESSMENT AREA NAME:	Spring Brook Ditch Margins		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.620271		
	Longitude:	-88.296068	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	20-ft within the lip of the ditch bank and on West bank of the ditch. Largely dominated by Urt dio and Amb tri in south half. At grade with water line in north half w/ medium quality marsh in north half.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
33	26	7	42%	22%	17.3	9.8	3.4	1.9	15.3	8.6	2.7	1.5	0.0	2.6	1.4	4.0
													2%	10%	176%	4%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
polsag	7	*Persicaria sagittata*	*arrow-leaved tear-thumb*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
phaaru	17	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
polhyd1	3	*Persicaria hydropiper*	*marsh-pepper knotweed, water-pepper*	0	OBL	Introduced	herb	0	0	0	*Persicaria hydropiper*
urtdio	30	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
ambtri	45	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
setfab	8	*Setaria faberi*	*giant foxtail, Japanese bristle grass, noa*	0	FACU	Introduced	herb	annual	0	0	*Setaria faberi*
impcap	4	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
lytala	2	*Lythrum alatum*	*winged loosestrife, winged lythrum*	6	OBL	Native	herb	0	0	0	*Lythrum alatum*
pilpum	1	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
bidfro	1	*Bidens frondosa*	*common beggar-ticks, devil's beggar-tic*	1	FACW	Native	herb	annual	0	0	*Bidens frondosa*
echlob	4	*Echinocystis lobata*	*balsam-apple, wild-cucumber*	2	FACW	Native	herb	annual	0	0	*Echinocystis lobata*
doeumb	1	*Doellingeria umbellata*	*flat-top aster, parasol aster, tall flat-top*	6	FACW	Native	herb	perennial	0	0	*Doellingeria umbellata*
solcan	6	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
solspe	1	*Solidago speciosa*	*showy goldenrod*	5	0	Native	herb	perennial	0	0	*Solidago speciosa*
eutmac	2	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
eupper	1	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
typgla	2	*Typha X glauca*	*hybrid cat-tail, white cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha X glauca*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
helaut	3	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
salexi	4	*Salix interior*	*Narrowleaf willow, sandbar willow*	2	FACW	Native	shrub	perennial	0	0	*Salix interior*
carvul	6	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
stemed	1	*Stellaria media*	*common chickweed*	0	FACU	Introduced	herb	annual/perei	0	0	*Stellaria media*
eutgra	4	*Euthamia graminifolia*	*common flat-topped goldenrod, grass-le*	4	FACW/FAC	Native	herb	perennial	0	0	*Euthamia graminifolia*
cirarv	7	*Cirsium arvense*	*Canada thistle, creeping thistle, field thi*	0	FACU	Introduced	herb	perennial	0	Restricted	*Cirsium arvense*
saglat	2	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*
spaeur	2	*Sparganium eurycarpum*	*broad-fruit bur-reed, common bur-reed,*	5	OBL	Native	aquatic	perennial	0	0	*Sparganium eurycarpum*
soldul	4	*Solanum dulcamara*	*bittersweet nightshade*	0	FAC	Introduced	herb	perennial	0	0	*Solanum dulcamara*
ascinc	5	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
schacu	2	*Schoenoplectus acutus*	*hard-stem bulrush*	6	OBL	Native	herb	perennial	0	0	*Schoenoplectus acutus*
carbeb	4	*Carex bebbii*	*Bebb's oval sedge, Bebb's sedge*	4	OBL	Native	herb	perennial	0	0	*Carex bebbii*
samcan	6	*Sambucus canadensis*	*American elder, elderberry*	3	FAC/FACW	Native	shrub	perennial	0	0	*Sambucus nigra ssp. canadensis*
lycame	3	*Lycopus americanus*	*American water-horehound, common w*	4	OBL	Native	herb	perennial	0	0	*Lycopus americanus*
aceneg	2	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
sciatr	2	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Shallow Marsh
ASSESSMENT AREA NAME:	Shallow Marsh		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.621320		
	Longitude:	-88.298180	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Shallow marsh area saturated to surface throughout the majority, up to 3 inches of water elsewhere. Very little in the way of invasives observed. Some shrubby pockets present.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
27	25	2	15%	7%	19.4	20.5	3.9	4.1	18.7	19.9	3.6	3.8	7.0	3.0	3.8	4.0
													3%	3%	208%	6%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Solgig	15	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
Scicyp	30	*Scirpus cyperinus*	*wool-grass*	4	OBL	Native	herb	perennial	0	0	*Scirpus cyperinus*
Glystr	15	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
Sympun	40	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
Salbeb	3	*Salix bebbiana*	*beaked willow, Bebb's willow*	7	FACW	Native	tree	perennial	0	0	*Salix bebbiana*
Bolflu	25	*Bolboschoenus fluviatilis*	*river bulrush*	6	OBL	Native	herb	perennial	0	0	*Bolboschoenus fluviatilis*
Ascinc	3	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
Sciatr	8	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
Epicol	5	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Perpen	3	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Verhas	1	*Verbena hastata*	*blue vervain, simpler's-joy, swamp verb*	3	FACW	Native	herb	biennial/per	0	0	*Verbena hastata*
Corser	3	*Cornus sericea*	*red osier dogwood*	3	FACW	Native	shrub	perennial	0	0	*Cornus sericea*
Typlat	10	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Typang	10	*Typha angustifolia*	*narrow-leaved cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha angustifolia*
Calcan	2	*Calamagrostis canadensis*	*blue-joint grass*	5	OBL	Native	herb	perennial	0	0	*Calamagrostis canadensis*
Persag	3	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
Phaaru	5	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Carvul	3	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
Verfas	3	*Vernonia fasciculata*	*common ironweed, prairie ironweed, sn*	5	FACW	Native	herb	0	0	0	*Vernonia fasciculata*
Cusgro	3	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dc*	4	0	Native	herb	annual/perei	0	0	*Cuscuta gronovii*
Leeory	10	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
Impcap	5	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
Saglat	3	*Sagittaria latifolia*	*broad-leaved arrowhead*	3	OBL	Native	aquatic	perennial	0	0	*Sagittaria latifolia*
Pilpum	3	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Eupper	3	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
Onosen	3	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*
spaeur	3	*Sparganium eurycarpum*	*broad-fruit bur-reed, common bur-reed,*	5	OBL	Native	aquatic	perennial	0	0	*Sparganium eurycarpum*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Disturbed wet meadow
ASSESSMENT AREA NAME:	Southwest to northeast ditch corridor		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.619620		
	Longitude:	-88.300132	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	~25 foot wide corridor centered on SW - NE running ditch. Ditch is 1 ft deep and 3-4 ft wide, has a very silty/mucky bottom. This area apparently not planted during bank establishment. ~25% of ditch corridor dominated by Ace neg and Rha cat
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	*w* FQI_n	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	*w* FQI_a	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
25	19	6	88%	36%	11.9	8.0	2.7	1.8	10.4	5.9	2.1	1.2	1.4	1.1	0.8	4.0
													11%	14%	192%	25%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Phaaru	60	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Permac	7	*Persicaria maculosa*	*heart's-ease, spotted lady's-thumb*	0	FACW/FAC	Introduced	herb	annual	0	0	*Persicaria maculosa*
Leeory	3	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
Typlat	5	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Bidcer	10	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
Ambtri	50	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Aceneg	5	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
Urtdio	20	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Symnov	2	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Jugnig	2	*Juglans nigra*	*black walnut*	3	FACU	Native	tree	perennial	0	0	*Juglans nigra*
Verurt	2	*Verbena urticifolia*	*nettle-leaved vervain, white vervain*	2	FAC	Native	herb	perennial	0	0	*Verbena urticifolia*
Rhacat	10	*Rhamnus cathartica*	*common buckthorn, European buckthor*	0	FAC	Introduced	shrub	perennial	0	Restricted	*Rhamnus cathartica*
Epicol	3	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Pilpum	8	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Leocar	8	*Leonurus cardiaca*	*lion's-tail, motherwort*	0	0	Introduced	herb	perennial	0	0	*Leonurus cardiaca*
ACESACCH ARI	3	*Acer saccharinum*	*silver maple, soft maple*	2	FACW	Native	tree	perennial	0	0	*Acer saccharinum*
Lemmin	25	*Lemna minor*	*common duckweed, lesser duckweed, s*	4	OBL	Native	aquatic	perennial	0	0	*Lemna minor*

Wisconsin Floristic Quality Calculator Version 1.3.17

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Alninc	3	*Alnus incana*	*speckled alder*	4	FACW	Native	shrub	perennial	0	0	*Alnus incana*
Impcap	7	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
Persag	3	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
Allpet	2	*Alliaria petiolata*	*garlic mustard*	0	FAC/FACU	Introduced	herb	biennial	0	Restricted	*Alliaria petiolata*
Ulmame	1	*Ulmus americana*	*American elm, white elm*	3	FACW	Native	tree	perennial	0	0	*Ulmus americana*
SAMCAN	1	*Sambucus canadensis*	*American elder, elderberry*	3	FAC/FACW	Native	shrub	perennial	0	0	*Sambucus nigra ssp. canadensis*
Abuthe	1	*Abutilon theophrasti*	*piemarker, velvet-leaf*	0	FACU	Introduced	herb	annual	0	0	*Abutilon theophrasti*
Sympun	1	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Heavily disturbed planted prairie
ASSESSMENT AREA NAME:	Tallgrass Prairie		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.618697		
	Longitude:	-88.301778	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	2019 replanted area included in this meander - dominated by Set fab, Set pum, Pan dic, Ech cru, Pan cap. Skinny strip running adjacent to ditch is more of a wet meadow than upland prairire and has been used as a driving lane to access southern portion of the site. Main body of TGP
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
39	22	17	140%	51%	9.0	5.3	1.9	1.1	6.7	3.4	1.1	0.5	0.0	1.3	0.5	0.0
													5%	12%	256%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Phaaru	15	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Sympil	1	*Symphyotrichum pilosum*	*frost aster*	1	FACU	Native	herb	perennial	0	0	*Symphyotrichum pilosum*
Ambtri	20	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Solcan	25	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
Urtdio	7	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Symnov	1	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Eutgra	2	*Euthamia graminifolia*	*common flat-topped goldenrod, grass-le*	4	FACW/FAC	Native	herb	perennial	0	0	*Euthamia graminifolia*
Ascsyr	4	*Asclepias syriaca*	*common milkweed, silkweed*	1	FACU/UPL	Native	herb	perennial	0	0	*Asclepias syriaca*
Aceneg	3	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
Cirarv	1	*Cirsium arvense*	*Canada thistle, creeping thistle, field thi*	0	FACU	Introduced	herb	perennial	0	Restricted	*Cirsium arvense*
Arcmin	7	*Arctium minus*	*common burdock, lesser burdock*	0	FACU	Introduced	herb	biennial	0	0	*Arctium minus*
Passat	2	*Pastinaca sativa*	*wild parsnip*	0	0	Introduced	herb	biennial	0	Restricted	*Pastinaca sativa*
Rumcri	2	*Rumex crispus*	*curly dock, sour dock*	0	FAC	Introduced	herb	perennial	0	0	*Rumex crispus*
Helaut	2	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
Setfab	20	*Setaria faberi*	*giant foxtail, Japanese bristle grass, noc*	0	FACU	Introduced	herb	annual	0	0	*Setaria faberi*
Setpum	20	*Setaria pumila*	*pigeon grass, yellow foxtail*	0	FAC	Introduced	herb	annual	0	0	*Setaria pumila*
Lacser	1	*Lactuca serriola*	*compass-plant, prickly lettuce*	0	FACU	Introduced	herb	annual/bienr	0	0	*Lactuca serriola*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Silvul	1	*Silene vulgaris*	*bladder-campion, maiden's-tears*	0	0	Introduced	herb	perennial	0	0	*Silene vulgaris*
Echcru	2	*Echinochloa crus-galli*	*barnyard grass, large barnyard grass*	0	FACW/FAC	Introduced	herb	annual	0	0	*Echinochloa crus-galli*
Permac	3	*Persicaria maculosa*	*heart's-ease, spotted lady's-thumb*	0	FACW/FAC	Introduced	herb	annual	0	0	*Persicaria maculosa*
Triarv	5	*Trifolium arvense*	*rabbit-foot clover*	0	0	Introduced	herb	annual	0	0	*Trifolium arvense*
Pancap	25	*Panicum capillare*	*common witch grass, old-witch grass, w*	1	FAC	Native	herb	0	0	0	*Panicum capillare*
Carvul	1	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
CARGRA2	1	*Carex granularis*	*limestone meadow sedge*	3	FACW	Native	herb	perennial	0	0	*Carex granularis*
Typlat	2	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Carsti	2	*Carex stipata*	*common fox sedge, owl-fruit sedge*	2	OBL	Native	herb	perennial	0	0	*Carex stipata*
Concan	15	*Conyza canadensis*	*Canadian horseweed, fleabane, hogwee*	0	FACU	Native	herb	0	0	0	*Conyza canadensis*
Eristr	2	*Erigeron strigosus*	*daisy fleabane, prairie fleabane, rough j*	2	FACU	Native	herb	annual	0	0	*Erigeron strigosus*
Daucar	15	*Daucus carota*	*Queen Anne's-lace, wild carrot*	0	UPL	Introduced	herb	biennial	0	Non-Restricted	*Daucus carota*
Bidcer	3	*Bidens cernua*	*nodding beggar-ticks, nodding bur-mari*	4	OBL	Native	herb	annual	0	0	*Bidens cernua*
Epicil	3	*Epilobium ciliatum*	*American willow-herb, hairy willow-her*	3	FACW	Native	herb	perennial	0	0	*Epilobium ciliatum*
Cypesc	1	*Cyperus esculentus*	*field nut sedge, flat sedge, yellow nut se*	0	FACW	Native	herb	perennial	0	0	*Cyperus esculentus*
Broine	40	*Bromus inermis*	*Hungarian brome, smooth brome*	0	FACU/UPL	Introduced	herb	perennial	0	Non-Restricted	*Bromus inermis*
Moralb	2	*Morus alba*	*Russian mulberry, white mulberry*	0	FAC/FACU	Introduced	tree	perennial	0	Restricted	*Morus alba*
Solgig	3	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
Rhugla	8	*Rhus glabra*	*smooth sumac*	2	0	Native	shrub	perennial	0	0	*Rhus glabra*
Rudhir	2	*Rudbeckia hirta*	*black-eyed Susan*	4	FACU	Native	herb	0	0	0	*Rudbeckia hirta*
LonXbel	2	*Lonicera X bella*	*Bell's honeysuckle, showy bush honeysu*	0	FACU	Introduced	shrub	perennial	0	Restricted	*Lonicera X bella*
Rhacat	2	*Rhamnus cathartica*	*common buckthorn, European buckthor*	0	FAC	Introduced	shrub	perennial	0	Restricted	*Rhamnus cathartica*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Wet Meadow
ASSESSMENT AREA NAME:	Wet Meadow Meander 1		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.618794		
	Longitude:	-88.296858	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	First of three wet meadow meanders. Some portions of wet meadow area are transitioning into shrub carr due to lack of fire.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		Non-Natives			Floristic Quality Metrics: Native Species (n)				Floristic Quality Metrics: All Species (a)				$w\bar{C}_a$ By Growth Form:			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
30	28	2	31%	16%	17.0	18.2	3.2	3.4	16.4	15.9	3.0	2.9	5.0	2.6	2.8	0.0
													7%	7%	186%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Ambtri	2	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Epicol	10	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Phaaru	30	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Urtdio	5	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Echlob	1	*Echinocystis lobata*	*balsam-apple, wild-cucumber*	2	FACW	Native	herb	annual	0	0	*Echinocystis lobata*
Angatr	2	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
Solcan	15	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
Aceneg	2	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
Salbeb	5	*Salix bebbiana*	*beaked willow, Bebb's willow*	7	FACW	Native	tree	perennial	0	0	*Salix bebbiana*
Symnov	15	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Carcom	2	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
Pilpum	2	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Soldul	1	*Solanum dulcamara*	*bittersweet nightshade*	0	FAC	Introduced	herb	perennial	0	0	*Solanum dulcamara*
Impcap	3	*Impatiens capensis*	*orange jewelweed, orange touch-me-nc*	2	FACW	Native	herb	annual	0	0	*Impatiens capensis*
Corser	4	*Cornus sericea*	*red osier dogwood*	3	FACW	Native	shrub	perennial	0	0	*Cornus sericea*
Glystr	3	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
Sympun	30	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Eutmac	3	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
Perpen	5	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Poapal	15	*Poa palustris*	*fowl meadow grass, marsh bluegrass*	5	FACW	Native	herb	perennial	0	0	*Poa palustris*
Solgig	20	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
Scicyp	3	*Scirpus cyperinus*	*wool-grass*	4	OBL	Native	herb	perennial	0	0	*Scirpus cyperinus*
Helaut	3	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
Salint	3	*Salix interior*	*sandbar willow*	2	FACW	Native	shrub	perennial	0	0	*Salix interior*
Eupper	3	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
Typlat	1	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Alitri	1	*Alisma triviale*	*northern water-plantain*	4	OBL	Native	herb	perennial	0	0	*Alisma triviale*
Sciatr	1	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
Ascinc	2	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
Leeory	8	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Wet Meadow
ASSESSMENT AREA NAME:	Wet Meadow Meander 2		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.619551		
	Longitude:	-88.299789	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Second of three wet meadow meanders. Some shrubby areas present. Low % of Pha aru throughout, but a couple pockets of dense Pha aru also present. On the whole, decent quality.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
35	33	2	8%	3%	19.7	21.6	3.4	3.8	19.1	21.4	3.2	3.6	6.0	2.0	3.6	0.0
													5%	3%	226%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Sympun	60	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
Solgig	20	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
Scicyp	5	*Scirpus cyperinus*	*wool-grass*	4	OBL	Native	herb	perennial	0	0	*Scirpus cyperinus*
Eupper	5	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
Epicol	10	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Ascinc	3	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
Typlat	3	*Typha latifolia*	*broad-leaved cat-tail, common cat-tail*	1	OBL	Native	herb	perennial	0	0	*Typha latifolia*
Perpen	3	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Phaaru	7	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Pensed	3	*Penthorum sedoides*	*ditch stonecrop*	3	OBL	Native	herb	perennial	0	0	*Penthorum sedoides*
Symnov	15	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Cusgro	3	*Cuscuta gronovii*	*common dodder, scald-weed, swamp dc*	4	0	Native	herb	annual/perei	0	0	*Cuscuta gronovii*
Leeory	25	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
Poapal	8	*Poa palustris*	*fowl meadow grass, marsh bluegrass*	5	FACW	Native	herb	perennial	0	0	*Poa palustris*
Solcan	10	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
Urtdio	3	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*
Sciatr	5	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Eutmac	3	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
Salint	3	*Salix interior*	*sandbar willow*	2	FACW	Native	shrub	perennial	0	0	*Salix interior*
Salbeb	4	*Salix bebbiana*	*beaked willow, Bebb's willow*	7	FACW	Native	tree	perennial	0	0	*Salix bebbiana*
Helaut	4	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
Ambtri	1	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Verfas	2	*Vernonia fasciculata*	*common ironweed, prairie ironweed, sn*	5	FACW	Native	herb	0	0	0	*Vernonia fasciculata*
Glystr	10	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
Carcom	3	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
Mimrin	3	*Mimulus ringens*	*Allegheny monkey-flower, monkey-flow*	6	OBL	Native	herb	perennial	0	0	*Mimulus ringens*
Carvul	3	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
Carsti	3	*Carex stipata*	*common fox sedge, owl-fruit sedge*	2	OBL	Native	herb	perennial	0	0	*Carex stipata*
Schtab	1	*Schoenoplectus tabernaemontani*	*great bulrush, soft-stem bulrush*	4	OBL	Native	herb	perennial	0	0	*Schoenoplectus tabernaemontani*
Verhas	1	*Verbena hastata*	*blue vervain, simpler's-joy, swamp verb*	3	FACW	Native	herb	biennial/per	0	0	*Verbena hastata*
Rumcri	1	*Rumex crispus*	*curly dock, sour dock*	0	FAC	Introduced	herb	perennial	0	0	*Rumex crispus*
Sympil	1	*Symphyotrichum pilosum*	*frost aster*	1	FACU	Native	herb	perennial	0	0	*Symphyotrichum pilosum*
Angatr	1	*Angelica atropurpurea*	*common great angelica, great angelica,*	6	OBL	Native	herb	perennial	0	0	*Angelica atropurpurea*
ACESACCH ARI	1	*Acer saccharinum*	*silver maple, soft maple*	2	FACW	Native	tree	perennial	0	0	*Acer saccharinum*
Onosen	1	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Wet Meadow
ASSESSMENT AREA NAME:	Wet Meadow Meander 3		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.622099		
	Longitude:	-88.298727	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Similar to other two wet meadow meanders. Some % of Pha aru throughout, some pockets of dense Pha aru. Some shrubby pockets of Sal beb, Sal int, and Cor alb/Cor ser.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
33	31	2	40%	15%	20.1	22.3	3.6	4.0	19.5	19.5	3.4	3.4	6.5	3.0	3.2	0.0
													12%	3%	247%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Sympun	70	*Symphyotrichum puniceum*	*swamp aster*	5	OBL	Native	herb	perennial	0	0	*Symphyotrichum puniceum*
Eutmac	8	*Eutrochium maculatum*	*spotted Joe-Pye-weed*	4	OBL	Native	herb	perennial	0	0	*Eutrochium maculatum*
Salbeb	10	*Salix bebbiana*	*beaked willow, Bebb's willow*	7	FACW	Native	tree	perennial	0	0	*Salix bebbiana*
Helaut	2	*Helenium autumnale*	*common sneezeweed*	4	FACW	Native	herb	perennial	0	0	*Helenium autumnale*
Solcan	5	*Solidago canadensis*	*Canadian goldenrod*	1	FACU	Native	herb	perennial	0	0	*Solidago canadensis*
Solgig	10	*Solidago gigantea*	*giant goldenrod*	3	FACW	Native	herb	perennial	0	0	*Solidago gigantea*
Leeory	25	*Leersia oryzoides*	*rice cut grass*	3	OBL	Native	herb	perennial	0	0	*Leersia oryzoides*
Sympil	1	*Symphyotrichum pilosum*	*frost aster*	1	FACU	Native	herb	perennial	0	0	*Symphyotrichum pilosum*
Glystr	10	*Glyceria striata*	*fowl manna grass, fowl meadow grass*	4	OBL	Native	herb	perennial	0	0	*Glyceria striata*
Poapal	8	*Poa palustris*	*fowl meadow grass, marsh bluegrass*	5	FACW	Native	herb	perennial	0	0	*Poa palustris*
Perpen	3	*Persicaria pensylvanica*	*Pennsylvania knotweed, Pennsylvania s*	1	FACW	Native	herb	annual	0	0	*Persicaria pensylvanica*
Verfas	3	*Vernonia fasciculata*	*common ironweed, prairie ironweed, sn*	5	FACW	Native	herb	0	0	0	*Vernonia fasciculata*
Phaaru	30	*Phalaris arundinacea*	*reed canary grass*	0	FACW	Introduced	herb	perennial	0	Non-restricted	*Phalaris arundinacea*
Symnov	10	*Symphyotrichum novae-angliae*	*New England aster*	3	FACW	Native	herb	perennial	0	0	*Symphyotrichum novae-angliae*
Corser	2	*Cornus sericea*	*red osier dogwood*	3	FACW	Native	shrub	perennial	0	0	*Cornus sericea*
Persag	1	*Persicaria sagittata*	*arrow-leaved tearthumb, arrow vine*	6	OBL	Native	herb	annual	0	0	*Persicaria sagittata*
Urtdio	5	*Urtica dioica*	*stinging nettle*	1	FACW/FAC	Native	herb	perennial	0	0	*Urtica dioica*

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Typang	10	*Typha angustifolia*	*narrow-leaved cat-tail*	0	OBL	Introduced	herb	perennial	0	Restricted	*Typha angustifolia*
Ascinc	2	*Asclepias incarnata*	*swamp milkweed*	5	OBL	Native	herb	perennial	0	0	*Asclepias incarnata*
Sciatr	3	*Scirpus atrovirens*	*black bulrush, dark-green bulrush*	3	OBL	Native	herb	perennial	0	0	*Scirpus atrovirens*
Scicyp	3	*Scirpus cyperinus*	*wool-grass*	4	OBL	Native	herb	perennial	0	0	*Scirpus cyperinus*
Eupper	4	*Eupatorium perfoliatum*	*boneset, common boneset, thoroughwo*	6	OBL/FACW	Native	herb	perennial	0	0	*Eupatorium perfoliatum*
Epicol	7	*Epilobium coloratum*	*cinnamon willow-herb, eastern willow-h*	3	OBL	Native	herb	perennial	0	0	*Epilobium coloratum*
Eutgra	2	*Euthamia graminifolia*	*common flat-topped goldenrod, grass-le*	4	FACW/FAC	Native	herb	perennial	0	0	*Euthamia graminifolia*
Ambtri	2	*Ambrosia trifida*	*giant ragweed, great ragweed, horse-cc*	0	FAC	Native	herb	annual	0	0	*Ambrosia trifida*
Samcan	1	*Sambucus canadensis*	*American elder, elderberry*	3	FAC/FACW	Native	shrub	perennial	0	0	*Sambucus nigra ssp. canadensis*
Salnig	2	*Salix nigra*	*black willow*	4	OBL	Native	tree	perennial	0	0	*Salix nigra*
Carcom	3	*Carex comosa*	*bristly sedge*	5	OBL	Native	herb	perennial	0	0	*Carex comosa*
Carvul	8	*Carex vulpinoidea*	*brown fox sedge, fox sedge*	2	FACW/OBL	Native	herb	perennial	0	0	*Carex vulpinoidea*
Carsti	5	*Carex stipata*	*common fox sedge, owl-fruit sedge*	2	OBL	Native	herb	perennial	0	0	*Carex stipata*
Onosen	2	*Onoclea sensibilis*	*sensitive fern*	5	FACW	Native	herb	perennial	0	0	*Onoclea sensibilis*
Alitri	2	*Alisma triviale*	*northern water-plantain*	4	OBL	Native	herb	perennial	0	0	*Alisma triviale*
Mimrin	3	*Mimulus ringens*	*Allegheny monkey-flower, monkey-flow*	6	OBL	Native	herb	perennial	0	0	*Mimulus ringens*

Wisconsin Floristic Quality Calculator Version 1.3.17

SITE NAME:	Baumeister Mitigation Site		**PLANT COMMUNITY:**	Disturbed Oak/Hickory Woodland
ASSESSMENT AREA NAME:	Wooded Western Edge		**SURVEYORS:**	Scott Fuchs, Jason Behrends, Heartland Ecological Group
GPS COORDINATES (Decimal Degrees)	**Latitude:**	42.619899		
	Longitude:	-88.300266	**SURVEY DATE:**	9/22/2020
COUNTY:	Racine County		**SITE NOTES:**	Wooded western edge of site. Consists of heavily disturbed oak/hickory woodlands. Oaks are quite old, 75-100 yrs. Understory and groundlayer heavily invaded by invasive shrubs and weeds.
ECOREGION (LEVEL III):	Southeastern Wisconsin Till Plains			

RESULTS:		**Non-Natives**			**Floristic Quality Metrics: Native Species (n)**				**Floristic Quality Metrics: All Species (a)**				**$w\bar{C}_a$ By Growth Form:**			
N_a	N_n	$N_{int.}$	Non-Native Total Cover:	Non-Native Relative Cover	FQI_n	$w\,FQI_n$	Mean C $\bar{C}_n$	Weighted Mean C $w\bar{C}_n$	FQI_a	$w\,FQI_a$	Mean C $\bar{C}_a$	Weighted Mean C $w\bar{C}_a$	Tree	Shrub	Herb	Aquatic
15	9	6	132%	49%	12.0	13.0	4.0	4.3	9.3	8.5	2.4	2.2	4.4	0.0	0.6	0.0
													123%	65%	79%	0%

:Total Cover

ENTER SPECIES CODE:	ENTER % COVER:	Scientific Name	Common Name	C-Value	Wetland Ind. Status (MW/NCNE)	WI Status	Growth Form	Duration	NHI Status	Invasive (NR40) Status	Accepted ITIS Name
Allpet	60	*Alliaria petiolata*	*garlic mustard*	0	FAC/FACU	Introduced	herb	biennial	0	Restricted	*Alliaria petiolata*
Pilpum	10	*Pilea pumila*	*Canadian clearweed*	3	FACW	Native	herb	annual	0	0	*Pilea pumila*
Quealb	50	*Quercus alba*	*white oak*	7	FACU	Native	tree	perennial	0	0	*Quercus alba*
Pruser	5	*Prunus serotina*	*wild black cherry*	3	FACU	Native	tree	perennial	0	0	*Prunus serotina*
Rhacat	60	*Rhamnus cathartica*	*common buckthorn, European buckthor*	0	FAC	Introduced	shrub	perennial	0	Restricted	*Rhamnus cathartica*
Aceneg	30	*Acer negundo*	*ash-leaved maple, box elder*	0	FAC	Native	tree	perennial	0	0	*Acer negundo*
ACESACCH ARU	10	*Acer saccharum*	*hard maple, sugar maple*	5	FACU	Native	tree	perennial	0	0	*Acer saccharum*
Parqui	5	*Parthenocissus quinquefolia*	*Virginia creeper, woodbine*	5	FACU	Native	tree	perennial	0	0	*Parthenocissus quinquefolia*
Hacvir	5	*Hackelia virginiana*	*beggar's-lice, stickseed, wild comfrey*	3	FACU	Native	herb	biennial	0	0	*Hackelia virginiana*
Lonxbel	5	*Lonicera X bella*	*Bell's honeysuckle, showy bush honeysu*	0	FACU	Introduced	shrub	perennial	0	Restricted	*Lonicera X bella*
Moralb	3	*Morus alba*	*Russian mulberry, white mulberry*	0	FAC/FACU	Introduced	tree	perennial	0	Restricted	*Morus alba*
Carovat	10	*Carya ovata*	*shagbark hickory, shellbark hickory*	5	FACU	Native	tree	perennial	0	0	*Carya ovata*
Leocar	2	*Leonurus cardiaca*	*lion's-tail, motherwort*	0	0	Introduced	herb	perennial	0	0	*Leonurus cardiaca*
Quemac	10	*Quercus macrocarpa*	*bur oak*	5	FAC/FACU	Native	tree	perennial	0	0	*Quercus macrocarpa*
Arcmin	2	*Arctium minus*	*common burdock, lesser burdock*	0	FACU	Introduced	herb	biennial	0	0	*Arctium minus*

Attachment 6 | Vegetation Survey Photolog



Photo #1 Re-planted tallgrass prairie area.



Photo #2 Re-planted tallgrass prairie area.



Photo #3 Western skinny strip of tallgrass prairie assessment area.



Photo #4 Western skinny strip of tallgrass prairie assessment area.



Photo #5 Representative photo of the main body of tallgrass prairie assessment area.



Photo #6 Representative photo of the main body of tallgrass prairie assessment area. Taken from the southwestern corner of the site.



Photo #7 Southwest – northeast ditch assessment area.



Photo #8 Southwest – northeast ditch assessment area.



Photo #9 Western woodland assessment area.



Photo #10 Western woodland assessment area.



Photo #11 Representative photo of shrubby pockets within wet meadow assessment areas.



Photo #12 Representative photo of shrubby pockets within wet meadow assessment areas.



Photo #13 Representative photo of open wet meadow areas.



Photo #14 Representative photo of open wet meadow areas.



Photo #15 Representative photo of open wet meadow areas.



Photo #16 Representative photo of open wet meadow areas.



Photo #17 Representative photo of open wet meadow areas.



Photo #18 Representative photo of open wet meadow areas.



Photo #19 RCG dominated pocket of wet meadow area near parking area off of McHenry Street.



Photo #20 RCG dominated pocket of wet meadow near the southwest – northeast ditch.



Photo #21 Photo representative of shallow marsh assessment area.



Photo #22 Photo representative of shallow marsh assessment area.



Photo #23 Photo representative of deep marsh assessment area.



Photo #24 Photo representative of deep marsh assessment area.



Photo #25 Photo representative of southern property line assessment area.



Photo #26 Photo representative of southern property line assessment area.



Photo #27 Photo representative of Spring Brook assessment area.



Photo #28 Photo representative of Spring Brook assessment area.

Attachment 7 | Wetland Community Condition Benchmarks



Preliminary **Weighted Mean C (w̄C)** Condition Benchmarks for **Southeast WI Till Plains** and **Central Corn Belt Plains** Wetlands based on Overall Disturbance Scores.

	Natural Community:	Condition Category:				
		Least Disturbed			Most Disturbed	
		Excellent	Good	Fair	Poor	Very Poor
Emergent	Emergent Marsh	> 5.7	4.1 - 5.7	2.1 - 4.0	1.0 - 2.0	< 1.0
	Southern Sedge Meadow	> 6.3	5.6 - 6.3	3.8 - 5.5	1.0 - 3.7	< 1.0
	Wet-Mesic Prairie	> 5.5	4.6 - 5.5	3.1 - 4.5	1.9 - 3.0	< 1.9
	Calcareous Fen	> 7.0	6.2 - 7.0	3.6 - 6.1	2.2 - 3.5	< 2.2
Shrub	Shrub-Carr	> 5.1	4.7 - 5.1	3.2 - 4.6	2.3 - 3.1	< 2.3
Forested	Northern Hardwood Swamp	> 6.2	5.4 - 6.2	3.6 - 5.3	3.4 - 3.5	< 3.4
	Southern Hardwood Swamp	> 4.7	4.0 - 4.7	2.9 - 3.9	2.0 - 2.8	< 2.0
	Cedar Swamp (NWMF)	> 6.5	6.5	5.8 - 6.4	5.3 - 5.7	< 5.3
	Floodplain Forest	> 4.0	3.4 - 4.0	2.3 - 3.3	2.2	< 2.2

Source: Marti, A.M. and T.W. Bernthal. 2019. Provisional wetland floristic quality benchmarks for wetland monitoring and assessment in Wisconsin. Final Report to US EPA Region V, Grants # CD00E01576 and #CD00E02075. Wisconsin Department of Natural Resources. Unpublished manuscript.

Attachment 8 | Spring Brook Photo Log



Photo #1 SE corner of Mitigation Site, view N along Spring Brook.



Photo #2 Middle of Wet Meadow community, view N along Spring Brook.



Photo #3 S End of Shallow Marsh community, view S along Spring Brook.



Photo #4 S End of Shallow Marsh community, view N along Spring Brook.



Photo #5 Spring Brook leaving the mitigation site, view East. Beaver Dam present off-site



Photo #6 Spring Brook leaving the mitigation site, view N.



Photo #7 Confluence of stream leaving mitigation site and joining Spring Brook, view W.



Photo #8 Confluence of stream leaving mitigation site and joining Spring Brook, view S.

Attachment 9 | Draft Revised Conservation Easement

Amended Restrictive Covenants

Whereas, by means of a document entitled Restrictive Covenants dated August 7, 2012 and recorded August 9, 2012 in the office of the Racine County Register of Deeds as Document #2326318, the Wisconsin Department of Transportation imposed certain covenants on the following described real estate located in the Town of Burlington, Racine County, Wisconsin:

That part of the Northwest 1/4 of Section 19, Township 2 North, Range 19 East, in the Town of Burlington, Racine County, state of Wisconsin described as follows:

NAME AND RETURN ADDRESS:

002 02 19 19 011 010

Parcel Identification Number (PIN)

Commence at the North 1/4 corner of said Section 19; run thence South 0° 58' 36" East 1,040.91 feet along the north-south 1/4 line of said Section to the point of beginning; continue thence South 0° 58' 36" East 1,586.91 feet along the north-south 1/4 line of said to the Center of said Section; thence South 87° 43' 45" West 1,490.33 feet along the east-west 1/4 line of said Section; thence North 53° 35' 29" West 324.77 feet to an iron pipe stake; thence North 36° 35' 23" East 166.79 feet to an iron pipe stake; thence North 37° 13' 50" East 330.79 feet; thence South 53° 05' 57" East 182.78 feet to an iron pipe stake; thence North 36° 44' 40" East 194.52 feet to an iron pipe stake; thence North 16° 06' 15" East 317.79 feet to an iron pipe stake; thence North 16° 06' 15" East 433.69 feet; thence North 37° 00' 00" West 133.00 feet to the center line of C.T.H. P; thence Northeasterly along said centerline 300.00 feet to a north property line of the owner; thence North 89° 01' 24" East 784.77 feet along said property line to the point of beginning. This parcel contains 45.23 acres, more or less, exclusive of lands previously conveyed or dedicated for highway purposes.

Whereas, the Wisconsin Department of Transportation intends by this document to amend the recorded covenants affecting the above described property;

Now, therefore, the Restrictive Covenants dated August 7, 2012 and recorded August 9, 2012 in the office of the Racine County Register of Deeds as Document #2326318 affecting the above-described real estate are hereby amended to provide as follows:

Access and Inspection. The Wisconsin Department of Transportation (DOT), its contractors, agents and invitees; the Wisconsin Department of Natural Resources (DNR); and the Army Corps of Engineers (COE) shall have the right to enter the Wetland Mitigation Site, in a reasonable manner and at reasonable times, for the purpose of inspecting the Wetland Restoration Site which serves as Mitigation for the Burlington Bypass, to determine if any successor or assigns is complying with the conservation covenants listed below.

The representatives of the above named entities shall have the further right to observe, study, record, make scientific studies and educational observations, and to allow for a harvest of common wetland plant seed and root stock (not including state and federal listed threatened and endangered species) for replanting on the Wetland Mitigation Site and other DOT wetland restoration sites or projects if the activity does not threaten the long term establishment and density of native vegetation and seed bank.

Covenants. The following restrictive conservation covenants shall run with the land and bind the

Wetland Mitigation site in perpetuity. These covenants apply to restoration and non-restoration acreage within the legal description and include, but are not limited to, upland prairie buffers, stream banks, existing wetlands, and wetland restoration acreage.

Uses. There shall be no commercial, industrial, residential or other incompatible activities undertaken or allowed within the Wetland Mitigation Site.

Buildings and Structures. There shall be no buildings, dwellings, barns, roads advertising signs, billboards or other structures built or placed in the Wetland Mitigation Site or in trees, provided, however, that structures essential to maintaining the site or structures, such as interpretive signs or other additions that enhance the public's use of the site, can be installed with written approval from the Corps of Engineers.

Topography. There shall be no dredging, filling, excavating, mining, drilling or removal of any topsoil, sand, gravel, rock, minerals or other materials within the restored Wetland Mitigation Site or in adjacent on-site areas that affect the site. There shall be no plowing or any other activity that would alter the topography of the Wetland Mitigation Site. There shall be no activities undertaken that could threaten or jeopardize the stability or integrity of the planned vegetative zones or slopes.

Dumping or disposal. There shall be no dumping of trash, ashes, garbage or other unsightly or offensive material, including any hazardous or toxic waste. Nor shall there be dumping or depositing of other materials including topsoil if such action would alter the topography, hydrology or planned/established vegetative communities of the Wetland Mitigation Site.

Water. The hydrology of the Wetland Mitigation Site will not be altered in any way that would effectively drain the site or by any means including pumping, draining, diking, impounding or diverting surface or ground water out of the Wetland Mitigation Site except as approved by the Corps of Engineers for the purpose of protecting or maintaining the site's wetland status.

Agricultural Uses. No removal of developing native vegetation, plowing, tilling, brushing, cultivating, crop planting or other agricultural activities may take place within the Wetland Mitigation Site except as may be reasonably required for the management of invasive species or the preservation or maintenance, or enhancement of existing planned vegetative zones, slopes, buffers and stream banks.

Motorized vehicles and watercraft prohibited. There shall be no operation of any motorized vehicles, watercraft, or equipment within the Wetland Mitigation Site, including but not limited to all terrain vehicles, motorcycles, snowmobiles, golf carts, or boats with electric or gas motors. Notwithstanding the foregoing, motorized vehicle operation is permitted as may be reasonably necessary for the management of invasive species or the preservation or maintenance of existing planned vegetative zones, slopes, buffers and stream banks upon twenty (20) days advance written notice to the Corps of Engineers which shall have ten (10) days following receipt of such notice within which to object, in writing, to the proposed motorized vehicle operation.

Vegetation. There shall be no removal, cutting, mowing or alteration of any vegetation or change in the natural habitat in any manner, except that any successors or assigns of the property may, but are not required to, take such steps necessary to remove non-native species, manage wildlife, control noxious weeds, or otherwise maintain the property in a natural state as described in the most recent vegetation survey which shall be prepared prior to any transfer of title.

Enforcement of covenants. Any actions taken by any DOT successor or assign which violate these covenants shall entitle the Corps of Engineers to enter upon the property with respect to which said violation exists and remove, at the expense of the any successor or assigns, owner, lessee or occupant thereof, any structure or condition that may exist which violates the covenants. No lease may be assigned nor any

successor or any new easements granted within the Wetland Mitigation Site without written approval from the Corps of Engineers.

The Wetland Mitigation Sites referred above in these covenants is the 45.23 acres of land more or less, legally described on page 1 of this document.

These conservation covenants and restrictions shall run with and burden the Wetland Mitigation Site in perpetuity and shall bind the any grantees and their heirs, successors, and assigns or lessee.

Executed as of this ____ day of _____, 2020.

Wisconsin Department of Transportation

By: _____

ACKNOWLEDGMENT

STATE OF WISCONSIN)
) ss.
WAUKESHA COUNTY)

Personally came before me this _____ day of _____, 2020, the above named _____, to me known to be the person who executed the foregoing instrument and acknowledge the same.

_____

Notary Public, State of Wisconsin
My commission is permanent.

This instrument drafted by:
Richard Scholze
Wanasek, Scholze, Ludwig, Ekes & Gorn, SC
Burlington, Wisconsin

Appendix B | 2015 WisDOT Wetland Mitigation Site Erosion Problem Memorandum

WISCONSIN DEPARTMENT OF TRANSPORTATION (WDOT) WETLAND MITIGATION SITE EROSION PROBLEM MEMORANDUM



Prepared by:
Ecological Research Partners, LLC.

Prepared for:
Bohners Lake Sanitary District No. 1
(Second Draft 5-20-15)

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WISCONSIN DEPARTMENT OF TRANSPORTATION (WDOT) WETLAND MITIGATION SITE EROSION PROBLEM MEMORANDUM

INTRODUCTION

The Bohners Sanitary District No. 1 has had a long concern about sediment building up in the inlet to Bohner Lake from Spring Brook Creek that enters the Southwest (Figure 1). Spring Brook Creek is also been called the "*Unnamed Tributary*" and "*Bohner Lake Tributary*" in other reports. The Bohners Lake Sanitary District has installed a sediment trap on the inlet to the lake to collect sediment before it enters the waterbody. The purpose of the sedimentation basin is outlined in a study titled ***Bohners Lake Inlet Watershed Study*** prepared by R. A. Smith and Associates, Inc. in 1993. The sediment trap was designed to have a design life of six or more years. The sediment trap and the inlet to the lake was originally dredged in 2002. To create the sediment trap, 1,800 cubic yards of sediment was removed and 800 cubic yards of material was removed from the lake inlet. Within 18 months, the sediment trap and inlet channel filled with organic sediment and have needed maintenance dredging since.



Figure 1

Location of Spring Brook Creek - Tributary to Bohner Lake

During a field reconnaissance in the spring of 2005 to identify potential sources of sediment that caused the rapid filling in of the lake inlet, staff of Hey and Associates, Inc. and Aron and Associates observed large quantities of bed load material of peat moving downstream from a series of agricultural ditches to the south of the lake. The bed load material had a similar characteristic to the material that filled the dredged areas. A follow-up study was conducted to document the source and quantity of sediment that is entering the inlet area and estimate the typical life expediency of the sediment trap. The study, titled ***Bohner Lake Inlet Bed Load Study*** (Hey and Associates, Inc. and Aron and Associates, 2008), estimated that approximately 1,839 cubic yards of bed load material discharges to the lake inlet on an annual basis.

On March 19, 2008 Nick Aron of Aron and Associates and Dr. Neal O'Reilly of Hey and Associates toured Spring Brook Creek to identify potential sources of the organic sediment that was filling in the lake inlet of Bohner Lake. During the survey three sources of sediment were observed:

1. Sediment that had been deposited in the channel bed in the lower stream reaches and had the potential to move under higher flow velocities.
2. Erosion off the Wisconsin Department of Transportation (WDOT) wetland mitigation bank, formally known as the Darrell and Katie Baumeister Farm, was entering the stream through a series of broken tiles and streambank erosion.
3. Erosion of the stream channel upstream of the Baumeister farm.

The results of the field survey on March 19, 2008 indicated that bedload material of peat moving downstream into Bohner Lake is the result of stream bank erosion on the Baumeister Farm and the channel to the south, and erosion of peat from the Baumeister field entering through a series of tile blowouts. In the lower section of the unnamed tributary large deposits of fine sand and peat exist in the channel. The material in the lower sections of the channel are the results of years of active upstream erosion. The deposited material in the channel contains thousands of cubic yards of material that could easily be moved into Bohner Lake during high stream flows. The results of the March 19, 2008 survey was summarized in a Hey and Associates memorandum dated March 25, 2008.

WDOT responded to the Hey and Associates memorandum dated March 25, 2008 in an undated letter in the summer of 2008. The letter summarizes a history of the WDOT mitigation bank and WDOT's restoration. The letter also includes a summary of a field survey conducted by WDOT staff on June 8, 2008. The letter included the following recommendations:

> *"Three drain tile segments still in place and allowing erosion to occur will be removed and backfilled with surrounding soils by WisDOT. A cover crop will be seeded to deter erosion until vegetation becomes reestablished in the areas disturbed by drain tile removal. The work will be contracted this summer or fall, depending on the contractor's ability to access the parcel to do the remediation work.*
>
> *WisDOT recommends that Bohner Lake Sanitary District contact individuals owning property abutting the former Baumeister parcel to determine if work can be done to stabilize eroding stream banks. The unnamed stream located on the south side of the Site enters the drainage ditch and, as such, the drainage ditches surrounding the Site provide drainage for the region. As a result, potential effects on regional drainage should be investigated prior to performing any modifications to the current drainage system."*

WDOT concluded its letter with the following statement:

> *"While we appreciate the shared concern about water quality issues; WisDOT is not responsible for all sedimentation occurring now or the pre-existing 1997 sediment that has accumulated in the stream. WisDOT made a good faith effort to enhance water quality by restoring the Site and the 2006 restoration effort included disablement of numerous tiles that previously drained into the abutting stream and complete revegetation of the Site. WisDOT is not responsible for remedying watershed problems other than what is originating from within our mitigation site boundaries."*

In 2011 the Sanitary District hired Baxter & Woodman, Inc. to conduct a follow-up sediment transport study titled, ***Bohners Lake Sanitary District Bohners Lake Tributary Sediment Loading Study*** (Baxter & Woodman, Inc., December 2011). The purpose of the study was to see "if changes of land use within the watershed, notably the conversion of agricultural practices to wetland

conditions at the Baumeister property, affected the sediment loading rates to Bohners Lake." Baxter & Woodman concluded that total suspended sediment levels had dropped from the 2008 Hey and Associates, Inc. and Aron and Associates study. No bed load sampling was conducted. Unfortunately, the Hey and Associates, Inc. and Aron and Associates study had already documented that the suspended sediment was not a major cause of the sediment entering Bohners Lake. Therefore, the sediment sampling provided no new valuable information.

A survey of stream bank erosion was conducted and is illustrated in Figure 2. The Baxter & Woodman survey found similar results the March 19, 2008 Hey and Associates survey, with most of the stream channel on the WDOT wetland mitigation site having moderate to severe erosion. The report also evaluated several "Mitigation Opportunities" including:

- Maintenance Dredging of the inlet and sedimentation basins
- Streambank Stabilization
- Remove Debris
- Stream Restoration
- Riparian Corridor Vegetation Management
- Stormwater Best Management Practices Outside of the River Corridor

The recommendations of the Baxter and Woodman study included:

- Continue to monitor the soil erosion rods to document rate of lateral recession of the streambank.
- Continue to monitor sediment deposition rates at the Bohners Lake Inlet. Place a staff gage at the sediment basin to record sediment depths over time. Remove sediment when the sediment basin is approximately 50 percent full to maximize trapping effectiveness of bed load sediment.
- Stabilize the outlet from the Baumeister Wetland Site to prevent future erosion of soils.
- Educate property owners about riparian corridor management so that they may make informed decisions about actions to improve soil erosion/sediment control and the environment.

- Explore the establishment of a cost-share program between BLSD and other interested parties and Tributary property owners to fund riparian corridor restoration opportunities. Potential projects to fund include streambank stabilization and stream restoration projects.
- Discuss with DNR options to reduce sediment loads and meet permit conditions.


N
BOHNER'S LAKE INLET
BOHNER'S LAKE
EROSION ROD
BOHNER LAKE ROAD
FISHMAN ROAD
DRIVE
WETLANDS
BAUMEISTER WETLAND
TILE BLOW-OUT EROSION RODS
BOHNER'S LAKE TRIBUTARY
SEEPS/SPRINGS
WETLANDS
DYER LAKE
LEGEND
SLIGHT TO MODERATE EROSION
MODERATE EROSION
MODERATE TO SEVERE EROSION
SOURCE: AERIAL IMAGERY FROM KENOSHA, RACINE AND WALWORTH COUNTIES.
BAXTER & WOODMAN
Consulting Engineers
Baxter & Woodman
Crystal Lake, Illinois 815.459.1200
Nakena, Illinois 708.478.2090
Burlington, Wisconsin 262.763.7934
DeKalb, Illinois 815.787.3111
Grayslake, Illinois 847.223.5086
Plainfield, Illinois 815.609.7425
Itasca, Illinois 630.773.1870
Madison, Wisconsin 608.241.5481
Chicago, Illinois 312.578.0500
BOHNER'S LAKE SANITARY DISTRICT
BOHNER'S LAKER TRIBUTARY
AERIAL
DESIGNED BY TEG
SCALE NONE
DRAWN BY TLB
PROJECT NO. 100868.30
CHECKED BY TLB
SHEET NO.
DATE 12-1-11
FIG. 3

Figure 2

Stream Bank Erosion Survey by Baxter & Woodman April 1, 2011

To test the ability of native plant plugs to stabilize erodible streambank locations along the Spring Brook tributary to Bohners Lake (aka Bohners Lake Tributary) at the Baumeister Wetland Mitigation Site, two dormant rootstocks (prairie cord grass and bluejoint grass) were planted at four test plots along the stream on October 18, 2013. These four test plots, plus a control site with no planting, were observed on July 16, 2014. A summary of the observations is outlined in a July 21, 2014 memo from Baxter & Woodman.

The memo concluded that "*the planted grass plugs showed some success along the toe of slope, but were not successful along the bankslope above the toe of slope. Potential reasons for lack of success on the bankslope include lack of moisture, competition from other plants (e.g., shading), and herbivory*."

ECOLOGICAL RESEARCH PARTNERS FIELD SURVEY

On December 26, 2014 Dr. Neal O'Reilly Ecological Research Partners and Eric Oldenberg of the Sanitary District conducted a field survey of the streambanks along the WDOT wetland mitigation site. The site visit identified the following conclusions:

1. Erosion along the west bank of the main agricultural drainage channel on the WDOT wetland mitigation site was still actively eroding. Bank conditions appeared similar to what was observed during the previous March 19, 2008 survey. The west bank was steep with a 0.6 to one slope (Figure 3). Peat was observed to be actively slumping into the stream channel.
2. The east bank of the channel appeared to be in a more stable condition that the west bank. The side slopes were more gentle and a terrace was beginning to form at the toe of the bank (Figure 4).
3. Peat material was observed moving along the bottom of the channel. A bed load sample was collected at Fishman Road using the same techniques used in the ***Bohner Lake Inlet Bed Load Study*** (Hey and Associates, Inc. and Aron and Associates, 2008). The sample collected 14.6 grams of peat material in 5 minutes for an input rate of 4,165 grams/day (3,351 pounds/year). It should be noted that this sample was collected during very low base flow as the month of December had lower than normal precipitation. The sample did however indicate that movement of peat material is still a problem.

4. The tile blowouts observed in 2008 were not observed and appear to have been repaired.
5. The October 18, 2013 plantings by Baxter & Woodman were still in place at the toes of the bank, but had not taken on the steep side slopes of the channel.



**Figure 3
Active Erosion along the West Bank of the Main Agricultural Channel along the WDOT Wetland Mitigation Site**



**Figure 4
Terrace forming along the toe of the East Bank of the Main Agricultural Channel Adjacent the WDOT Wetland Mitigation Site**

6. No observations were made of the channel south of the WDOT site, however it is assumed that this area is still a source of peat sediment to the drainage channel.

SPRING BROOK TRIBUTARY WATERSHED

The Spring Brook Creek also called the "Unnamed Tributary" and "Bohner Lake Tributary" in other reports, is important to understand as it is the source of water that moves sediment downstream. The tributary area is shown in Figure 5. The tributary land use is summarized in Table 1. A summary of annual flow using the L-THIA SWAT model developed by Purdue University is summarized in Table 2. The 2-year and 10-year flows were estimated by the model as 40 and 56 cfs respectively.

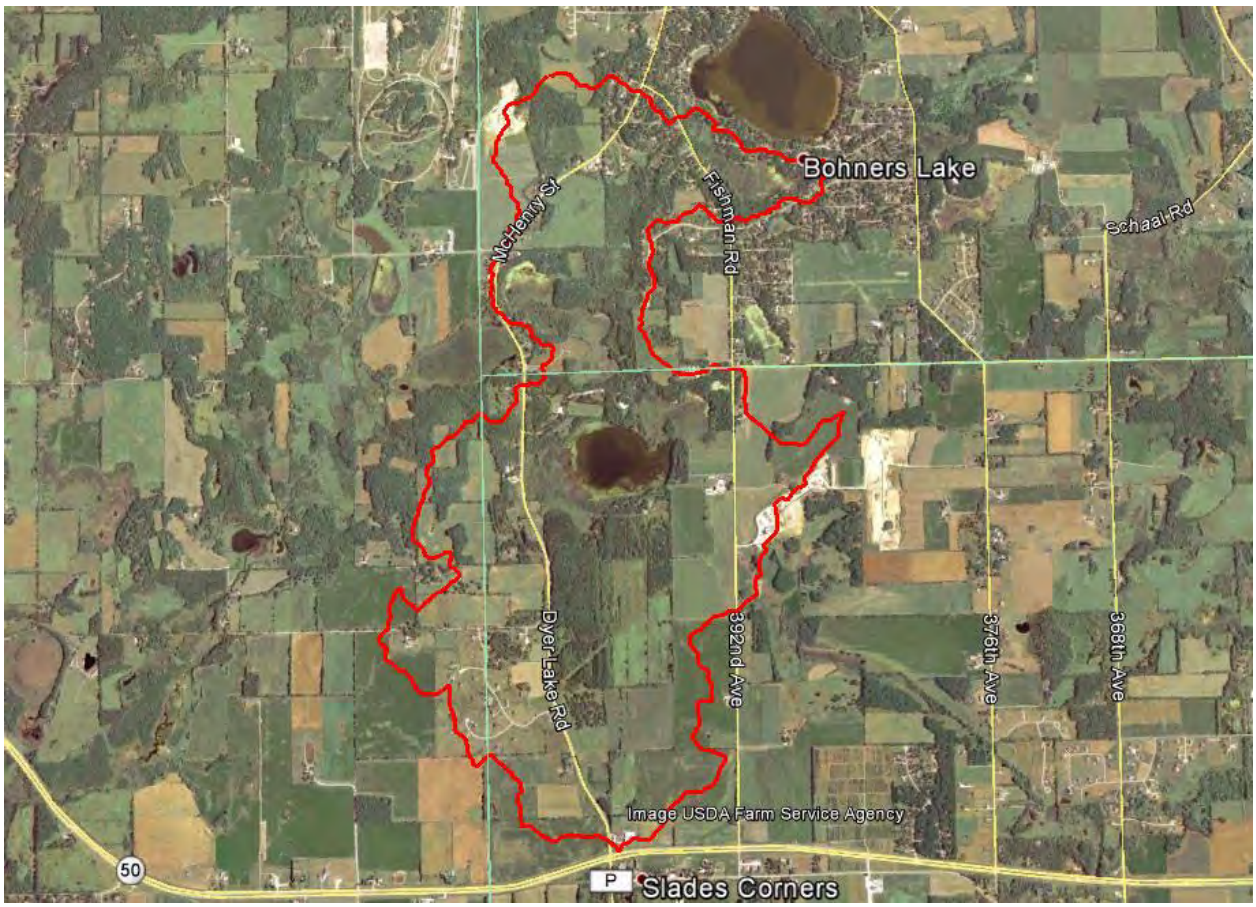


Figure 5
Spring Brook Tributary Area

Table 1
Land Use in Spring Brook Tributary to Bohners Lake

Land Use	Acres
Agriculture	659.4
Forest	629.1
Grass/Pasture	270.9
Water/wetlands	84.6
LD-Residential	113.9
HD-Residential	94.8
Industrial	7.6
Total	**1860.3**

Table 2
Annual Runoff to Spring Brook Tributary of Bohners Lake
(Method: L-Thia SWAT Model)

Land Use	Hydrologic Soil Group	Area (acres)	Curve Number	Average Annual Runoff Volume (acre-ft)
Water/Wetlands	B	2.9	0	0
Water/Wetlands	D	81.7	0	0
Agricultural	A	0.9	64	0.6
Agricultural	B	491.2	75	449.28
Agricultural	C	31.3	82	35.85
Agricultural	D	136	85	171.35
High Density Residential	B	84.2	85	106.08
High Density Residential	C	2.7	90	4.27
High Density Residential	D	7.9	92	13.87
Low Density Residential	B	96	70	76.33
Low Density Residential	C	2.9	80	3.1
Low Density Residential	D	15	85	18.89
Grass/Pasture	B	219.3	61	136.87
Grass/Pasture	C	3.7	74	3.25
Grass/Pasture	D	47.9	80	51.36
Forest	B	427.8	55	222.98
Forest	D	201.3	77	194.81
Industrial	A	5.1	81	5.57
Industrial	B	1.4	88	2.01
Industrial	C	0.9	91	1.47
Industrial	D	0.2	93	0.36
	Total Annual Volume (acre-ft)			**1498.41**
	Average Annual Runoff Depth (in)			**9.66**
	Average Annual Rainfall Depth (in)			**43.51**

Channel Evolution Model

Stream channels after they are disturbed by channelization, like the drainage channel adjacent to the WDOT wetland mitigation site, will go through an evolutionary process to heal themselves. This process is called the "**channel evolution model**" (CEM) (Schumm, Harvey, and Watson 1981)
The channel evolution model describes a predictable sequence of change in a disturbed channel system as it attempts to restore itself. The value of the CEM is that it gives us a view of what state of recovery the stream is in, helps predict how much further it must go before it again becomes stable, and helps us to identify how we can accelerate the stabilization process through management. The concept and the stages of stream recovery are illustrated in Figure 6.

The stages of the channel evolution model include:

1. **Stage I (Stable):** is a natural channel before modification. At this stage the banks and bed of the channel are stable with minimal erosion. The stream has an intact floodplain and flows greater than the one and half to two year storm overtop the banks. The stream bank height (h) is below the critical height (hc). Critical height hc is that height above which the banks have high potential of collapsing by gravitational forces.

2. **Stage II (Disturbance):** represents the stream channel morphology directly after human activity such as channel straightening. As a result the banks now can hold stream flow discharge greater than the 2-year storm and cross-sectional area needed to carry the flow is too small so the stream begins to down cut to increase its flow capacity. As the stream down cuts, the height of the stream banks increases to higher than critical and are highly susceptible to slumping.

3. **Stage III (Widening):** The extensive increase in bank heights (higher than the critical height) of the channel leads to excessive stream bank instability. The banks start collapsing and the stream starts widening. These streams are extremely deep and wide. Most of the sediment slumped off the banks is still moving downstream.

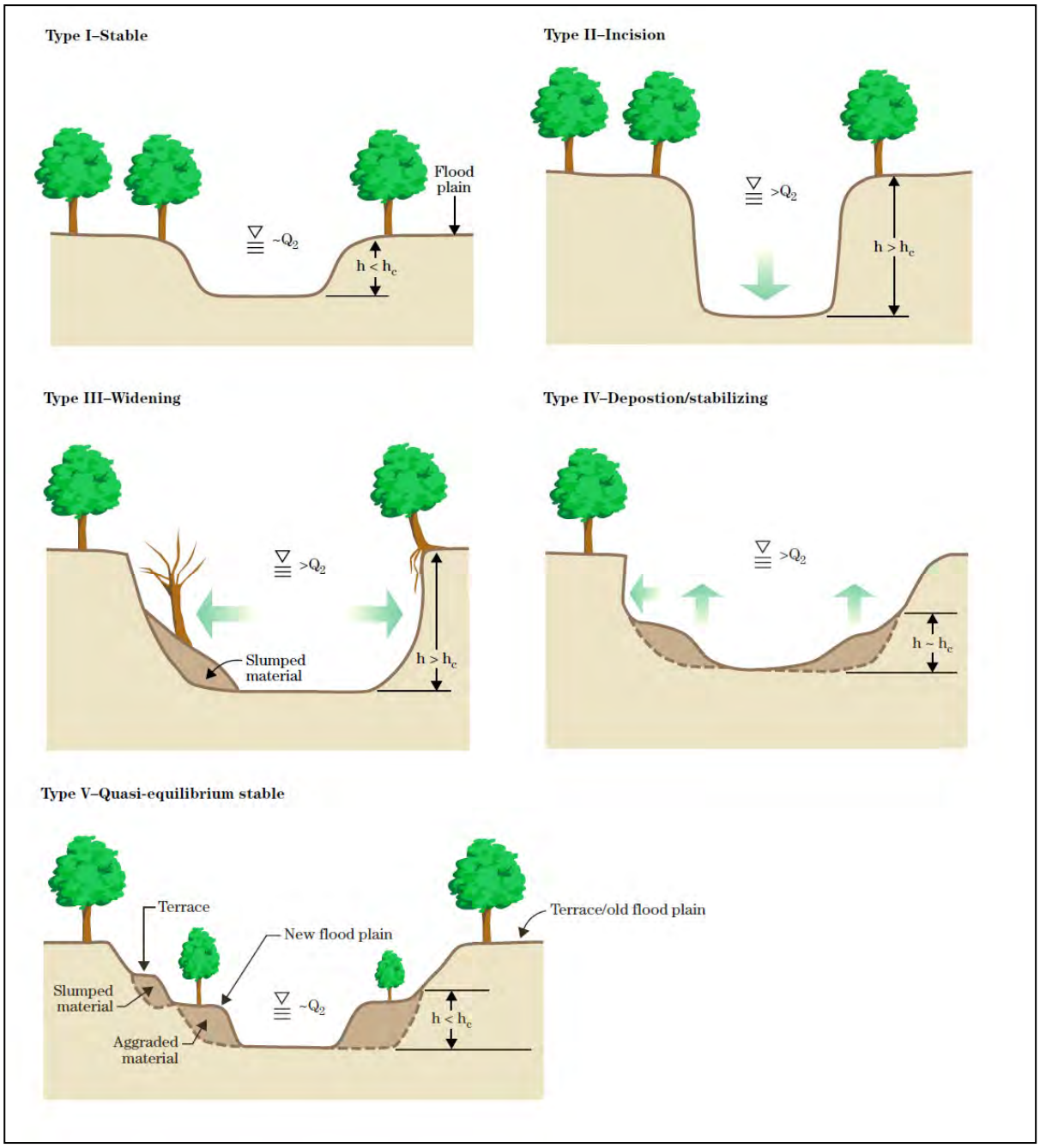


Figure 6
Schumm, Harvey, and Watson (1981) schematic cross sections and longitudinal profile of an incised stream showing features of the five classes of the CEM

4. **Stage IV (Stabilizing):** Excessive sediment deposition from the stream banks in the channel makes it impossible for the stream flow discharge to remove all of it. At this phase the stream begins to lay down alluvial deposits and a flood plain begins to form. The stream bank height starts decreasing (typically equals the critical height). Vegetation starts growing on the sloughing material that is not removed. A new lower capacity stream channel is formed.

5. **Stage V (Stable with terraces):** A new channel develops and the new banks have heights shorter than the critical bank height. The new floodplain is connected with the stream. Terraces are the remnants of the original floodplain.

The process of evolution from the initial disturbance to stage V, where the stream has healed itself, can take decades. During the healing process large amounts sediment are moved down stream.

The main stream channel on the east side of the WDOT wetland mitigation site is in stage III transiting to stage IV. The on the west bank the channel is still in stage III with steep almost vertical banks with active erosion (see Figure 3). In the photo in Figure 3 we see the steep bank that is almost vertical. The east side of the channel is transiting in two Stage IV (see Figure 4). In Figure 4 we see on the east bank a vegetated sediment terrace has formed which has begun to heal that bank.

The soils on the WDOT wetland mitigation bank are Houghton Muck (Figure 7). Houghton muck is in part black or dark-brown finely divided well-disintegrated muck, containing a trace of fibrous material from the roots of the present vegetation. The soil is a type of peat soil. Table 3 summarizes the typical angle of repose for selected soils taken from the Structural Engineer's Pocket Book (Fiona Cobb, 2009). The angle of repose indicates the slope which the sides of an excavation in the soil may stand at without slumping. As we see the angle of repose for peat ranges from 15 degrees for dry soil to 45 degrees for wet soils. On the WDOT side of the main drainage channel the banks have slide slope of greater than 1 to 0.67 or greater than 56 degrees, making them very unstable under both dry and wet conditions.

Table 3
Typical Angle of Repose for Selected Soil Types

Soil Type	Dry Soils		Wet Soils	
	Description	Typical Angle of Repose (degree)	Description	Typical Angle of Repose(degree)
Top Soil	Loose and Dry	35-40	Loose and Saturated	45
Loam	Loose and Dry	40-45	Loose and Saturated	20-25
Peat	**Loose and Dry**	**15**	**Loose and Saturated**	**45**
Clay/Silt	Firm	17-19	Puddle clay	15-19
Sand	Compact	35-40	Saturated	25
Gravel	Dry	35-45	Loose	40

Source: Structural Engineer's Pocket Book (Fiona Cobb, 2009).



Figure 7
Soils in the Area of the WDOT Wetland Mitigation Bank

MANAGEMENT ALTERNATIVES

Management alternatives for the stream banks on the WDOT wetland mitigation site fall into three categories:

1. Do nothing
2. Trap sediment downstream
3. Vegetation techniques
4. Re-slope and stabilize the banks
5. Installation of an underground pipe & re-slopeing of the banks

Do Nothing

Under the do nothing alternative the Sanitary District would continue to allow the channel banks to stabilize on their own through the channel evolution process outlined above. The channel banks would be allowed to continue to erode and the sediment would be allowed to enter the inlet to Bohners Lake. Periodic dredging of the inlet would need to continue. The original drainage channel was installed over one half of a century ago, the ultimate stabilization of the channel will likely take several more decades to be achieved.

Trap Sediment Downstream

Under the trap sediment downstream alternative the Sanitary District would continue to operate a series of sedimentation basins downstream between the WDOT site and the lake. The alternative is outlined in the ***Bohners Lake Sanitary District Bohners Lake Tributary Sediment Loading Study*** (Baxter & Woodman, Inc., December 2011). As stated in the report:

> *"Continue to monitor sediment deposition rates at the Bohners Lake Inlet. Place a staff gage at the sediment basin to record sediment depths over time. Remove sediment when the sediment basin is approximately 50 percent full to maximize trapping effectiveness of bed load sediment."*

Experience shows that these basins will need to be cleaned out at least every two years. The cost of this action would become a continued expense to the district.

Vegetation Techniques

Under this alternative establishment of vegetation of the un-stable banks would be attempted. Native root stock would be planted into the banks as plugs. Plugs would be used versus seed to improve the potential for the plants to take. Baxter & Woodman attempted this technique in October of 2013, with results outlined in a July 21, 2014 memo. While this technique worked on the toe of the bank, it did not take on the steep side slopes which have unstable soils. While this technique could be used to help hold sediment terraces in place, long-term will not address the issue that the west bank of the channel is too steep and the channel cross-section has not reached equilibrium with its watershed.

Re-slope and Stabilize the Banks

Reestablishment of artificial agricultural drainage channel is difficult due to the loss of the historic floodplain and usually a limited corridor to work within. Natural channels have wide floodplains. In the past the floodplain for Spring Brook Creek was likely the entire Baumeister Farm. The stream likely flowed through a wide wetland valley. When the farmer installed the drain tiles on the property he had to deepen the steam to allow for gravity outlets. Today the stream sits six to eight feet lower than its original elevation.

The U. S. Department of Agriculture's Natural Resource Conservation Service (NRCS) has developed a specialized channel that can be used in situations where we have a corridor too narrow to establish a natural alluvial channel, but has some of the characteristics of a natural channel that allows it to be stable. The channel is called a ***"Two Stage Channel"*** (NRCS, August 2007).

A two stage channel is a concept which incorporates benches that function as flood plains and attempts to restore or create some natural alluvial channel processes. However, these two-stage channels are not an exact copy of natural streams, as the width of the benches is often small due to the confining geometry of the constructed channel. This two-stage approach provides improved physical, as well as ecological performance. The channel-forming discharge channel provides the necessary sediment conveyance, while the flood plain channel provides for the design flood conveyance. By nesting the channel forming discharge channel within the larger channel, the entire waterway is more stable (See Figure 8). Experience shows that channel stability may be improved by

a reduction in the erosive potential of larger flows as they are shallower and spread out across the bench which is dryer and allows vegetation to be established.

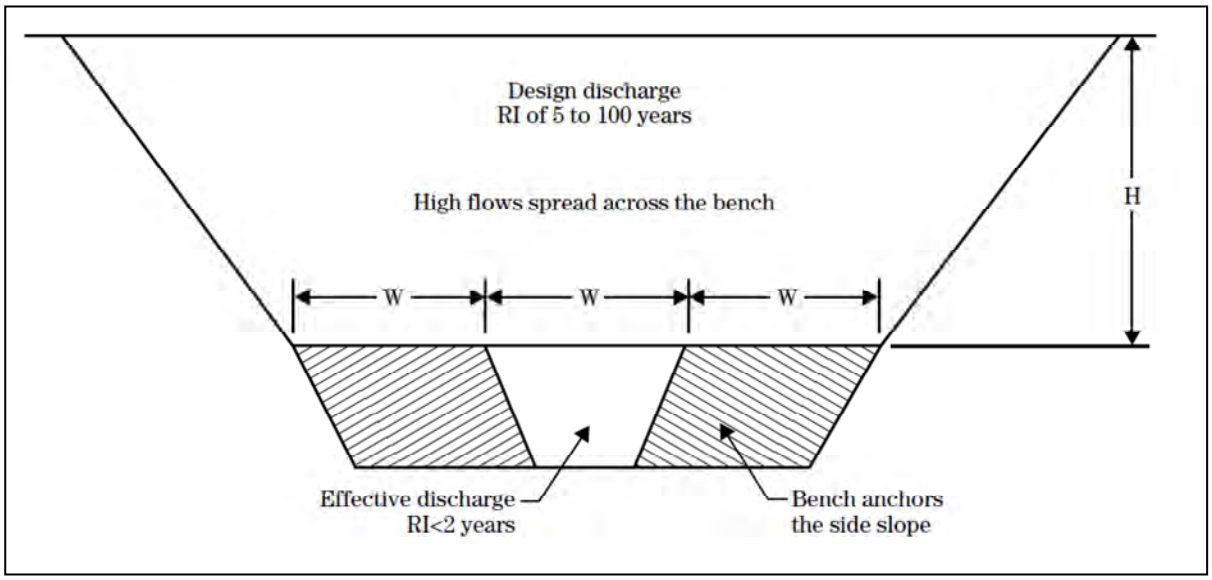


Figure 8
Concept of Two Stage Channel

Stability of the ditch bank should be improved where the toe of the ditch bank meets the bench, rather than the ditch bottom. Here the water depth is effectively reduced, and the shear stress (erosive force) on the toe of the bank is less. Also, not being in contact with low flow, this bank material will be drier and can be stabilized with vegetation. The two-stage ditch also has the potential to create and maintain better habitat than a conventional trapezoidal ditch.

The NRCS has developed a software package that can help with the preliminary design of a two stage channel. Using this software a two stage channel for the WDOT site was designed and is illustrated in Figure 9.

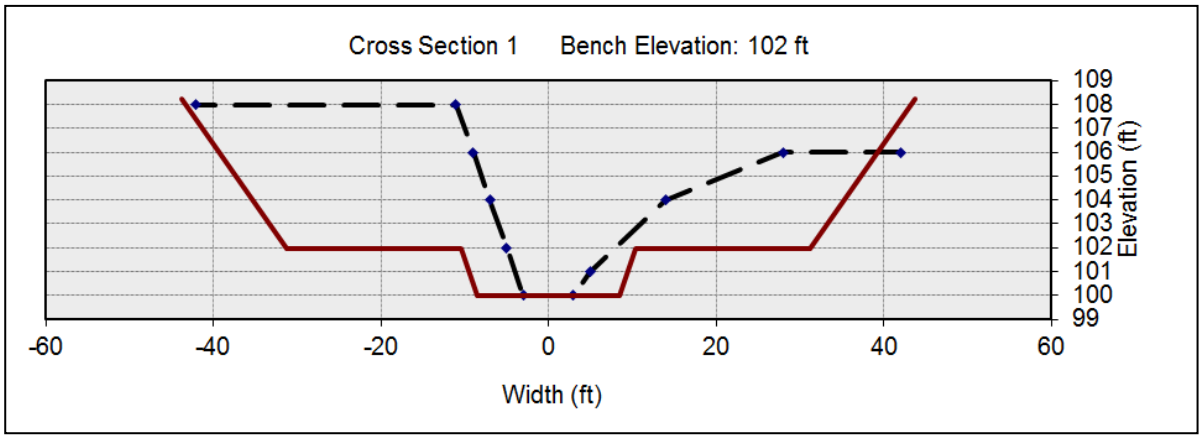


Figure 9
Two Stage Channel Design for the WDOT Wetland Mitigation Site on Spring Brook Creek

The channel is 87 feet wide at its top width. The low-flow channel is approximately 21 feet wide, and floodplain benches are approximately 21 feet wide each. The existing cross-section of the existing channel at one location near the middle of the property is shown on Figure 9 in the black dashed line.

To create this channel, 170.6 square feet of material would be needed to be removed from the west bank and 78.5 square feet from the east bank. To establish this channel on the 1,300 feet from the outlet of the WDOT site to the southern property boundary (see Figure 10) would require 221,780 cubic feet (8,214 cubic yards) of material to be removed on the west bank and 102,102 cubic feet (3,781cubic yards) to be removed on the east bank, for a total 323,882 cubic feet (11,995 cubic yards).



Figure 10
Location of Potential Channel Stabilization at WDOT Wetland Mitigation Site

If the channel was centered on the property line, 68 percent of the work would be on the WDOT site and 32 percent would be on the property of the eastern neighbors. The eastern neighbors include the properties:

- *ANN M HALEY, FISHMAN RD*
- *JOHN K & JULIE J VOEGELI, 8686 COUNTRY VIEW LN, BURLINGTON*
- *ROBERT F & LAURI S PILESKI, 8700 COUNTRY VIEW LN, BURLINGTON*
- *DANIEL L & PATRICIA A WALRATH, 8710 COUNTRY VIEW LN, BURLINGTON*

Under the Restrictive Conservation Convents recorded with the deed on the WDOT wetland mitigation site there are several covenants that would affect a potential channel stabilization project (Exhibit A). These convents include:

> ***Topography.*** *There shall be no dredging, filling, excavating, mining, drilling or removal of any topsoil, sand, gravel, rock, minerals or other materials within the restored wetland area or in adjacent on-site areas that affect the site. There shall be no plowing or any other activity that would alter the topography of the Wetland Mitigation Site. There shall be no activities undertaken that could threaten or jeopardize the stability or integrity of the planned vegetative zones, or slopes.*

Dumping or disposal. *There shall be no dumping of trash, ashes, garbage or other unsightly or offensive material, including any hazardous or toxic waste. Nor shall there be dumping or depositing of other materials including topsoil if such action would alter the topography, hydrology or planned/established vegetative communities of the Wetland Mitigation Site.*

Water. *The hydrology of the Wetland Mitigation Site will not be altered in any way that would effectively drain the site or by any means including pumping, draining, diking, impounding or diverting surface or ground water out of the Wetland Mitigation Site except as approved by WisDOT and the Corps of Engineers for the purpose of protecting or maintaining the site's wetland status.*

The above convents would prevent any of the material removed to stabilize the drainage channel from being placed on the WDOT property. This will mean that any soil removed would have to be hauled off-site. Hauling the material off site would add dramatically to the cost of any project. Since a potential disposal site is unknown at this time estimating of a project cost is difficult. However the cost of the project could range from $125 to $300 per lineal foot of bank. Treating both sides of the channel would require 2,600 feet of bank of be stabilized at an estimated costs of $325,000 to $780,000. It should be noted that these are crude costs based on one stream cross-section, a preliminary hydraulic analysis, and unknown disposal costs.

One option that could be explored to reduce the disposal site would be to see if the WDOT, Wisconsin Department of Natural Resource, and U. S. Army Corps of Engineers would allow the convents to be modified to allow sediment to be deposited in the abandoned drainage channels on the west and south side of the mitigation site as shown in Figure 11. If used, material would only be placed to an elevation that matched the adjacent wetland and would restore these areas of the wetland to approximately their original grade.



Figure 11
Potential Disposal Sites on WDOT Mitigation Site

Installation of an Underground Pipe Re-slope of the Banks

An alternative to the channel re-sloping and stabilization outlined above would be enclose the base flow channel in a pipe and allow storm flows to flow through an overflow channel. Under this option the continuous base flow would be safely passed through a pipe and have no contact with the highly erodible soils on the WDOT mitigation site. To assure the pipe would not frost heave it would require 2 to 3 feet of soil cover. Above the pipe cover a high flow channel could be established to carry large storm flows. The concept is illustrated in Figure 12. As we see under this concept the banks of the stream channel are significantly reduced in height, reducing the potential for slumping.

If we assume we need a 36-inch pipe with manholes every 200-feet for cleanout access, the cost of the pipe installation would be between $150,000 and $250,000 depending if corrugated metal pipe (CMP) or round concrete pipe (RCP) is used.

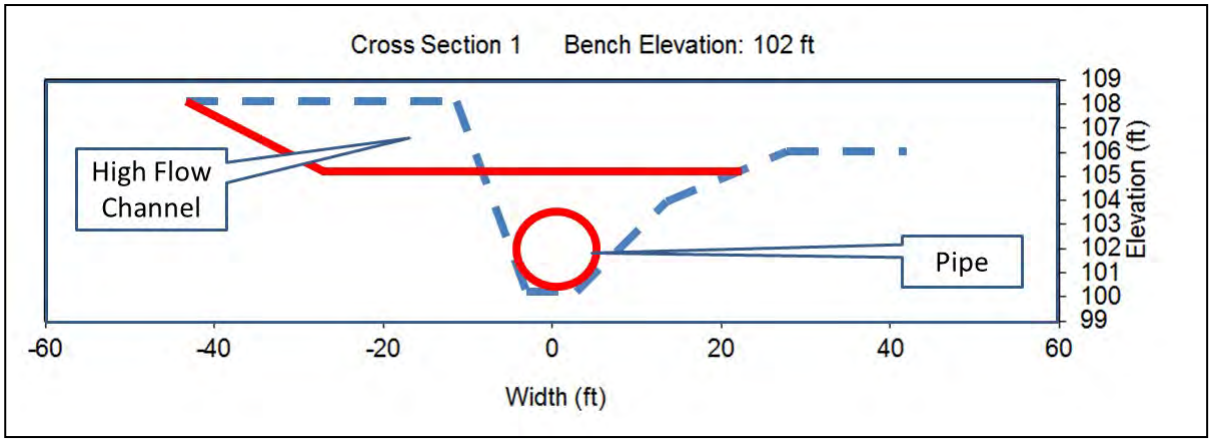


Figure 12
Concept of Low Flow Pipe

The concept would require that several regulatory and engineering issues be addresses. First, the design will have to address the flat slopes in the bed of the current channel which could facilitate sediment deposition in the pipe. The pipe will need to be designed to maintain design velocities of 2- to 3-fps to assure frequent scours and prevent frequent maintenance. The second issue that will have to be addressed will be the potential impacts on the 100-year regulatory floodplain. Partially filling in the channel to accommodate the pipe and its associated fill will consume part of the existing flood flow capacity of the channel and could increase regulatory flood elevations on the adjacent properties. Under Wisconsin Administrative Code NR 116 any increase in the regulatory flood elevation greater than 100th of a foot requires an easement from the affected property owners. More detailed engineering design will be required to determine if this alternative is feasible and cost effective.

RECOMMENDATIONS

It is clear that the do nothing alternative would result in continued degradation of Bohners Lake. That while the use of the inlet sedimentation basins is providing benefits of trapping sediment before it reaches the lake it comes with a continued cost that will likely be needed for decades. The long-term solution would be stabilization of the eroding channel banks.

Ecological Research Partners recommends that the Sanitary District explore a partnership with WDOT to stabilize the banks either through re-sloping the banks or installing an under drain pipe system. It is unlikely, based on past correspondence that WDOT that they will help financially with the project, but as the land owner would need to provide permission to access the land. The Sanitary District could explore funding for the project through the Racine County Land Conservation Department and the U. S. Department of Agriculture's Natural Resource Conservation Service. Permission from the neighbor to the east would also be required to implement any project.

Ecological Research Partners recommends that a series of meetings be scheduled with WDOT, Wisconsin Department of Natural Resources, Racine County Land Conservation Department, Natural Resource Conservation Service and the eastern neighbors to start the discussion of a potential project. A recommended schedule of events would be as follows:

1. Schedule a site visit with WDOT, Wisconsin Department of Natural Resources, U. S. Army Corps of Engineers, Racine County Land Conservation Department, Natural Resource Conservation Service, and Sanitary District to develop consensus that a problem exists and a solution needs to be collectively found.
2. Work with Racine County Land Conservation Department, Natural Resource Conservation Service to develop a management plan and explore funding options.
3. Reconvene the government agencies and invite the eastern neighbors to a meeting to determine if the proposed project could move forward.
4. If there is a consensus on the project by the stakeholders permits for the project from Racine, Wisconsin Department of Natural Resources, and U. S. Army Corps of Engineers would be applied for.
5. Grant applications would be prepared.
6. Intergovernmental agreements would need to be initiated.
7. Construction plans and drawings would need to be prepared.
8. The project would need to be publicly bid.

REFERENCES

Baxter & Woodman, Inc., (December 2011). ***Bohners Lake Sanitary District Bohners Lake Tributary Sediment Loading Study***, Burlington, WI.

Hey and Associates, Inc. and Aron and Associates, (2008), ***Bohner Lake Inlet Bed Load Study***, Brookfield, WI.

R. A. Smith and Associates (1993). ***Bohners Lake Inlet Watershed Study***, Brookfield, WI.

Schumm, S.A., M.D. Harvey, and C.A. Watson. 1984. ***Incised channels, morphology, dynamics, and control***. Water Resourc. Publ., U.S. Library of Congress. Catalog Number 83–050243. Littleton, CO. 200 pp.

EXHIBIT A

WisDOT WETLAND MITIGATION SITE

RESTRICTIVE CONSERVATION COVENANTS

Inspection. The right of the Wisconsin Department of Transportation (DOT), its contractors, agents and invitees, the Wisconsin Department of Natural Resources (DNR), and the Army Corps of Engineers (COE) to enter the Wetland Mitigation Site, in a reasonable manner and at reasonable times, for the purpose of inspecting the Wetland Restoration Site which serves as Mitigation for the Burlington Bypass. To determine if any successor or assigns is complying with the conservation covenants listed below. Further reserve the right of representatives of the above named entities to observe, study, record, make scientific studies and educational observations, and to allow for a harvest of common wetland plant seed and root stock (not including state and federal listed threatened and endangered species) for replanting on the Wetland Mitigation Site and other WisDOT wetland restoration sites or projects if the activity does not threaten the long term establishment and density of native vegetation and seed bank.

Covenants.

WisDOT imposes the following restrictive conservation covenants that shall run with and bind the Wetland Mitigation site in perpetuity. These covenants apply to restoration and non-restoration acreage within the legal description and include but limited to upland prairie buffers, stream banks, existing wetlands, and wetland restoration acreages.

Uses. There shall be no commercial, industrial, residential or other incompatible activities undertaken or allowed within the Wetland Mitigation Site.

Buildings and Structures. There shall be no buildings, dwellings, barns, roads advertising signs, billboards or other structures built or placed in the Wetland Mitigation Site or in trees except structures essential to maintaining the site or structures such as interpretive signs or other additions that enhance the public's use of the site can be installed with written approval from WisDOT.

Topography. There shall be no dredging, filling, excavating, mining, drilling or removal of any topsoil, sand, gravel, rock, minerals or other materials within the restored wetland area or in adjacent on-site areas that affect the site. There shall be no plowing or any other activity that would alter the topography of the Wetland Mitigation Site. There shall be no activities undertaken that could threaten or jeopardize the stability or integrity of the planned vegetative zones, or slopes.

Dumping or disposal. There shall be no dumping of trash, ashes, garbage or other unsightly or offensive material, including any hazardous or toxic waste. Nor shall there be dumping or depositing of other materials including topsoil if such action would alter the topography, hydrology or planned/established vegetative communities of the Wetland Mitigation Site.

Water. The hydrology of the Wetland Mitigation Site will not be altered in any way that would effectively drain the site or by any means including pumping, draining, diking, impounding or diverting surface or ground water out of the Wetland Mitigation Site except as approved by

WisDOT and the Corps of Engineers for the purpose of protecting or maintaining the site's wetland status.

Agricultural Uses. No removal of developing native vegetation, plowing, tilling, brushing, cultivating, crop planting or other agricultural activities (with the exception of planting native plants to enhance the site or invasive species management) may take place within the Wetland Mitigation Site.

Recreational motorized vehicles and watercraft prohibited. There shall be no operation of any motorized vehicles, watercraft, or equipment within the Wetland Mitigation Site, including but not limited to all terrain vehicles, all motorcycles, snowmobiles, golf carts, or boats with electric or gas motors. The exception would include equipment needed for the management of invasive species and/or to enhance existing planned vegetative zones.

Vegetation. There shall be no removal, cutting, mowing or alteration of any vegetation or change in the natural habitat in any manner, except that WisDOT or any successor, or assigns of the property may take such steps necessary to remove non-native species, manage wildlife, control noxious weeds, or otherwise maintain the property in a native state.

Enforcement of covenants. Any actions taken by any successor or assigns which violate these covenants shall entitle WisDOT or the Corps of Engineers the right to enter upon the property with respect to which said violation exists and remove at the expense of the any successor or assigns, owner, lessee or occupant thereof, any structure or condition that may be or exist thereof contrary to the intent and meaning of the covenants. Any lease cannot be reassigned and any successor or assigns shall not allow new easements within the Wetland Mitigation Site without written approval from WisDOT and the COE.

The Wetland Mitigation Sites referred above in these covenants is the 45.23 acres of land described on page 1 of this document.

These conservation covenants and restrictions shall run with and burden the -Wetland Mitigation Site in perpetuity and shall bind the any grantees and their heirs, successors, and assigns or lessee.

Appendix C | 2004 Lake Bohner Aquatic Plant Management Plan



Bohners Lake Aquatic Plant Management Plan 2004

Aron & Associates
30910 Royal Hill Rd.
Burlington, WI 53105
262-514-3234

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Chapter I

INTRODUCTION

In 1989 the State of Wisconsin enacted the Lake Management Planning Grant program. The program was designed to provide cost-sharing assistance and incentives to local communities because they are the front line for lake management activities. The development of this Aquatic Plant Management Plan is one part of a continued effort by local residents to improve Bohners Lake. Bohners Lake is a 135 acre lake located in the Town of Burlington, Racine County, Wisconsin. The lake has a maximum depth of 30 feet and 1.9 miles of shoreline. The land area immediately surrounding the lake is primarily residential.

The Bohners Lake Improvement Association was formed more than 25 years ago to protect and enhance the quality of Bohners Lake. Because support was lagging as costly management activities were increasing, the community looked for a more stable way of managing Bohners Lake. When the Bohners Lake Sanitary District (District) assumed lake district powers under Wisconsin Statutes Chpt. 33, the Association assets were then turned over to the District and the Association was dissolved. All lake management activities are now handled by the District. To manage the day-to-day activities of the lake, the District created a committee to interact with the public, conduct meetings, develop action plans, and implement the plans. The committee includes landowners from both on and off the lake, as well as representatives from the District and the Town of Burlington.

Over the years, the community has worked with a number of consultants, with the Wisconsin Department of Natural Resources (WDNR), and Southeastern Wisconsin Regional Planning Commissioner (SERPC) in their efforts to protect and rehabilitate Bohners Lake. Watershed surveys, water quality monitoring, volunteer monitoring, well water sampling, dredging, goose control, plant management, and other lake management efforts have been undertaken by the District. In 2002, the District hired Aron & Associates to conduct an aquatic plant survey and re-evaluate the plant management plan that was originally developed in 1996.

PUBLIC INTERACTION

The plant management plan was developed by Aron & Associates, in cooperation with the Bohners Lake Sanitary District, the Committee, the WDNR, and the public. Public input and historical records were an important part of the development of this plan. Discussions, comments, and communications received over the past 5 years, were considered in the development of this plan. Comments and information were solicited from:

- residents and board members,
- lake users,
- community meetings,
- WDNR resource managers,
- WDNR records, and
- SEWRPC records.

The District intends to use this plan to guide future plant management decisions, and to educate the residents on the merits of the issues addressed in the plan.

GOALS & OBJECTIVES

The difficult task facing those who attempt to manage their lake is that user needs often conflict. Fish and wildlife need aquatic plants to thrive. Boaters and swimmers desire relief from nuisance aquatic plants. Those depending on the lake for "aesthetic viewing" desire an undisturbed lake surface.

The goals of the District, broad statements, are outlined below. The goals are followed by more defined objectives to be used to accomplish each of the goals.

The District's goal is to optimize the preservation and enhancement of aquatic systems that includes water quality, fisheries, and wildlife while minimizing the conditions resulting from aquatic nuisances and to preserve and maintain recreational uses of Bohners Lake. To achieve the goal, the development of this plan is one component of an effort that has included water quality monitoring, community surveys, aquatic vegetation surveys, and wetland inventories.

The District desires to (listed in order of local importance):

- Control exotic and nuisance plant species. by:
  - —use of chemical treatments of nuisance species at least once per season.
  - —contract-harvesting between 40 and 80 hours per season.
  - —encouraging landowners to protect native species.
- Preserve and enhance the natural lake environment by.
  - —educating landowners and lake users in lake ecology.
  - —working with local governments to develop and enforce ordinances to protect Bohners Lake.
  - —continuing to monitor the DOT wetland restoration project within the watershed.
- Identify and expand local educational efforts that the District may undertake to improve the public's understanding of lake issues by:
  - —conducting community survey of residents and landowners within the next four years.
  - —distributing at least 2 newsletters annually.
  - —encouraging community participation in lake management activities.
- Conduct in-lake management activities with the long-range goal of minimizing management to the extent possible by:
  - —conducting year-end evaluations as to the success of plant management activities and the community reaction to the activities.
  - —tracking annual progress of lake management activities.
  - —continue the volunteer monitoring program.

Chapter II

BACKGROUND

PHYSICAL DESCRIPTION

Bohners Lake is a kettle lake formed during the Lake Michigan glacier as many as 13,000 years ago. Hydrographic and morphologic data are provided in Table 1. The current lake level is maintained by a dam with a two foot head located on the outlet on the north shore. The lake has a large shoal area near the inlet on the South West end of the lake. The lake is nearly circular in shape. Gravel and sand dominates the near shore lakebed where the lowest densities of aquatic vegetation are found. Almost half of the shorelines are steeply sloped with some of the steep slopes extending into the lake.

Land use activities can directly affect the chemical and biological components of a lake, as well as plant growth patterns in a lake. To see this affect, it is helpful to look at lakes with storm drain outlets to see the more concentrated effects of rural and urban impacts. Often, the lakebed area near storm drains has different plant and sediment characteristics than other areas of the lake bottom. The runoff from individual homesites, development, and agricultural lands adds to the nutrients and sediments in a lake. That in turn increases the plant growth, sometimes to nuisance conditions. Nutrients, sediments and other materials entering the lake can severely impact the plants, fish and wildlife. Lower oxygen levels, fish kills, and sedimentation of spawning beds can result. Lake use activities, such as skiing and boating, that are conducted in areas of a lake with insufficient depths, can also result in the disruption of sediments. Education of the general public, especially the lake front property owners, should focus on activities to minimize their impact on the lake.

Table 1 Hydrography and Morphology of Bohners Lake
Racine County, Wisconsin, 2003

Area = 135 acres
Shore length = 1.9 miles
Shore development factor* = 1.16
Watershed area = 1958 acres
Maximum depth = 30 feet
Mean depth = 9.2 feet
Ratio of watershed area to lake area = 14.5:1

* Shore development factor is defined as the ratio of shoreline to the circumference of a circle with the same area as the lake.

Sources: WDNR

Civil Divisions

Bohners Lake is entirely within the Town of Burlington in Racine County. The Bohners Lake Sanitary District surrounds the Bohners Lake area and in 1995 installed a sanitary sewer system. The system replaced the septic systems around the lake, many of which were failing. Communication between the organizations is enhanced by regular communication between the groups.

Watershed

This drainage lake[1] has a direct inlet and receives water from the 1958 acres that comprise its watershed. As of 1993, the drainage area to Bohners Lake was comprised of woodlands (32%), wetlands (29%), agricultural (22%) and residential (17%)[2]. Since 1993, the residential development has continued to increase, mostly at the expense of the woodlands. Although the agricultural land area is relatively small, the RA Smith report indicated that the slopes and soils of the agricultural land contribute a large amount of runoff into the lake. A portion of agricultural land in the southern watershed area known as the “mint field” is being acquired by the Department of Transportation as part of a highway construction project around Burlington. The prior-converted wetland will be restored. This restoration will eliminate a large source of sedimentation. The steeply sloped areas of the watershed have the potential to cause serious erosion during development activities.

Soils

The predominant soils in the watershed are Casco, Fox, and Houghton muck. Muck soils are found in the inlet, outlet, and wetland areas. Silt loams are found along the east shore, and the area west of the lake. Loams and gravel loams comprise the remaining soils in the watershed. The soils on the steep slopes in the watershed are highly erosive.[3]

1. Drainage lakes have both an inlet and an outlet. Bohners Lake’s inlet enters the lake on the southern shore. The dam is located on the north shore.
2. Bohners Lake Inlet Watershed Study, RA Smith & Associates, 1993
3. Soil Survey, Kenosha and Racine Counties, Wisconsin, USDA, Soil Conservation Service

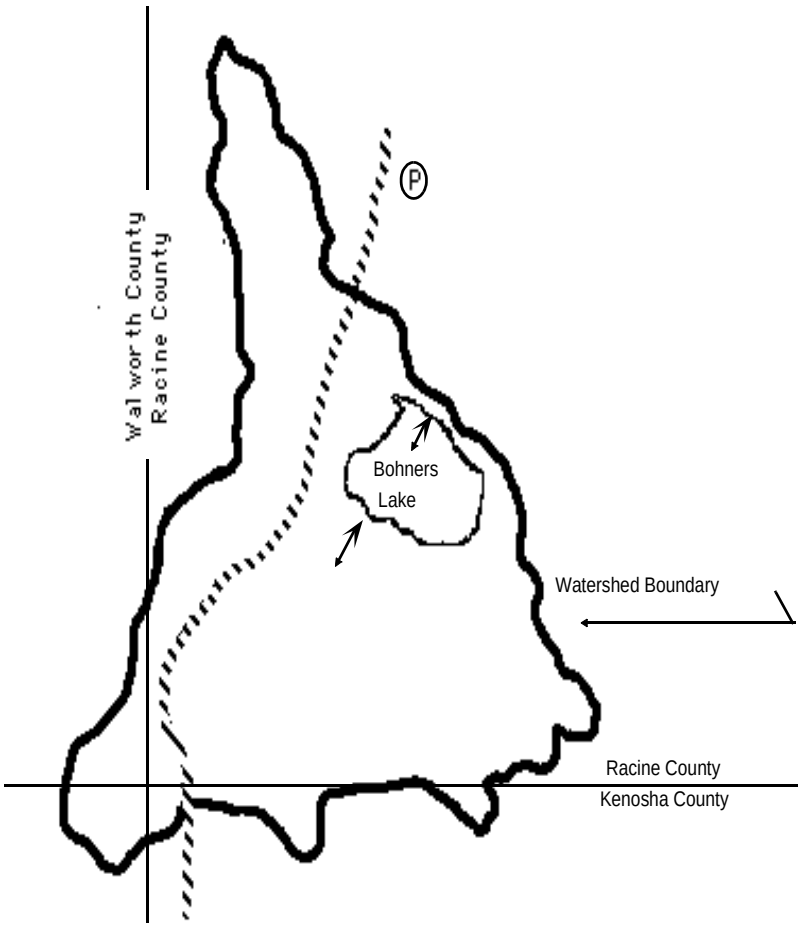


Figure 1. Direct Tributary to Bohners Lake

SHORELINE DEVELOPMENT & AESTHETIC FEATURES

Bohners Lake and its watershed are highly developed. The lake's very circular shoreline means that there are no quiet bays to provide refuge for fish, wildlife and humans seeking an area for quiet reflection. Most of the lake shoreline is developed with single-family residential, however, the varied landscape and steep slopes provide a more pleasurable aesthetic view than other comparably developed lakes. The steep shorelines can also contribute significant problems for the lake: disturbances by residents can result in serious erosion if preventive steps are not taken. The large wetland and woodland areas in the watershed provide a degree of water quality protection for the lake.

HISTORICAL CONDITIONS

There is limited, detailed historical information available on many lakes in Wisconsin. In 1969, the Wisconsin Department of Natural Resources (DNR) published the Bohners Lake, Lake Use Report No. FX-25. That report indicated that there was relatively little aquatic vegetation. The only pronounced concentration of plants was found along the shoreline near the inlet. The rest of the lake

had only scattered vegetation with muskgrass being the most dominant plant. Aquatic plants at that time rarely interfered with lake use activities. Coontail, muskgrass, duckweed (*Lemna minor*), Eurasian water milfoil, nitella and great bladderwort (*Utricularia vulgaris*) were identified in the 1969 survey.

An aquatic plant survey was conducted in 1995 and a plant management plan was developed. The survey found significant amounts of plants compared to the 1969 report. The data from the 1995 survey is included in the Aquatic Plant Chapter.

ECOLOGICALLY VALUABLE AREAS

The level of development around lakes and the amount of recreational use lakes receive often diminish the value of the resources to fish and wildlife. Often, people tend to underestimate the affect they have on the rest of their environment. But indeed, the affect can be significant. Wildlife will avoid areas frequented by boats and noisy lake users. Waves from the continuous use of watercraft can erode shorelines and drive furbearers from their nests. Neatly manicured urban lawns do not protect shorelines from the corrosive action of waves, nor do they provide wildlife with shelter or shade. Retaining walls do not provide areas for small invertebrates, an essential element in the food supply for fish. Spawning areas can be disrupted by propellers or personal watercraft. Migrating birds and waterfowl seek quiet resting places or nesting areas.

In March 1989, the State enacted legislation to protect special or 'Sensitive' lake areas from some negative impacts. The WDNR was charged to administer an aquatic nuisance control program which includes Sensitive Area Designation. Administrative Code NR 107 provides the guidance used to administer the WDNR's aquatic plant management program. The program seeks to protect native vegetation that is important to fish and wildlife. The WDNR may also restrict other activities that would prove detrimental to the native plants. These restricted activities may include dredging, filling, shoreline alterations or sand blankets.

Many plant management activities are now regulated by the state. Legislation that was recently passed requires permits for activities including chemical treatment, aquatic plant harvesting, native species re-introductions, etc.

The WDNR has not conducted a Sensitive Area designation on Bohners Lake. Map 8 shows the areas of the lake that have the greatest aquatic plant diversity, one important component in the Sensitive Area program. However, because these areas also contain the greatest densities of exotic species, they may not be considered sensitive. The native species in these areas are extremely important to the long term health of the fisheries and vegetation diversity on Bohners Lake and should be protected.

Bohners Lake has very limited areas of natural shoreline. Residents should be encouraged to naturalize their shorelines. Aquatic vegetation in the nearshore areas stabilize soft sediments, preventing them from becoming resuspended into the water column because of wind or boating. The shallow areas of native aquatic plants should be preserved.

FISH AND WILDLIFE

Bohners Lake maintains a warm water fishery. Northern pike and panfish are plentiful. Large-mouth bass are abundant in the lake. The WDNR has occasionally stocked northern pike. A recent electrofishing survey produced 75 largemouth bass between 5 and 17.4 inches. Bluegills were the most abundant panfish found. Other species found were grass pickeral, pumpkinseed, black crap-pie, yellow perch, warmouth, northern pike, and carp[1]. Detailed survey of the fisheries are valuable tools for assessing the health of the Bohners Lake fishery. The District should continue to work with WDNR fisheries to ensure regular surveys take place to protect the quality of the fisheries.

The high level of residential development restricts the value of the resource to wildlife. The lake may be used by ducks, geese and other waterfowl primarily during migration. Shorelines that are highly developed, especially those with retaining walls, create problems and barriers for frogs and turtles that need access to land. Retaining walls have few, if any, spaces and cavities for small creatures to hide. This can impact the food source for fish.

A problem facing many lakes in Southeast Wisconsin is the non-migratory Canada goose. These geese are an entirely different species than the migratory goose and cause significant problems. The non-migratory geese remain in an area year-round. They especially like mowed lawns and open water, making lakeshore areas prime targets. People often enjoy watching a few of these geese, but the problems arise as the numbers increase. Problems include overgrazing lawns, droppings on lawns and beaches, and polluting water. Bohners Lake area has been trying to resolve their goose problem. The community has regular beach closings in spite of daily beach cleanup activities. The District is working with the USDA on a goose removal project to bring the numbers of geese down to an acceptable level.

WATER QUALITY

Water quality studies on Bohners Lake have been limited to Volunteer Self Help Monitoring, under guidance from the WDNR. Volunteers have collected data since 1989. According to the 2002 Annual Report[2], the lake is considered mesotrophic, with an average Trophic State Index of 28. Mesotrophic lakes are moderately fertile systems that support abundant aquatic plant growth and productive fisheries. The average Chlorophyll was 7 ug/l, ranging from a low of 1 ug/l on May 31, 2002 to a high of 19 ug/l on April 27, 1993. Total Phosphorus averaged 26 ug/l, with a low of 4 ug/l on April 2, 1995 to a high of 260 ug/l on July 21, 1993. Clarity of the lake is measured by use of a secchi disk, and readings ranged from a low of 4.75 feet on July 18, 1991 to a high of 17.5 feet on May 13, 1996. The highest clarity readings are typically found in May, with the lowest being found in July.

The Self-Help data may be accessed on the WDNR website by going to: www.dnr.state.wi.us/LakesSelfHelp/lakeshome.asp. Then select ”Annual Report” or “Download Chemistry and Secchi Data”. Then enter “BOHNER” and Racine County. The lake entry is case

1. Pers. Correspondence, D. Welch, WDNR
2. 2002 Self-Help Lake Monitoring Results For Bohner Lake (Racine County) Deep Hole, Wisconsin Department of Natural Resources

sensitive so be sure to enter BOHNER, or you may not reach the proper site. The 2002 annual report is included in the Appendix.

EXOTIC SPECIES

During the aquatic plant survey, Bohners Lake was evaluated for exotic species. Eurasian water-milfoil and curly-leaf pondweed are exotic plant species present in Bohners Lake. Purple loosestrife is a wetland exotic species present in the surrounding area. No zebra mussels have been found in Bohners Lake to date. Educational programs should focus on the preventative actions that can be taken by lake users to prevent the introduction of invasive, exotic species. This can include newsletter articles, and boat launch signage that explains how exotics are transferred from lake to lake and what actions can be undertaken by individuals to prevent infestation.

LAKE USE

Bohners Lake receives a high degree of recreational pressure. The majority of recreational uses are water-skiing, personal watercrafting, scenic viewing, swimming and fishing. There are three beaches on the lake: one owned by the Town, and two private Association beaches. Swimming conditions are affected by nuisance quantities of aquatic plants, which are chemically treated annually. Swimming is also limited by water quality problems, usually in mid-August when high coliform readings close the beach. The numbers of high coliform readings have been reduced since the District began a daily beach-cleanup program to remove goose droppings.

The small size of the lake restricts the area available for high speed boating activities. Nuisance aquatic plant problems further restricts the area available for boating activities. Another factor influencing lake use in 2002 and 2003 is the water level. Serious drought conditions have prevented the lake from maintaining its normal level. As of October 2003, the lake was down below the level influenced by the dam. This makes access for riparian landowners difficult, if not impossible.

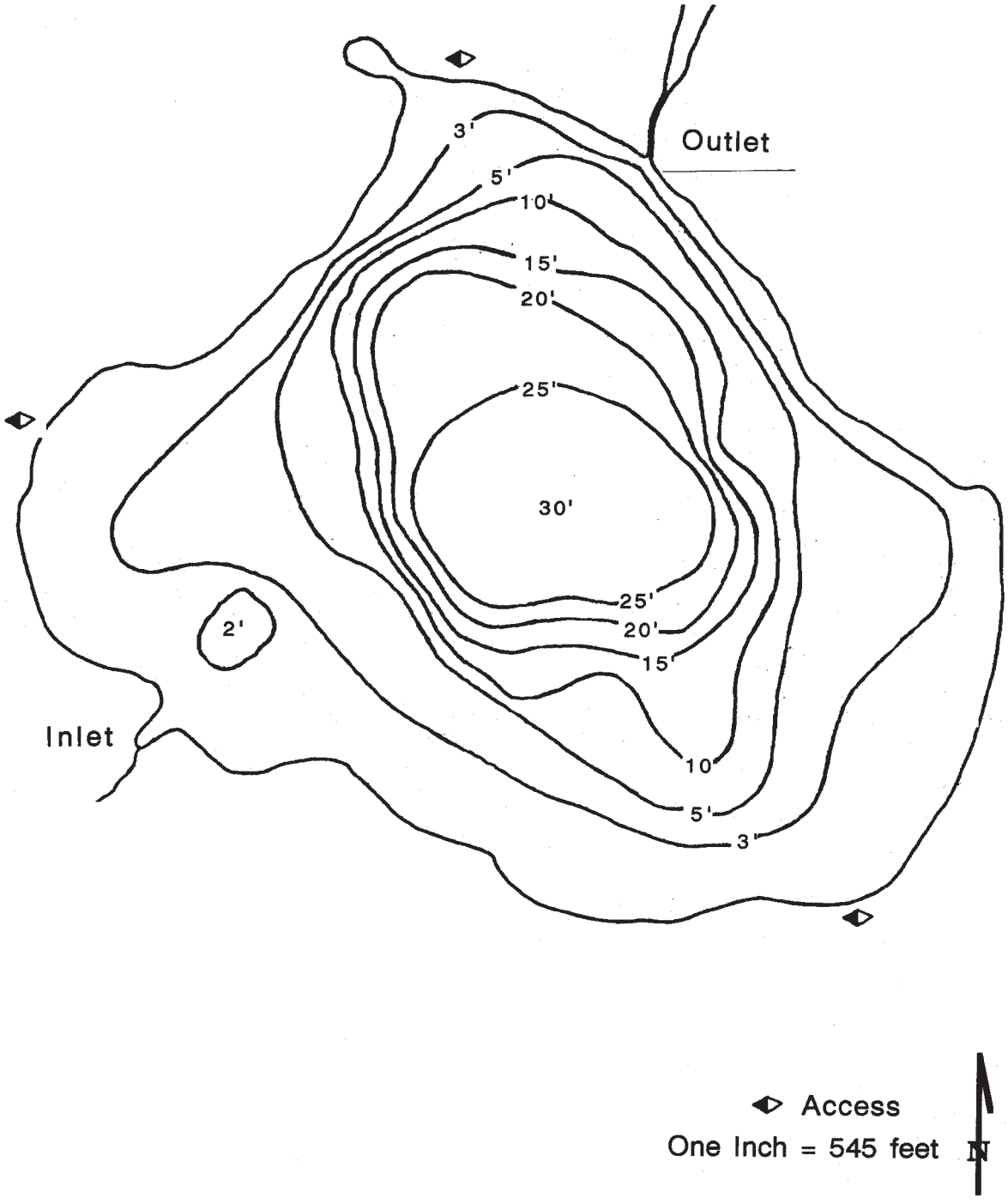
ACCESS LOCATIONS

Bohners Lake meets the WDNR standards for public access to an inland lake. The primary boat access to the lake is provided at a Town launch located on the northwest shore (Map 1). A public beach is located next to the launch. There are also two subdivision beaches, one on the West shore and one on the Southeast shore. The Southeast beach also has a private boat launch.

BOATING ORDINANCE

The Town of Burlington has a boating ordinance in effect on Bohners Lake. The local ordinances are occasionally reviewed and modified. A copy of the ordinance is included in the Appendix. In addition to the local ordinances, state laws are in effect on the lake and are enforced by the Conservation Wardens. The Town operates a boat patrol on Bohners Lake and installs and maintains the buoys.

Map 1 - Bohners Lake



Chapter III

AQUATIC PLANTS

BACKGROUND

Aquatic plants are very important to the health of a lake. They provide food and cover for fish and wildlife as well as contributing to dissolved oxygen production. Invertebrates, upon which fish and wildlife depend for food, spend much of their life cycle on or near plants. Young fish and wildlife use plants for shelter and protection from predators. Plants also bind sediments, helping control shoreline erosion and turbidity. Without plants, nutrients in the water column are readily available to fuel algae blooms. Native plant beds rarely experience oxygen or pH problems that are often associated with exotic species. Plants also stabilize sediments, helping control shoreline erosion, and turbidity. An aquatic plant monitoring program may provide an early warning signal that the lake is reacting to negative impacts from the watershed or recreational use activities.

Many aquatic plants are important food sources for waterfowl. Others provide habitat, spawning and shelter areas for fish and amphibians. Exotic plants species do not provide these benefits as well as the native plant species. Exotic plant species tend to grow more densely, and often grow to the surface where they interfere with recreational uses. Some exotic plant species will create "canopies" that prevent light from reaching native plants underneath, raising water temperatures, and stressing the plants. Protection of native species is an important means of reducing problems from exotic species. Just as crabgrass and dandelions are the first plant to invade a disturbed area of a backyard, Eurasian watermilfoil is one of the first to invade disturbed sediments in a lake.

Types of Aquatic Plants

There are four types of aquatic plants: emergents, floating-leaved, submergents, and freely-floating. Emergent plants are rooted in the lakebed with the tops of the plant extending out of the water. The sediments are either submersed or partially inundated with water. Common emergent species include bulrushes, cattails, and reeds. Floating-leaved plants are rooted in the lakebed and the leaves float on the waters surface. Floating-leaved plants usually have larger rhizomes. The most common of these plants are waterlilies. Floating-leaved plants are usually found in quieter, protected areas of a lake. Submergent plants grow completely submersed under the water, although flowering or seed portions may extend out of the water. These plants include pondweeds, Eurasian watermilfoil, muskgrass, and others. Submersed plants are affected by the amount of light that can penetrate the water. Freely-floating plant species are entirely dependent on the water movement in a lake. These plants include coontail and duckweed. Freely-floating plants are found where ever the winds and water current take them.

Littoral Zone

The term littoral zone is commonly used to describe the area of the lake from the shore out to the depth where plants no longer grow. This area receives sufficient light to grow vegetation, with coarse sediments and fluctuating water temperatures.

Plants within the littoral zone are affected by a number of factors. Steeply sloping lake bed areas do not support the vegetation that flatter areas support. Soft sediments usually support more plants than hard sand or gravel areas. Exotic plants tend to favor soft sediments. Wind and wave action impacts plant growth.

Even the shape of the shoreline impacts plant growth. Interior bay areas of the shoreline collect sediments and debris, creating soft sediments that support abundant amounts of vegetation; while jutting shoreline areas tend to erode, sending their sediments into bays and depressional areas.

PLANT DESCRIPTIONS

Pondweeds

Pondweeds are important species of plants for a lake. Pondweeds do not grow as quickly or as dense. They do not create a dense canopy like exotic species such as Eurasian watermilfoil. Pondweeds support food and provide cover for fish. Most pondweeds provide good to excellent food for waterfowl. Different species of pondweeds become important at different times of the year. Exotic plant species do not provide these benefits as well as the native plant species. Exotic plant species tend to be more dense, and often grow to the surface where they interfere with recreational uses. Some exotic plant species will create 'canopies' that prevent light from reaching native plants underneath. These canopies also raise the temperature of the water beneath the canopies. Pondweeds support much greater populations of macroinvertebrates than exotic plant species such as Eurasian watermilfoil. Plant management on lakes should focus on protection and enhancement of the pondweeds, while controlling nuisance species.

The Wisconsin Legislature sought to protect native pondweeds in 1989 with the passage of NR107. That legislation names 12 aquatic plant species that should be protected and enhanced. The protected plants that are found in Bohners Lake are *Stuckenia pectinata* and *Vallisneria americana*. Other high value species in Bohners lake include *Potamogeton foliosus* and *Potamogeton gramineus*.

Curly-leaf Pondweed (*Potamogeton crispus*)

Curly-leaf pondweed is an exotic plant species. It gains an advantage over native plants by becoming established very early in the season. Curly-leaf pondweed tends to be more dominant in early summer, dying off in mid-July and August. Curly-leaf pondweed produces dormant structures called turions by the end of June and early July. The turions rest on the bottom until fall, when they begin to germinate and produce small plants. The fall growth over-winters in a green condition (Nichols and Shaw, 1990). In spring, when water temperatures and light intensities increase, Curly-leaf is ready to grow, out-competing other plants that must germinate from seeds or re-establish rootstocks. Curly-leaf reaches the peak of its life-cycle in June and July. Then it dies back in mid-July when other plants are beginning their peak growth periods. If curly-leaf pondweed dominates the plant community in a lake, the die-off can create algae blooms when the decaying plants release the nutrients. Curly-leaf pondweed provides a good food source for waterfowl, especially as an invertebrate substrate, which is also used by fish. Curly-leaf pondweed may provide good cover for fish as long as densities do not reach nuisance levels.

Curly-leaf pondweed is present in Bohners Lake and is increasing its range. The most effective means of control of curly-leaf pondweed is to protect the native plants and secondly, to prevent turion production. This means conducting plant management activities prior to the formation of the turions. Exercise caution when determining which plant management technique should be used because native pondweeds may be impacted.

Curly-leaf pondweeds are abundant in Bohners Lake. It is a problem around the shoal area of the lake where is grows prolifically.

Eurasian Watermilfoil (*Myriophyllum spicatum*)

Eurasian watermilfoil is an exotic plant that quickly takes advantage of opportunities for growth. In many lakes it can become a severe nuisance, creating dense plants with large canopies on the surface that shade out other more desirable plant species. Fishing and boating is impaired or restricted and swimming becomes dangerous in the long, stringy plants. Eurasian watermilfoil can contribute to stunted panfish populations by providing too much protection from predator fish (WND, 1988). Eurasian watermilfoil stands have been found to support fewer macro invertebrates than comparable stands of pondweeds and wild celery (Smith and Barko, 1990). This in turn affects the fisheries that can be supported by the plants. Eurasian watermilfoil has been thought to spread primarily by fragmentation, however, there is now evidence that seeds play a much more important role than previously believed (Aron, 2002).

Eurasian watermilfoil is a dominant plant in Bohners Lake. Because it is unknown how long the plant has been in Bohners Lake, total removal is unlikely. However, management activities should focus on protection of native plants, and management of Eurasian watermilfoil to minimize the spread of the plant. Non-management of Eurasian watermilfoil on other lakes in Wisconsin has led to increased competition over native plants, and a decline in the density and frequency of native plants.

Eurasian watermilfoil is a problem on Bohners Lake. The plant grows primarily in the deeper zones, and is a significant problem around the shoal.

Muskgrass

Muskgrass (*Chara* sp.) is actually an algae, but is usually included in discussions of aquatic plant management. Muskgrass is low growing and can help prevent or reduce the growth of Eurasian watermilfoil. It can also protect lake sediments from the effects of boaters. Muskgrass will not thrive in lakes with high turbidity problems. Muskgrass is an excellent producer of fish food for large and small mouth bass (Fassett 1985).

Muskgrass is a very important asset for Bohners Lake and should for the most part, be protected to help reduce infestations of other potential nuisances such as Eurasian watermilfoil. However, in some lakes, muskgrass can become very dense and problematic, prompting management actions to improve recreational access to waterways.

Muskgrass has occasionally created problems on Bohners Lake. Areas with the greatest problem are on the West and South shores where muskgrass limits boating access. It also collects algae and debris, causing odor problems for residents.

Widgeon Grass

Widgeon grass (Ruppia maritima) is a non-native aquatic plant that is rarely found in Wisconsin. Locally, it is found in Browns Lake in Racine County and in the Twin Lakes, Elizabeth and Mary Lakes, in Kenosha County. In those lakes, widgeon grass is most commonly found in deep water. Like other non-native plants, it can grow to very dense, nuisance conditions. Browns Lake controls the plant with harvesting. In the Twin Lakes, it grows primarily in deep water (8 to 12 feet), rarely reaches the surface and is not being actively managed. Plant fragments can be significant, creating problems for shoreline maintenance. Unlike most exotics, widgeon grass is beneficial. The seeds, tubers and foliage are excellent waterfowl food. Seeds provide food for birds. The plant provides food and cover for fish. Although it is usually found in deeper waters, in Bohners Lake dense populations are found in shallow water on the west side of the lake, where it interferes with lake use.

BOHNERS LAKE AQUATIC PLANTS

An aquatic plant survey was conducted by Aron & Associates (A&A) in June of 2003. The field work was conducted in accordance with DNR approved methods for aquatic plant surveys. Twenty transects that were established in the 1995 survey were used for the 2003, to allow comparison of data. Four depths were sampled along the transects at the 2, 4, 7, and 10 foot depths. Map 3 shows where the transects were surveyed. To ensure that all plant communities were documented, a general survey was conducted on the rest of the lake, following a zigzag pattern across the littoral zone of the lake.

Map 2 shows the area of Bohners Lake that was able to support aquatic plants in 2003. The 2003 survey data is included in the Appendix. Maximum rooting depth in 2003 was found to be fifteen feet, up from 12 feet in 1995.

During the 2003 survey, a total of 19 species was observed (Table 2). In general, Bohners Lake has a good diversity of aquatic plants. Of the 19, three species, Eurasian water milfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*), and widgeon grass (*Ruppia maritima*) are exotic (non-native) species. Exotic plant species in general provide less benefits to the resource than do native plants.

The greatest diversity of aquatic plants was found at the 7 foot sampling depth where a total of twelve plant species were found. Muskgrass (*Chara* sp.) was the dominant species in the two and four foot depths. Widgeon grass (*Ruppia maritima*) and sago pondweed (*Stuckenia pectinata*) were dominant at the seven foot depth. Widgeon grass (*Ruppia maritima*) and Eurasian watermilfoil (*Myriophyllum spicatum*) were dominant at the ten foot depth. Five species were found at all sample depths: Eurasian water milfoil (*Myriophyllum spicatum*), muskgrass, curly-leaf pondweed (*Potamogeton crispus*), sago pondweed (*Stuckenia pectinata*) and widgeon grass.

The “milfoil weevil” was not found in Bohners Lake during the plant survey or subsequent lake inspections.

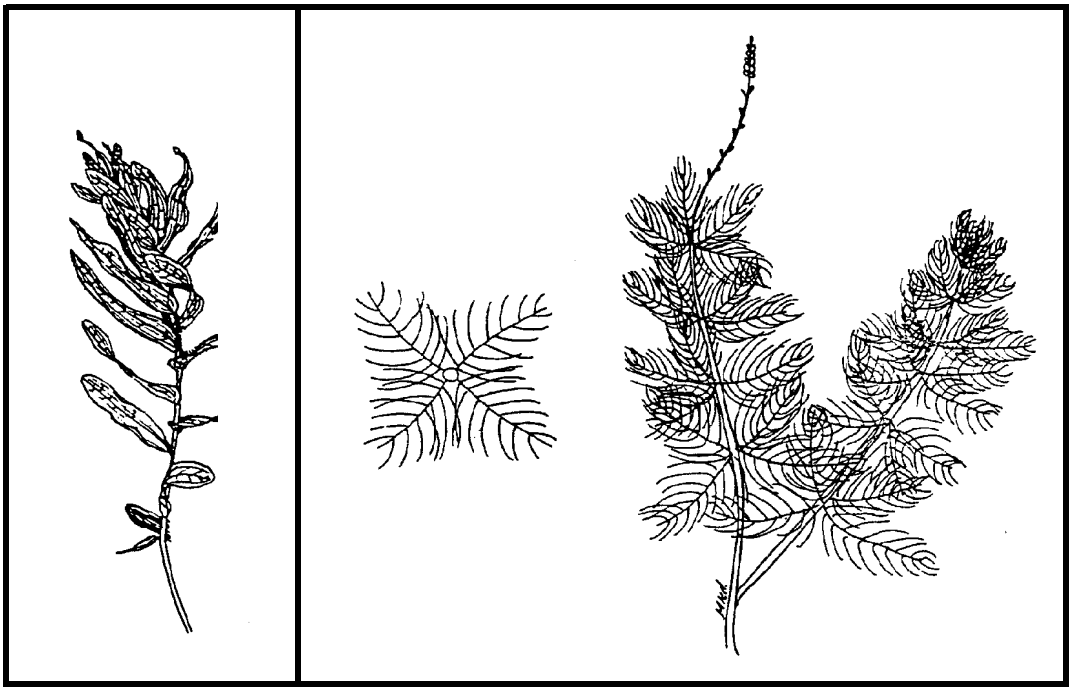


Figure 1. Curly-leaf Pondweed and Eurasian Watermilfoil.

Discussion

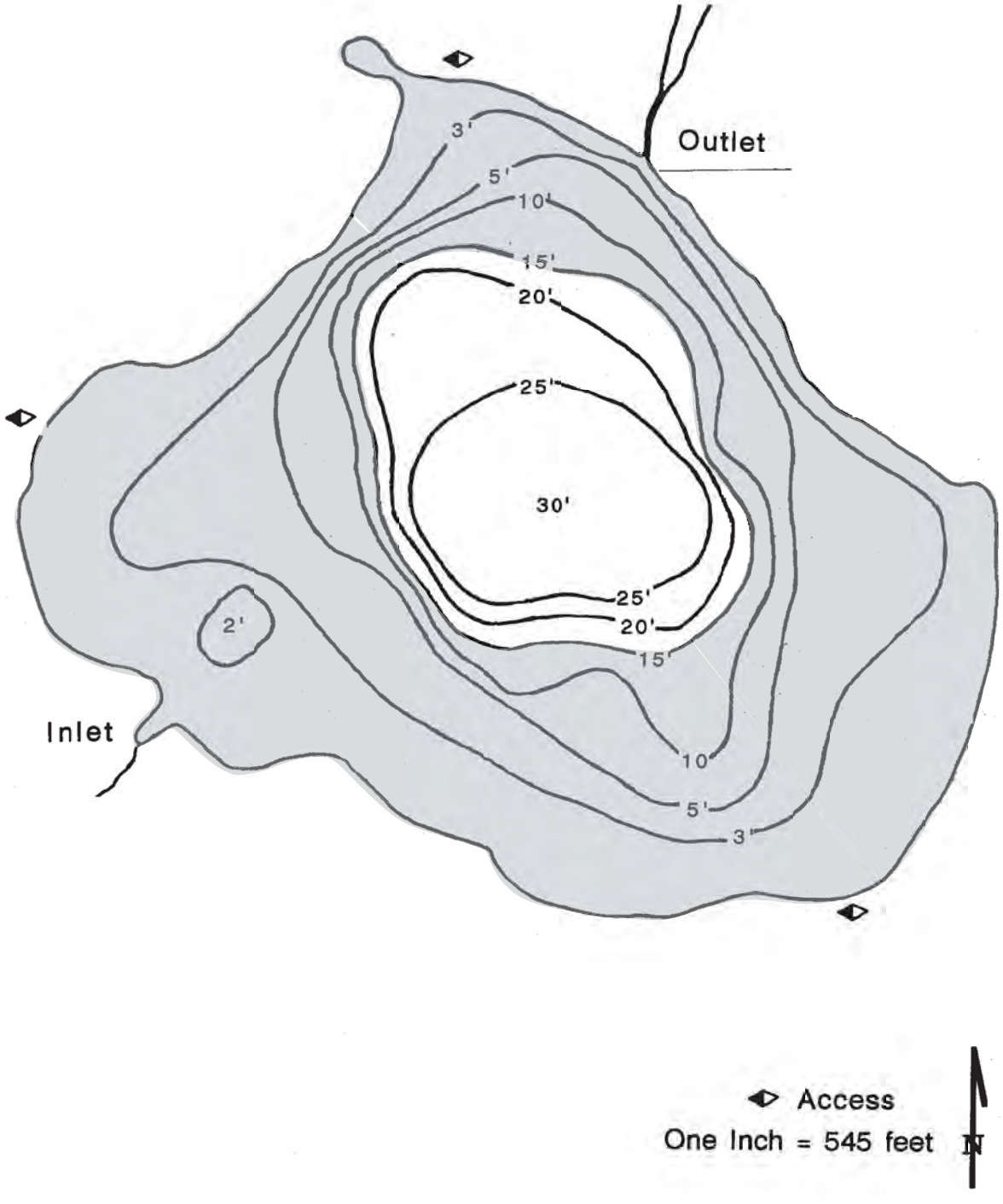
A number of changes have occurred in the aquatic plant community in Bohners Lake since the 1995 survey was conducted:

- The area available for aquatic plant growth has increased from 12 feet in 1995 to 15 feet in 2003. This allows plants to grow in areas that were previously unavailable.
- Eurasian watermilfoil expanded its range significantly. The District has conducted regular chemical treatment for the control of Eurasian watermilfoil in the near-shore areas. Those treatments are conducted once in early June and have proven very effective. Harvesting began in the late 1990s because Eurasian watermilfoil had increased and was inhibiting boating.
- Widgeon grass declined.
- Muskgrass survey data also showed a decline, however, that is largely due to the chemical treatment that was conducted in 2002. In 2002, muskgrass was a significant nuisance that covered much of the West and South shorelines. Attempts to remove the muskgrass using hand controls and mechanical harvesting were unsuccessful. The material was too dense

for the average landowner to handle, and the shallow conditions caused damage to the mechanical harvester and the lake bottom. The muskgrass was treated with Cutrine Plus, which had little, if any, affect. The muskgrass was then treated with Hydrothol which knocked back the nuisance conditions. The results lasted into 2003. Although there were initial concerns that the treatment was too effective, muskgrass was rebounding significantly by the end of the summer of 2003.

- Filamentous algae was a problem in the late 1990s and early 2000s. Dense stands of filamentous algae would cover acres of the lake, especially in the western shore and the shoal area. The algae would hang on the dense stands of Eurasian watermilfoil and curly-leaf pondweed. It would collect debris, it would raise the water temperature underneath the algae, and would cause odor problems. Delaying treatment resulted in multiple treatments that were less than effective. Early, aggressive treatment has been very efficient in controlling the problem quickly with much less chemical used.
- Variable-leaf pondweed has increased significantly since 1995. The increase has occurred primarily along the three to four foot depth contour. In some areas of the lake, the plants are very dense and hinder boating access.
- Beaches have been treated with contact herbicides annually for vegetation within the swimming areas. The treatments usually result in single season control. Each season, the vegetation returns, with the same diversity as the previous year prior to the treatments.
- Widgeon grass stands are dense, and the long, stringy plants are easily pulled out by boaters. When disturbed, widgeon grass creates large quantities of floating plant debris. The harvesting conducted the past few years has attempted to control the problem with floaters by harvesting the tops of the plants to minimize their disturbance.

Map 2 Area Available for Aquatic Plant Growth on Bohners Lake - 2003



Aron & Associates, 2003

Table 2 List of Plant Species in Bohners Lake, 2003

Scientific Name	Common Name
Ceratophyllum demersum	Coontail
Chara sp.	Muskgrass
Elodea canadensis	Elodea
Heteranthera dubia	Water stargrass
*Lemna minor**	Small duckweed
Myriophyllum spicatum	Eurasian water milfoil
Najas flexilis	Slender Naiad
N. marina	Spiny Naiad
Nitella sp.	Nitella
Nuphar sp	Yellow Water Lily
Nymphaea sp.*	White Water Lily
Potamogeton crispus	Curly-leaf Pondweed
*P. foliosus**	Leafy Pondweed
P. gramineus	Variable-leaf Pondweed
Ruppia maritima	Widgeon Grass
Stuckenia pectinata	Sago Pondweed
Utricularia vulgaris	Great Bladderwort
Vallisneria americana	Water Celery, Eel Grass

* Found in general survey only

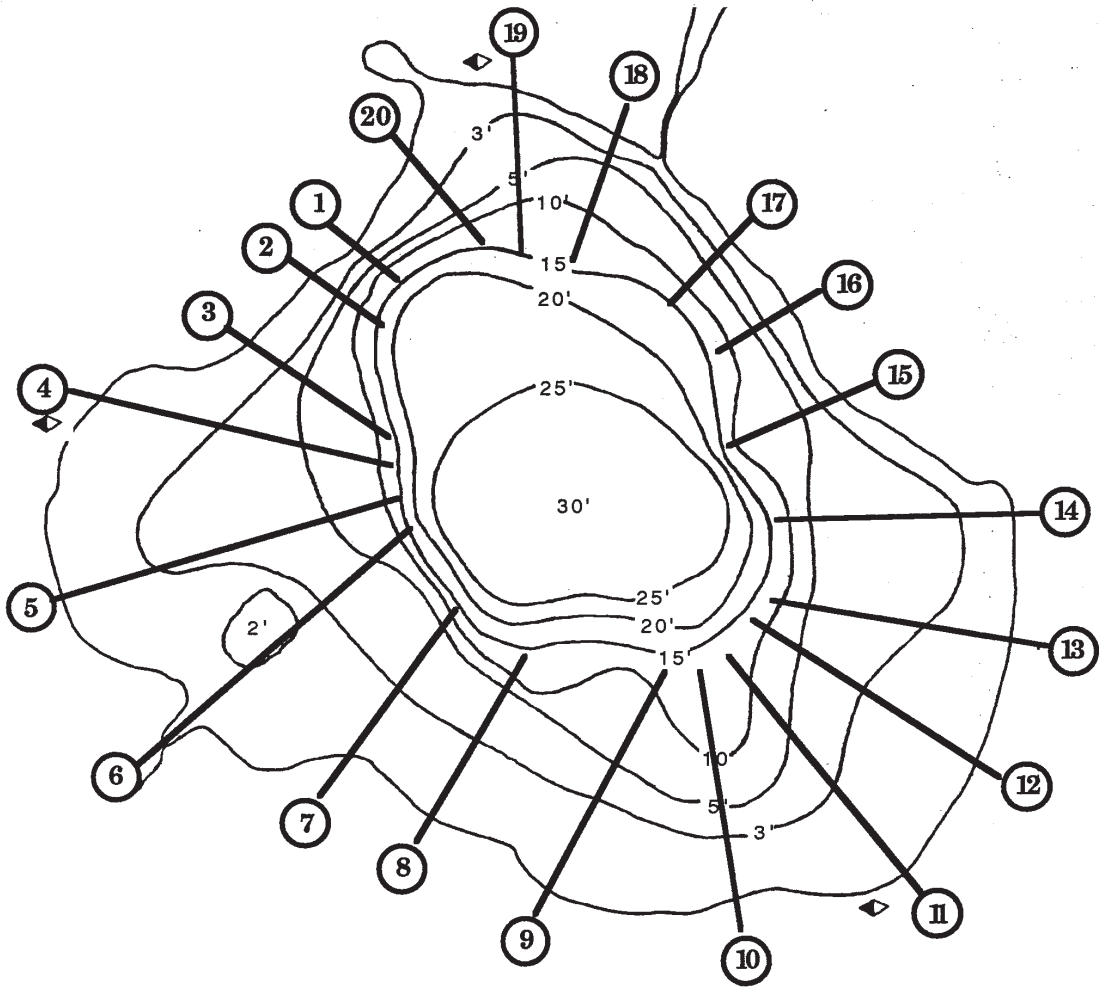
Source: Aron & Associates

Table 3. Species Distribution Comparison by Water Depth - 1995 and 2003

Species	2. 0 feet		4.0 feet		7.0 feet		10.0 feet	
	1995	2003	1995	2003	1995	2003	1995	2003
Ceratophyllum demersum	X	X	X			X	X	X
Chara sp.	X	X	X	X	X	X	X	X
Elodea canadensis	X	X		X		X		
Heteranthera dubia			X	X		X	X	X
Lemna minor	X							
Myriophyllum spicatum	X	X	X	X	X	X	X	X
Najas flexilis	X			X			X	
N. marina			X			X	X	X
Nitella sp.			X		X	X	X	X
Potamogeton crispus	X	X	X	X	X	X	X	X
Nuphar sp.		X						
P. gramineus	X	X	X	X		X		
Ruppia maritima		X	X	X	X	X	X	X
Stuckenia pectinata	X	X	X	X	X	X	X	X
Utricularia vulgaris	X	X			X		X	X
Vallisneria americana	X	X	X	X	X	X		

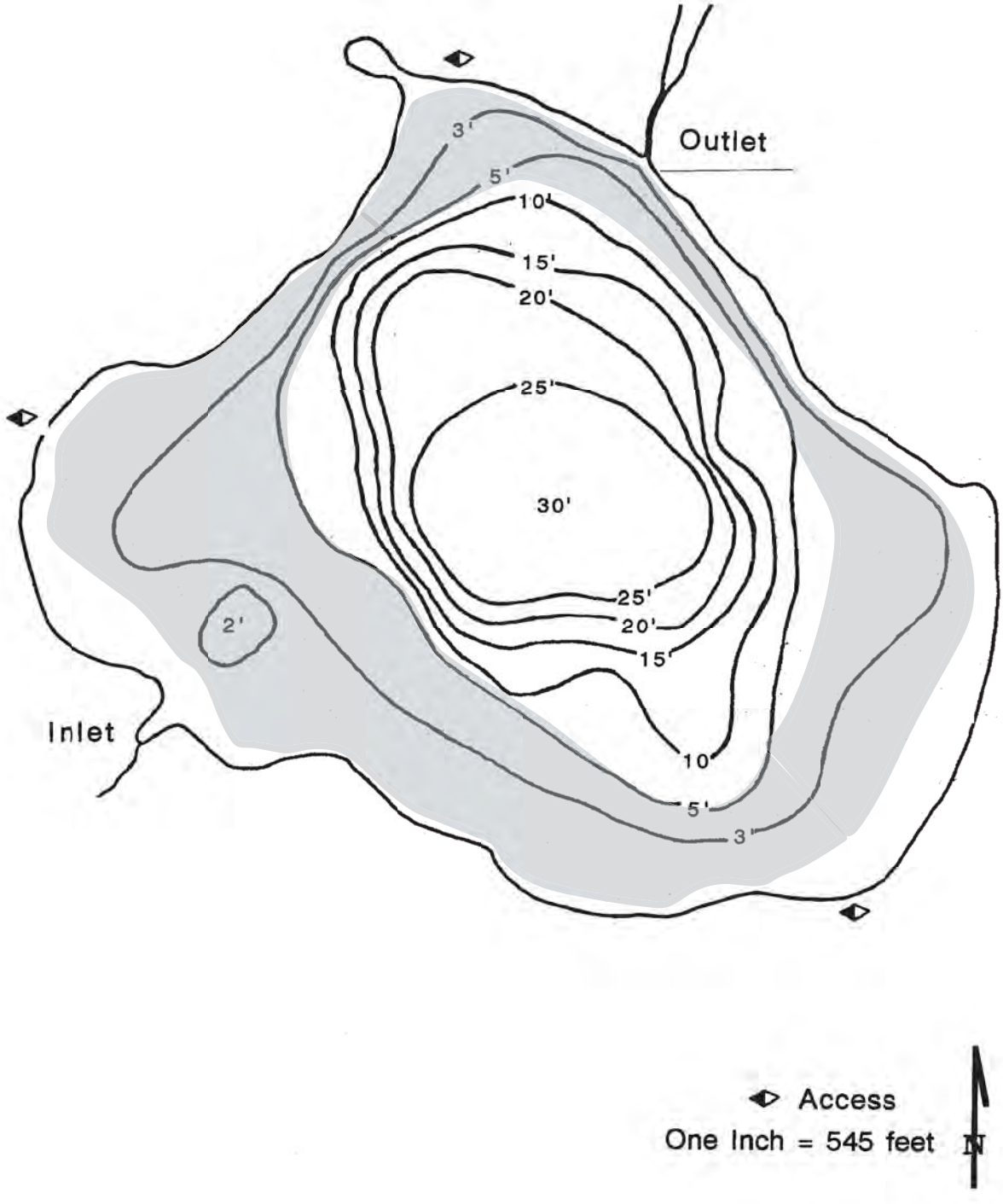
Source: Aron & Associates

Map 3 - Transect Locations on Bohners Lake - 2003



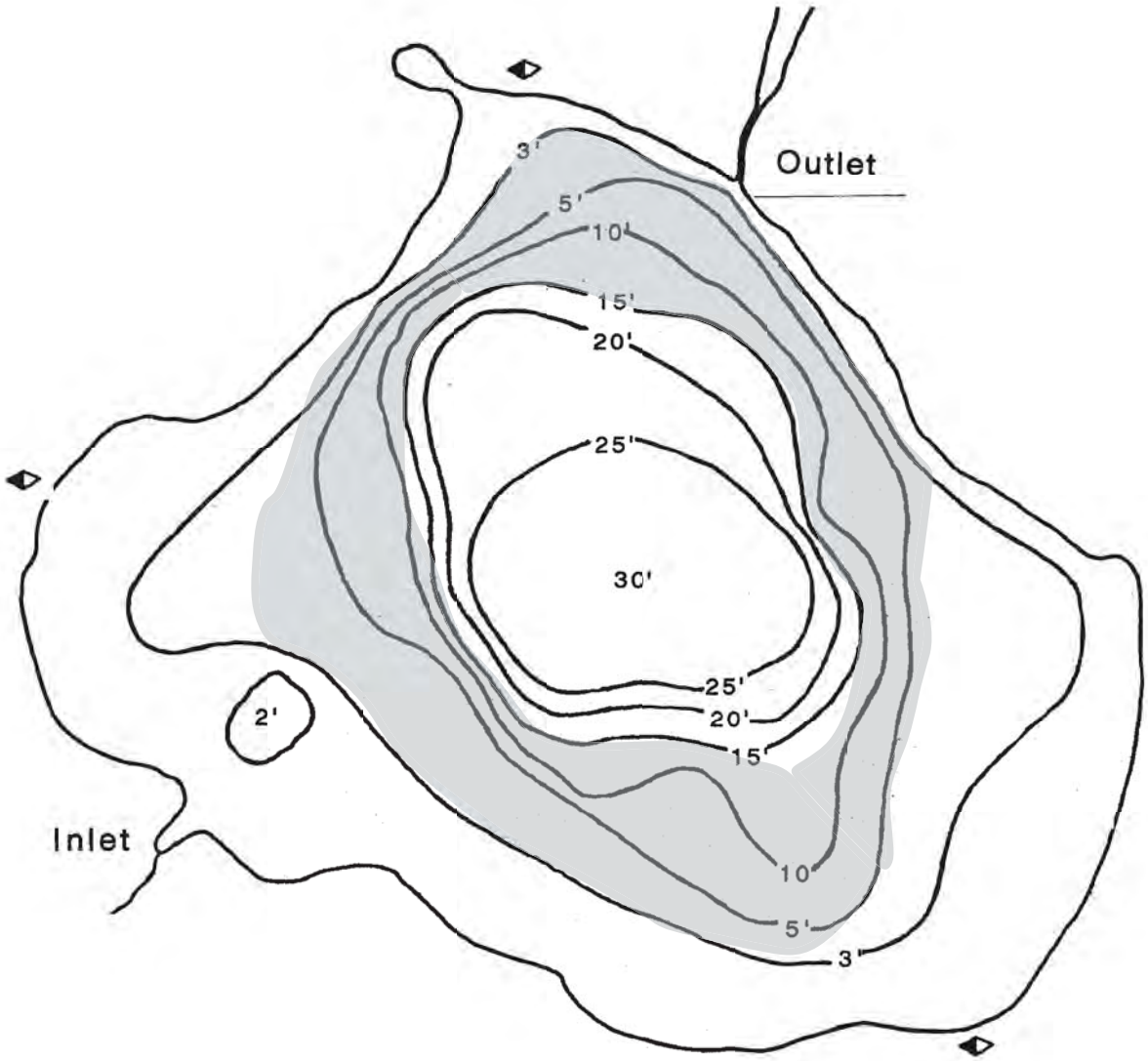
Aron & Associates, 2003

Map 4 - Areas with Abundant Muskgrass on Bohners Lake - 2003

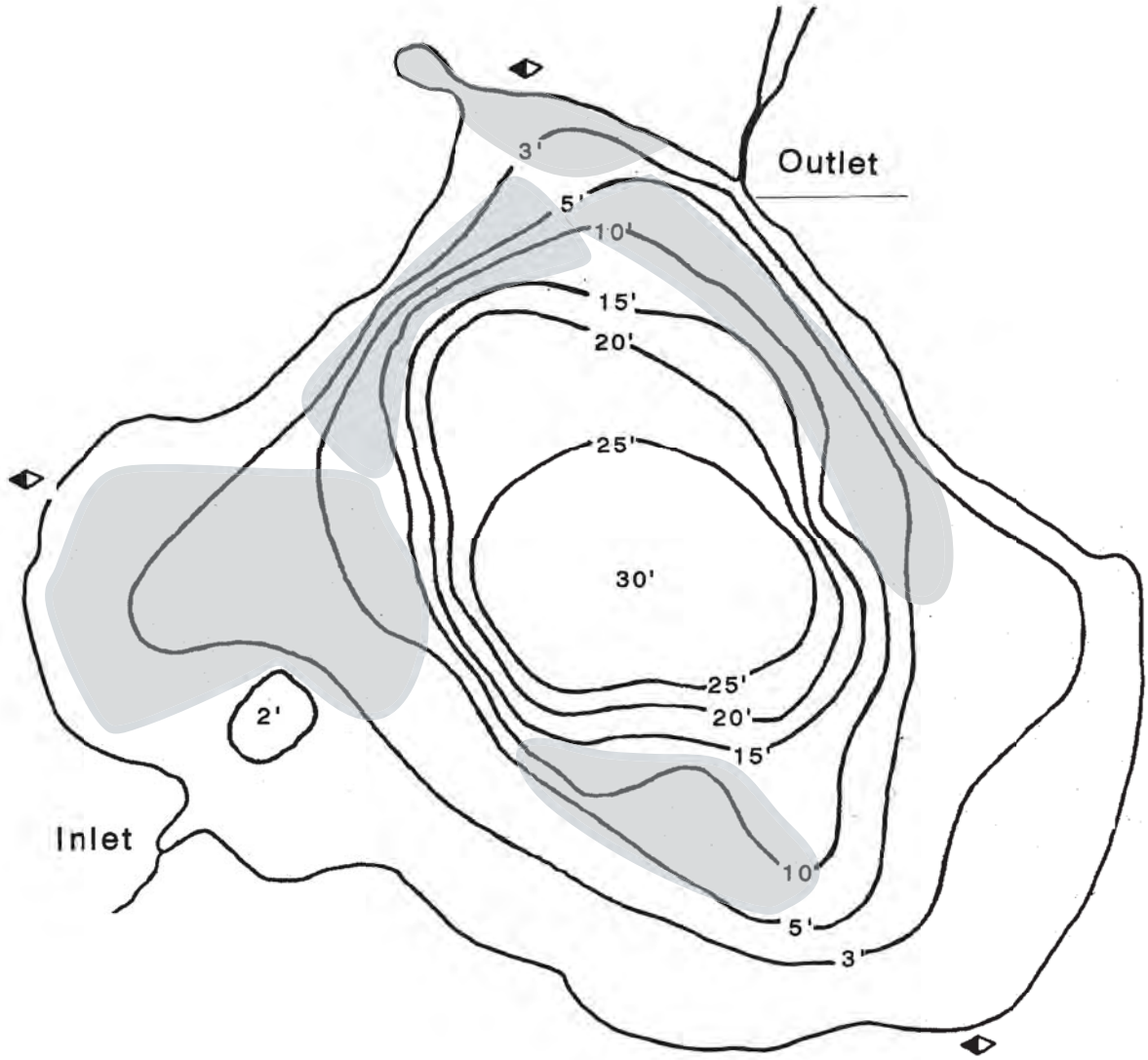


Aron & Associates, 2003

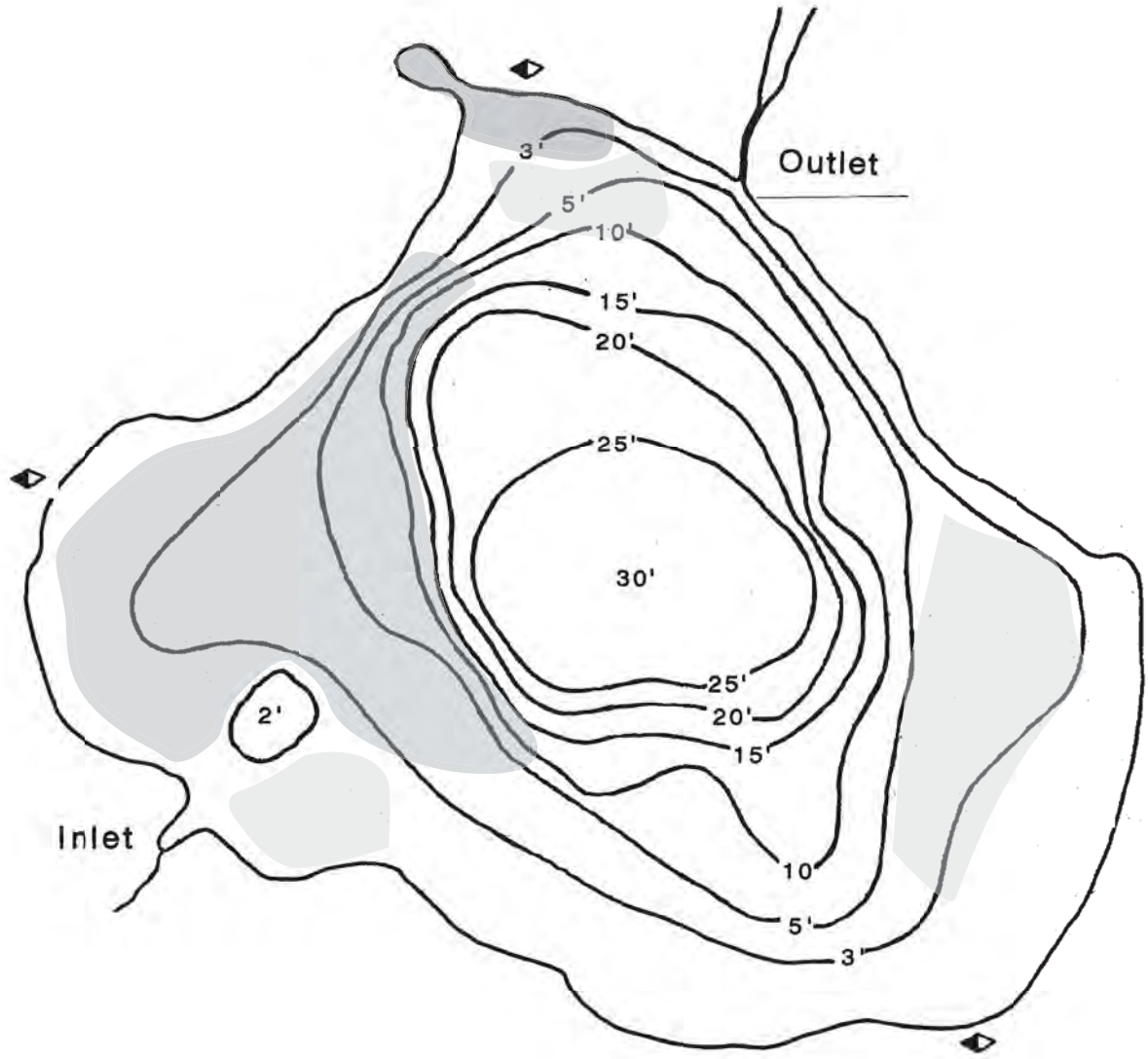
Map 5 - Areas with Abundant Widgeon Grass on Bohners Lake - 2003



Map 7 - Areas with Abundant Milfoil on Bohners Lake - 2003



Map 8 - Areas with Curly-leaf, Naiads, and Water Celery on Bohners Lake - 2003



Curly-leaf Pondweed
Naiads
Water Celery

Access

One Inch = 545 feet

N

Aron & Associates, 2003

Chapter IV

PROBLEMS

Bohners Lake is considered a quality water resource even though its waters and sediments contain sufficient amounts of nutrients to promote aquatic plant and algae growth. Phosphorus and nitrogen have been determined to be the most critical components that drive aquatic plant growth. Phosphorus is likely the limiting nutrient in Bohners Lake.

The good water clarity contributes to plants thriving in depths of 13 feet. The fertile soils in the region contribute to the excessive plant problems in Bohners Lake. Carp also create problems in lakes, disrupting game fish spawning areas, suspending sediments, reducing water clarity, and negatively impact the aquatic plant conditions.

Although the Bohners Lake area is now sewered, for many years it was not, creating an additional contribution of nutrients which may have come from improperly maintained or malfunctioning individual septic systems. This is common in densely populated, older lake communities with septic systems.

Recent publications also point to the role of various lake-side living activities as a significant source of nutrients. Maintenance of golf course-type lawns, with high doses of fertilizers and pesticides are a big contributor of nutrients to lakes. A recent USGS publication cites a study conducted on Lauderdale Lakes in Walworth County. In that study, the quality of runoff from the use of no-phosphorus fertilized areas was nearly identical to that from non-fertilized areas. However, nitrogen also plays an important role in plant growth and should also be avoided. Other human activities that negatively impact water quality include the excess use of salt in winter, pet waste, and discharges from automobiles.

When nuisance conditions exist, dense plant beds can limit boating. Dense plant beds may also impair swimming and contribute to stunted panfish populations by reducing opportunities for grazing by predators. Also, the canopies created by Eurasian watermilfoil collect debris and are unsightly and sometimes odiferous, for those desiring a pleasing scenic view. Parts of plants broken by wind and wave action, or by motors (even electric ones), float around the lake, create shoreline debris, and reroot into new areas. Also, swimming perils exist in long Eurasian watermilfoil and curly-leaf pondweed strands.

Eurasian watermilfoil, curly-leaf pondweed, muskgrass, filamentous algae, and widgeon grass are causing the aquatic plant nuisance problems in Bohners Lake.

Sedimentation from the watershed has also been a problem for the inlet and the lake. The inlet south of the lake has been dredged twice in recent years when sediment filled the small retention area south of the lake inlet. The inlet area of the lake was also dredged to remove the eroded sediments.

The District has been attempting to improve the quality of the watershed runoff. The southern watershed area through the inlet has been of primary concern. A farm field known as the “mint field” is being purchased by the Wisconsin Department of Transportation as part of a highway expansion project. This land is prior-converted wetland that will be restored. Local efforts have increased to limit the amount of sedimentation that enters Bohners Lake.

It is important to remember that it is far cheaper to prevent a problem than it is to correct a problem. A cars’ oil change costs only $20 but a new engine costs over $1000. The same holds true for lakes. Public information efforts to prevent problems and the cost of annual monitoring programs are much cheaper than major lake restoration projects. Stopping erosion and nutrients from entering the lake is much more cost effective than attempting to dredge or correct plant and algae problems.

Chapter V

HISTORICAL PLANT MANAGEMENT

CHEMICAL TREATMENT

Chemical treatment has been used by residents to control plants and algae, see Table 4. Early season chemical treatment of both plants and algae has produced better results, while using less chemical.

HARVESTING

Bohners Lake has harvested aquatic plants by using a contract harvester. For the past 4 years the District has hired an independent contractor for 1 to 2 weeks of the summer to harvest the nuisance vegetation and open boating lanes. In 2002, the contractor removed 85,000 lbs of vegetation from about approximately15 acres at a cost of $6670.00.

OTHER MANAGEMENT ACTIVITIES

Individual landowners have maintained their own immediate shorelines using low intensive activities such as raking and pulling plants.

Table 4 Chemical Treatment Summary - Bohners Lake*

Dates	Acreage	Chemicals Applied
June 1981	1.83	Aquathol K, Cutrine Plus
1983	25.5	Endothall, CuSO4
May, June, Aug 1988	27.3	Aquathol K, Cutrine Plus, 2,4-D
June, July 1989	6.6	Aquathol K, Cutrine Plus, Diquat
July 1990	5.5	Aquathol K, Cutrine Plus, 2,4-D
May, June 1992	7.35	Diquat, CuSO4
August 1993	3	Diquat, CuSO4
June 1994	6.93	Aquathol K, Cutrine Plus, 2,4-D
June 1995	6.1	Aquathol K, Cutrine Plus, 2,4-D
May 2000	3.9, 1.25, 3.9, 3.9	Cutrine Plus, 2,4-D, Diquat, Endothal
July 2000	3.9, .8, .85	Cutrine Plus, Diquat, Endothal
June 2001	5.5, 1.25, 1.25	2,4-D, Diquat, Endothal
Aug 2001	3.4, 5.4, .4, .4	Cutrine, plus, 2,4-D, Diquat, Endothal‘
May 2002	1.4, 4.4, 1.4	Cutrine plus, 2,4-D, Diquat
June 2002	8	Cutrine plus
July 2002	.92	Endothal
June 2003	4, 5, 4, 4.5	Cutrine plus, 2,4-D, Diquat, Endothal

*Source: WDNR

Chapter V

PLANT MANAGEMENT ALTERNATIVES

Control of exotic or nuisance plant species is an uphill battle. The very nature of the plant species survival provides the means to spread rapidly. Fragmentation is important for Eurasian watermilfoil. Wild celery can spread by releasing from the sediments and floating to new areas in late summer and fall. Curly-leaf pondweed spreads by creating turions from which new plants grow. It is now suspected that Eurasian watermilfoil can spread significantly through seeds as well as fragments (Aron, 2002).

Realistic expectations are important in aquatic plant management. It is unlikely that exotic plants species can ever be completely removed from a lake. It is more likely that a combination of lake management techniques, along with public education, are most effective in minimizing the long-term impact of exotic plant species in a lake.

A discussion of a variety of plant management alternatives follows.

NO MANAGEMENT

Nuisance levels of aquatic plants can be left to do what they will with no active management from people. Under this alternative, it should be expected that Eurasian watermilfoil will continue to expand its range in Bohners Lake. While the firm, sandy shorelines will not see much Eurasian watermilfoil growth, the soft sediment portions of the lake will likely see expanded areas of Eurasian watermilfoil. The downside of this is that the more shading from Eurasian watermilfoil, the less light can reach the native understory, further increasing water temperatures and reducing the native plant community, allowing Eurasian watermilfoil even more opportunity for growth. Expanded areas of Eurasian watermilfoil may impact the fisheries, increasing the areas for small panfish to hide from predators. While the short term cost of the No Management option is nothing, the long term cost may be higher than if even minimal management occurred. Once seed beds are established, and the nuisance plants shade out the natives, it may take aggressive, costly activities to re-established a balanced plant population.

Conclusion—Although No Management is technically a possibility for Bohners Lake, it should not be considered for the long term interest of the water resource.

DRAWDOWN

Drawdown can be used to control some plant growth. Use of this method entails dropping the lake X number of feet for a period of time. This exposes the plants to extreme temperatures, drying and freezing. Some plants respond very favorably to drawdown, while other plants react negatively, or unpredictably. Eurasian water milfoil and coontail react unpredictably (Nichols 1991). A source of water to refill the lake, and a means to draw the lake down, are also important considerations. The procedure is rarely effective. Some valuable plants can be destroyed while more nuisance plants can be encouraged. Time is also a factor in drawdowns. Usually a lake is drawn down for 4 to 6

months and often needs to be repeated for maximum effectiveness. Drawdown also reduces the recreational opportunities on the lake. Timing of a drawdown can have a negative impact on fisheries if spawning areas are no longer reachable by fish. Turtles and frogs hibernate in shoreline muds and can also be affected by drawdowns.

Costs associated with drawdowns depend on the outlet control structure. Pumping to lower the lake requires costs for equipment, electricity and staff. Costs can be minimal if the lake can be lowered by opening a gate.

Conclusion— Because of the high recreational demands on the lake, lack of an adequate control structure on Bohners Lake, and because it is not effective for controlling milfoil and chara, drawdown for the purpose of aquatic plant control on Bohners Lake is not recommended.

NUTRIENT INACTIVATION

Nutrient inactivation is used to control the release of nutrients, primarily phosphorus, from the sediments. One of the most common substances used is aluminum sulfate, or alum. The alum treatment creates a floc formation covering the bottom sediments, preventing phosphorus from being released into the water. Nonpoint source pollution controls must be implemented prior to the use of alum, or the floc will be covered with newer nutrients. Based on the volume of the lake and the cost of alum, an alum treatment on Bohners Lake would cost approximately $30,000.

This treatment will not prevent plant growth but will reduce problems from algae growth. Improved water clarity from an alum treatment may increase aquatic plant densities. Water chemistry information must be collected prior to use to ensure sufficient buffering exists to prevent acidification and aluminum toxicity. Waters deeper than five feet are usually treated with Alum. WDNR approval is required. Many of the areas with the existing nuisance conditions would not be treated with alum, so localized problems would not be corrected and in fact may be increased.

Conclusion—Without a more thorough review of water quality that determines nutrient release from the sediments is a problem on Bohners Lake, nutrient inactivation is not recommended at this time.

DREDGING FOR AQUATIC PLANT CONTROL

Dredging is most often used to increase depths for navigation in shallow waters, especially for channels, rivers, and harbors. Dredging for the sole purpose of plant control has met with mixed success. To be considered successful for aquatic plant control, dredging would need to bring the lake bed to depths beyond 15 feet deep, the maximum rooting depth in the lake. Dredging is the most costly form of plant management control. Costs range from $5.00 per cubic yard up to $20.00 per cubic yard depending on site conditions, method used and disposal costs. A WDNR permit is required.

Conclusion—Dredging for aquatic plant control would not be considered a viable alternative for Bohners Lake without a very high cost and considerable disruption of the aquatic environment. Dredging may be an option for areas on Bohners Lake to address other problems.

AERATION

Aeration entails installation, operation and maintenance of a system to artificially pump oxygen into the lake depths. Artificial aeration has been used to correct oxygen deficiency problems in lakes that produce numerous algae blooms and subsequent fish kills. Aeration is used when internal nutrient sources are high compared to external sources, if nuisance algae conditions exist, or if low oxygen levels are a problem. It is most useful on lakes with low dissolved oxygen levels and large internal releases of phosphorus.

Aeration is an expensive lake management technique. Initial capital costs for a lake this size is approximately $40,000 to $50,000 and an annual maintenance and operational cost of at least $5,000. Water quality problems may result with improperly sized aeration systems so initial planning and engineering must be done carefully to prevent creating greater problems. Annual operational problems and costs are difficult for small lake organization budgets and staff.

There has been no documented effect of aeration on plant growth. WDNR approval is required.

Conclusion—Bohners Lake has good water clarity, and good dissolved oxygen levels so aeration should not be considered at this time.

SCREENS/BOTTOM BARRIERS

Light screens are similar to window screens that are placed on the lake bottom to control plant growth. Screens come in rolls that are spread out along the bottom and anchored by stakes, rods, or other weights.

Screens create little environmental disturbance if confined to small areas that are not important fish or wildlife habitat. Although they are relatively easy to install over small areas, installation in deep water may require SCUBA. Screens must be removed each fall and reinstalled in spring. Care must be taken to use screens where sufficient water depth will reduce the opportunity for damage by outboard motors. Screens cost approximately $300 for a 700 sq. ft. roll. Screens may be used by individual home owners along their shorelines or piers to create swimming areas. A negative impact of using screens is that all plant species are affected, even native plants. WDNR approval is required.

Conclusion—Screens are a viable alternative for the limited applications by individual property owners to improve conditions in swimming areas, however, they are contradictory to the WDNR's goal of protecting native plants. They not viable for use on Bohners Lake.

BIOMANIPULATION

The use of biological controls for aquatic plant management purposes is currently limited to the grass carp and a few species of insects. Most of these controls are theoretically possible, however they have limited application. Non-native biological controls are risky: there are a number of instances where the solution caused new problems when a non-target organism was preferred. Biological controls also produce slower, less reliable, and less complete control than mechanical or chemical control activities.

Grass Carp (*Ctenopharyngodon idella* Val.) is an exotic species originally imported from Malaysia. It is considered to be a voracious eater of aquatic plants and prefers elodea, pondweeds and hydrilla. Studies have shown that Grass Carp can reduce or eliminate vegetation at low densities. Grass Carp generally will graze on more beneficial plants before going after Eurasian watermilfoil, thereby compounding nuisance problems. Overstocking can eliminate all plants. In the United States, only a few states allow the use of a sterile form of Grass Carp. Grass Carp are illegal in the State of Wisconsin and are not an option on Bohners Lake.

In British Columbia, Canada, the larval stage of two aquatic insects, the caddis fly (*Triaenodes tarda* Milne.) and the chironomid larvae (*Cricotopus* sp.) have been observed to graze on Milfoil plants. These two insect species are currently being studied as forms of biological controls.

Recently, a naturally occurring fungus (*Mycoleptodiscus terredtris*) has been observed to effectively control a species of Milfoil in New Hampshire.

A weevil (eurhychiopsis) has been found to help control Eurasian watermilfoil in some lakes in Wisconsin and Illinois. The weevil does major damage to the milfoil plant as it is closely associated with it during its entire life cycle. The adult female lays eggs on the tips of the milfoil. When the larvae hatch, they feed in the growing tips and then burrow into the stem. Pupation (when the larvae changes to an adult) occurs in the stem. In fall, adult weevils burrow into the shoreline litter until spring. Weevils mature from egg to adult within 30 days and reproduce from May through September. Lakes with intensive management using harvesters or chemicals are less likely to support good populations of the weevil. Weevils do not usually like other plants so it does not affect other plant species. Weevils are now available commercially. Although the weevils can dramatically impact milfoil beds, it may not be enough to control the nuisance. In Wind Lake in Racine County, the milfoil beds frequently reach the surface by mid-June, but the weevils' life-cycle on the lake does not begin to drop the milfoil until the beginning of July. This time lag can negatively affect the riparians acceptance of the weevil as a management technique.

Efforts to introduce the weevil into new lakes has not been successful enough to justify the expense of the weevils ($1.00 per weevil). Additional research is needed before many of the biomanipulation techniques can be commonly implemented in lake management. Of greatest importance is the need to establish whether a given biological control organism will not become a nuisance itself.

Conclusion—Neither the Grass Carp, insects, nor fungus are viable alternatives for Bohners Lake. No signs of the weevil have been found in Bohners Lake.

NATIVE SPECIES REINTRODUCTION

Native plants are being re-introduced into lakes to try to diminish the spread of exotics and to try to reduce the need for other, more costly, plant management tools. Native plants are usually less of a management problem because they tend to grow in less dense populations and are more often low-growing. Native plants also provide better food and habitat for fish and wildlife.

Careful consideration of the species introduced needs to be given to avoid creating another problem.

Due to the species diversity, and abundance of aquatic plants in Bohners Lake, native species reintroduction or expansion has only limited application as a plant management alternative. Small, isolated destruction or removal of Eurasian watermilfoil beds could be combined with planting or transplanting Chara, water lilies or a number of different pondweeds. The planting of native emergent plant species such as bulrushes and associated upland plantings along developed shorelines could be considered. The emergent plant species will provide a buffer zone between the water and shoreline thereby reducing the effects of wave action upon the shore, and therefore reducing erosion. The emergent plants also provide important habitat for fish and macro invertebrates as well as increase the aesthetic value of Bohners Lake. Emergent plants should blend into shoreline buffer zones to further enhance their environmental value.

Costs to conduct plantings vary with the number and type of plants, and whether volunteers or paid staff do the work. Successful plantings can be affected by a number of factors, including health of the new plants, weather, timing, bottom substrate, water clarity, and waterfowl grazing. The WDNR should be consulted before conducting any planting activities to ensure the protection of the resource, the necessity for a permit, and the likelihood of success.

Conclusion—Plantings may be considered by the District or individual landowners. Landowners should be encouraged to allow the shoreline edge to re-vegetate into a stable buffer zone. This could be done as simply as not mowing. This, along with supplemental plantings of native upland plants, would provide habitat for birds, turtles, frogs, and other wildlife, while helping to filter out nutrients and sediments. This will indirectly help with the in-lake nuisance aquatic plants by reducing the nutrients in the lake used by the plants, and by creating a more stable near-shore area. Natural shoreline vegetation also provides a natural barrier that Canadian geese avoid. Although an established buffer will require less work than a lawn, there will be maintenance required. This may include cutting, mowing, or elimination of exotic species such as purple loosestrife. Landowners should consult with a professional to determine specific maintenance requirements and scheduling for their shoreline buffers.

HAND CONTROLS

A method of aquatic plant control on a small scale is hand or manual controls. These can consist of hand pulling or raking plants. A rake with a rope attached is thrown out into the water and dragged back into shore. Plants are then removed and disposed of. Skimmers or nets can be used to scrape filamentous algae or duckweed off the lake surface.

Landowners may remove plants from an area up to 30 feet wide without a permit (NR 109). The 30-foot area includes the swimming and pier areas. Landowners may remove Eurasian watermilfoil and curly-leaf pondweed from the remainder of their shorelines without a permit. Removal of native plants beyond that allowed in the 30-foot area will require a WDNR permit.

Manual methods are more labor intensive and should be used by individuals to deal with localized plant problems such as those found around individual piers and swimming areas. Hand controls are very inexpensive when compared to other techniques. Various rakes and cutters are available for under $100. However, hand control is labor intensive and cutters pose risks to users because of their extreme sharpness.

Conclusion—Hand controls may be used by individual landowners to clear swimming areas. Landowners should be encouraged to be selective in their clearing, again focusing on Eurasian water milfoil, muskgrass, or curly-leaf pondweed (widgeon grass is rarely found near-shore). Landowners should maintain a natural area of vegetation both on their shoreline and in the water. The District may consider acquiring some rakes and cutters to loan out to property owners.

Riparian landowners may remove Eurasian watermilfoil and curly-leaf pondweed plants within their “riparian zone” without permit. Residents may remove plants in a single area that is not more than 30 feet wide, including any swimming and pier areas, as long as the area is not a WDNR Sensitive Area. However, because of the ease with which Eurasian watermilfoil spreads, landowners should not attempt to remove native plants. Doing so will create a far worse condition when Eurasian watermilfoil fills the void created by removing the native plants. Any additional removal may require a WDNR permit.

CHEMICAL TREATMENT

Chemical treatment for the control of aquatic plants is one of the more controversial methods of aquatic plant control. Debate over the toxicity and long term effects of chemicals continues in many communities. WDNR permit is required prior to any chemical treatment.

With chemical treatments, the plant material impacted by the treatment dies and contributes to the sediment accumulation on the lake bed. The decaying process of the plants uses oxygen. Depending on the chemical used, if too much plant material is treated at once, oxygen depletion may occur, stressing or killing fish.

Modern herbicides have been tested extensively to be sure they can be used safely. Tests include determining toxicity levels to be sure that humans, animals, and fish are not impacted. Test results

must also show that the herbicides do no bioaccumulate in fish or other organisms and that their persistence in the environment is low. Product labels contain the requirements for use. Material safety data sheets are available for all herbicides approved for use in Wisconsin. Chemicals must be used according to the approved use labels. Application rates, as well as any use restrictions, are indicated on the product labels. Licensed applicators must follow the label requirements.

Identification of the target species is very important. Different chemicals should be used for different plant species. Dosage also affects the results. Too little chemical may stunt growth but not kill the plant. Too much chemical may negatively impact fish, amphibians, or invertebrates. If native plant communities are destroyed by chemicals, the areas may be invaded by exotic plants such as Eurasian watermilfoil and curly-leaf pondweed. The formulation of the chemical, whether liquid or granular, is a factor to consider. Another factor to consider is the contact period the chemical would have with the vegetation.

Chemical treatment has the advantage of being more selective than harvesting. Chemical treatment may also be more appropriate in some situations, especially where mono-typic stands of exotics exist, in shallow water where harvesters cannot work. It may also be the method of choice to treat early infestations of Eurasian watermilfoil when hand-pulling cannot be used.

Chemical control has the advantage that it is economical and very effective. The herbicides have been extensively tested prior to approval for use to be sure they can be used safely. Tests include determining toxicity levels, bioaccumulation rates, and their persistence in the environment. Product labels contain the requirements for use. Chemicals must be used according to the approved use applications. Application rates, as well as any use restrictions, are indicated on the product labels. Licensed applicators must follow the label requirements.

Treatments often need to be repeated at least annually. A single season treatment will not permanently eliminate the nuisance. Unless the entire lake is treated, invasive plant material will quickly re-enter the area. Although “mail order” chemicals can be purchased, their use is strongly discouraged and should not be used without a permit from WDNR. They may be completely ineffective if they are used to try to treat the wrong plant species. Unregulated, uneducated use may result in overuse of a chemical and cause damage to the “good” weeds, fish and wildlife, and humans.

Under current laws, chemical treatment permits are issued for the shoreline areas, 150 feet out. It is possible to get a permit to treat beyond the shoreline zone, however extra planning and preparation will be required. A proposed whole-lake treatment for instance, will require a detailed plan that should include timing of treatment, dosage planned, pre-treatment data collection and a re-infestation plan.

Prior to any chemical treatment, a permit is required from WDNR. Only Wisconsin and EPA approved herbicides may be used, following all label directions and restrictions. In most situations, herbicides may only be applied by applicators certified in aquatic application by the Wisconsin Department of Agriculture. Proper handling and application techniques must be followed including those to protect the applicators. All applications must comply with current laws in the State of Wisconsin.

The following sections explain the types of herbicides available and their mode of operation.

Systemic Herbicides— Systemic herbicides are translocated throughout the entire plant, including the roots. Examples of systemic herbicides are 2,4-D, Fluridone, and trichlopyr. 2,4-D and trichlopyr are used to control Eurasian watermilfoil in localized areas. Fluridone is primarily used to control Eurasian watermilfoil in whole-lake or large-area situations.

Contact Herbicides — Contact herbicides kill the exposed portions of the plant that it comes into contact with. They are not translocated to roots and will only rarely kill entire plants. Herbicides with the active ingredients of diquat and endothall are common contact herbicides.

Copper Compounds — Copper sulfate is used for the control of algae. Cutrine Plus is an herbicide that uses copper as its active ingredient. This is used to control various types of algae. Although it can control Chara (also known as muskgrass), a more desirable algae, it is more commonly used to control filamentous, green and blue-green algae. Liquid formulations, especially the chopper chelated products (those combined with other compounds that help prevent the loss of active copper from the water) are more effective. These tend to remain in solution longer, allowing more contact time between soluble copper and the algae cells.

Aquathol — Super K is a formulation containing the active ingredient endothall. This is a contact herbicide that prevents certain plants from producing needed proteins for growth. It is used to control certain pondweeds, coontail, and Eurasian watermilfoil. The timing of an application affects what plants are impacted.

Reward — Reward, previously known as Diquat, is a non-selective contact herbicide that is used to control a wide variety of plants. It is absorbed by plants and damages cell tissues. Reward kills the parts of the plants that it comes into contact with directly. Reward loses its effectiveness in muddy, silt-laden waters. If too much plant material is killed in an area, the decomposing vegetation may result in very low oxygen levels that may be harmful or fatal to fish. Areas that are treated with Reward cannot be used for activities requiring full or partial body contact for at least 24 hours after treatment. Animal consumption, irrigation, and other domestic uses require waiting at least 14 days after treatment. Reward works quickly, with results usually seen in 6 to 10 days.

2,4-D (2,4-dichlorophenoxyacetic acid) — 2,4-D is a systemic herbicide which interferes with normal cell growth and division. Plants begin to die within a few days of liquid formulation treatments, and within a week to 10 days when granular formulations are used. The aquatic formulations of 2,4-D are only effective on certain species of aquatic plants. It is most commonly used to treat Eurasian watermilfoil. The timing and the dosage rate of an application is important to avoid impacting native plant species. Because it also impacts several desirable species including bladderwort, water lilies, and watershield, care should be taken to ensure that only the target nuisance plant species are present before treatment or that the dosage is low enough to protect natives.

Fluridone — Fluridone is an herbicide that inhibits the plant's ability to make food. Without that ability, the plant dies. The visual symptom of the effects of fluridone is bleaching of the terminal buds, or growing points, on the plant. This herbicide takes at least 30 to 45 days contact time to kill

the plant. This prevents problems with low dissolved oxygen in treated areas. Fluridone is rapidly diluted and best used in larger treatment areas, generally 5 acres or more in size, preferably on a whole-lake basis. Prior to treatment there should be good flow data for the proposed treatment area. Rates of inflow, outflows, and ground water sources should be known prior to treatment. Without this information, applied material can be quickly flushed from a system or rendered ineffective. Fluridone can be used for a range of plant control, from species specific control to general control. Fluridone achieves its selectivity by the use of varying dosages. High treatment dosages control a wide variety of aquatic plants, while low dosages maintained over long periods of time have been used to control Eurasian watermilfoil with minimal impact on native plants.

Trichlopyr — Trichlopyr is a newly-approved herbicide which kills the entire plant, and is effective at treating Eurasian watermilfoil. Trichlopyr is more suited to moving water applications than slow acting herbicides such as fluridone.

Conclusion— Use of chemical treatment on Bohners Lake is unusually complicated because of the nuisance species present in the most diverse areas. Usually 2-4-D is used on milfoil, but it is not effective on widgeon grass. Using Diquat to control the widgeon grass will mean that other plants in the area will also be affected even if they are beneficial species.

Native aquatic plant beds should not be chemically treated without a thorough review of the existing conditions. Changing plant conditions that create new shoreline nuisances may warrant chemical treatment of exotics. **Any chemical treatment conducted on Bohners Lake should only target the nuisance species.**

- There may be consideration given to treating Eurasian watermilfoil, muskgrass, widgeon grass, filamentous algae, and curly-leaf pondweed with the appropriate herbicide. Chemical treatment of the remaining plant communities would not be advised on Bohners Lake. It should be remembered that destruction of any native plant species populations will increase potential problems from Eurasian watermilfoil.
- Treatments should be planned to treat early enough in the season to eliminate the nuisance with the least amount of herbicide and before the native plants have been impacted by dense growths of nuisance plants.
- Proposed chemical treatments should be developed based on the existing nuisance. Shoreline muskgrass problems may be treated with Hydrothol, however, treatment areas should be restricted to boating lanes to ensure that muskgrass is removed only from areas necessary for access. Muskgrass treatments should take place only when a legitimate navigational concern exists. If muskgrass growth is within a foot or so of the surface in a navigational lane, treatment may take place.
- Filamentous algae should be treated early while the affected areas are small. Less chemical, as well as less potent chemical, will be needed to provide control.
- If conducted, curly-leaf pondweed treatments should be planned to try to prevent the production of turions, an important method of reproduction for the plant. The chemical treatment would help reduce the dormant apices[1] of the plant, another primary means of early

season reproduction (Nichols & Shaw 1986). These treatments would allow native plants a better opportunity for growth in the area.

- Bohners Lake may be a candidate for a Fluridone on a whole lake basis, however, further analysis should be done. While movement of water through Bohners Lake has been negligible the past 2 or 3 years, flow in the proposed treatment season would need to be considered. Removal of Eurasian watermilfoil lakewide would allow native plant species to thrive and spread in the areas currently dominated by Eurasian watermilfoil, however, other plants do contribute to the nuisance problem in Bohners Lake. Prior to applying for a whole lake permit, a treatment plan which evaluates further the State's criteria for whole lake permits to the conditions on Bohners Lake, should be developed as discussed earlier.
- Beach areas on Bohners Lake should be treated with contact herbicides to remove the plants in the areas for public safety. Elimination of native species in these areas is not a concern since the areas have consistently had the same plant communities come back each year.

HARVESTING

Selective harvesting is another lake management tool that is frequently used to control aquatic plants. Plants are cut off about five feet below the surface and conveyed to shore where they are then trucked to a disposal site. Harvesting aquatic plants removes biomass from the lake as well as nutrients. In the past, the presumption was that eventually plant growth in a lake with harvesting would cease to be a problem when nutrients have been removed. However, a lack of plant growth after harvesting will not normally be seen because incoming nutrients from the watershed will usually offset any nutrients removed during harvesting (Engel, 1990). The remaining plant material, that material below the cutting depth, will continue its life cycle. The decomposing material will contribute to the sedimentation in the lake, however, wind and wave action will move the material into deposition zones: usually the deep hole.

Harvesting must only be done in waters deeper than three feet. Harvesting should not be done in shallower areas because it will increase damage to the equipment, will disrupt bottom sediments and plants, and will open up lake sediments to invasion by exotic plant species.

Shoreline pickup programs can help control floating plant material (floaters) and plant debris, however, they are labor, and time intensive. They are very difficult to eliminate once the residents are used to the pickups. Debris that includes rocks, sticks, gravel, or other such material will damage the equipment. When plant debris is on shore, the equipment must go up to shore to retrieve it, disrupting the sediments and rooted plants in the process. Harvesters are very large pieces of equipment that are highly susceptible to wind and waves, and are difficult to maneuver. This increases the chances for damage to riparians' piers and boats. If a shoreline pickup program is considered, plant debris should be placed on the ends of piers whenever possible.

1. The apex of a plant is the end farther from the stem (Fassett 1957)

Harvesting of fish lanes can open up areas so game fish can feed upon panfish. It also helps increase the size of panfish that remain, and can increase the size of the predator fish (Nichols, 1988).

Harvesting can reduce the recreational boating's impact on aquatic plants by opening navigation lanes and lessening the amount of plants that are cut off by boating activities.

Recreational use in dense milfoil beds, winds, and waves can create large amounts of "floaters" that can increase the spread of milfoil. Collection of the floaters as part of a harvesting program can help minimize the spread of the nuisance. Plant fragments that are not removed from a lake can settle into new areas and spread the problem. This creates a greater problem on lakes which do not conduct chemical shoreline treatments for Eurasian watermilfoil.

Harvesting can also cause problems if it is not done properly. Machines that are not properly maintained can discharge gas, oils and grease into lakes. Cutting too close to shore or into the bottom sediments can disrupt fish spawning and nursery areas. The sediments are also very damaging to the harvesting equipment and will increase maintenance costs significantly. Attempting to operate the equipment in shallow water (less than three feet deep) will disrupt the sediments and aquatic plants.

Harvesting is non-selective, that is, it harvests all plants in its path. Areas with native plants should be avoided whenever possible. In an area with a mix of plant species, including Eurasian watermilfoil, harvesting favors the species that grow quickly. Because this is usually Eurasian watermilfoil, it leads to re-harvesting areas often over the summer season. Harvesting also removes fish, turtles and invertebrates.

In a mixed plant bed with both Eurasian watermilfoil and natives, cutting above the native plants will open up more sunlight to the understory, will encourage the native plant growth, and will remove any flowering portions of the Eurasian watermilfoil.

Because of the increasing concern of the role seeds play in the spread of Eurasian watermilfoil, areas dominated by Eurasian watermilfoid should be harvested early enough to prevent seed development.

Harvesting is a very costly management alternative. Purchase of equipment can exceed $100,000 in capital costs. State grants are only eligible to lakes which harvest a minimum of 30 acres, and have adequate public access. Although Bohners Lake has adequate access, not enough acreage is harvested, making the District ineligible for a grant. Only two contract harvesters are known to operate in Wisconsin, both charging approximately $125 per hour with a 40 hour minimum.

Conclusion—Harvesting on a limited basis has been shown to be effective at reducing the nuisances on Bohners Lake. Landowners should be encouraged to remove floaters from their shorelines. Material can be mulched or used in plant beds.

- Harvesting on Bohners Lake is not expected to take more than 2 weeks of harvesting, based on the current plant densities on the lake.

- Contract harvesting, properly supervised, should be considered to relieve nuisances and ensure access.
- The program should emphasize reducing nuisances rather than clear cutting.
- Harvesting should be used to remove large stands of Eurasian watermilfoil and curly-leaf pondweed.
- It can also be used to remove filamentous algae-covered nuisance beds such as that found near the shoal.
- Harvesting may be used to cut boat lanes through dense vegetation to provide access.
- Because contract time is limited, harvesting should begin with the boat lanes to ensure access for riparians, then work should begin on large dense stands of nuisance plants.
- Harvesting of muskgrass should not be done because on Bohners Lake the muskgrass problem occurs in shallow water (less than 3 feet deep). Control of muskgrass problems should be limited to chemical treatment.

LOCAL ORDINANCES AND USE RESTRICTIONS

Lake use ordinances have long been used to control activities on lakes. Local communities may adopt ordinances to protect public health, safety and welfare. Any proposed ordinances are sent to the DNR for review to be sure they comply with State Statutes. Ordinances must address issues that threaten public health, safety and welfare. Once approved by DNR, communities may then finalize and enforce the ordinances.

Historically, public health, safety and welfare was interpreted to mean peoples' physical issues associated with using the lake. Speeding and reckless use endanger lives and are usually controlled through local ordinances.

Recently there has been a growing realization that the lake's health has a bearing on public welfare. Lake use activities conducted in inappropriate areas of lakes can be very damaging to the lake ecosystem. Spawning habitat can be destroyed. Wildlife can be chased away. Aquatic plant communities can be disrupted, shifting the communities to plants less beneficial than the original.

With the state's acceptance of the environmental health premise, communities are looking at lake use zoning. Some have shoreline zones that are no slow wake. Others have restricted some or all of the lake to no-motors. Protection of specific species or valuable areas can be achieved by developing an ordinance to minimize intrusions.

Costs associated with ordinance development depends upon the problem, potential solutions, municipal cooperation, and municipal legal reviews. Grants are available through the DNR to develop ordinances.

It is important to keep in mind the following in the development of ordinances:

- Any proposed ordinance must have prior review by the DNR.
- An ordinance must not discriminate on a particular craft, ie, if motors damage an area, all motors should be restricted not just ski boats.

- An ordinance must be clearly understood and posted. Buoys (which must also be approved by the DNR) should warn boaters of areas to avoid.
- Any ordinance should address a particular problem. If boating damages a sensitive area of the lake, allowing boats in the area on alternating days does not achieve the protection sought.
- An ordinance must be reasonable and realistic. An ordinance that creates a slow no wake zone that affects all of the lake area less than three feet deep may not be enforceable. The general public could not know the extent of that area. A more reasonable approach would be to review the desired area and develop a plan based on a specific distance from shore. Buoys could then be used to identify that area.
- An ordinance should be studied to ensure that it does not aggravate a different problem. Many communities have shoreline slow no wake zones that exceed that of state law. On a small lake, enlarging that shoreline zone may provide more resource protection. It may also further concentrate other lake use activities such as skiing into an area too small to be safe.
- Any attempts to restrict lake use should be weighed along with the social and economic impacts. It is well documented that those most involved with lakes and lake protection are those same people who spend the most time on or around lakes. They either live on or have easy access to a lake. It is very difficult to convince outsiders that lake quality is a concern or that funds should be spent because they do not have a personal involvement. They have other priorities. Reducing public use of a lake will have a direct affect on their involvement and possibly their social and economic concern about a lake.

Conclusion—Lake use ordinances may be considered for Bohners Lake, however, they should be carefully developed and studied to ensure that they address the problems without undue restrictions and that they will actually be enforced.

Chapter VI

PLANT MANAGEMENT PLAN

GOALS AND OBJECTIVES

The District's goal is to optimize the preservation of aquatic systems that includes water quality, fisheries, and wildlife while minimizing the conditions resulting from aquatic nuisances and to preserve and maintain recreational uses of Bohners Lake. To achieve the goal, the development of this plan is one component of an effort that has included water quality monitoring, community surveys, aquatic vegetation surveys, and wetland inventories.

The District desires to (listed in order of local importance):

- Control exotic and nuisance plant species. by:
  - —use of chemical treatments of nuisance species at least once per season.
  - —contract-harvesting between 40 and 80 hours per season.
  - —encouraging landowners to protect native species.
- Preserve and enhance the natural lake environment by.
  - —educating landowners and lake users in lake ecology.
  - —working with local governments to develop and enforce ordinances to protect Bohners Lake.
  - —continuing to monitor the wetland restoration project within the watershed.
- Identify and expand local educational efforts that the District may undertake to improve the public's understanding of lake issues by:
  - —conducting community survey of residents and landowners within the next four years.
  - —distributing at least 2 newsletters annually.
  - —encouraging community participation in lake management activities.
- Conduct in-lake management activities with the long-range goal of minimizing management to the extent possible by:
  - —conducting year-end evaluations as to the success of plant management activities and the community reaction to the activities.
  - —tracking annual progress of lake management activities.

RECOMMENDATIONS

Management efforts should be directed toward protection and maintenance of the resource with a primary focus on controlling Eurasian watermilfoil and curly-leaf pondweed.

The large shoal on the Southwest end of the lake near the inlet should be re-evaluated every two or three years. If the shoal continues to be dominated by Eurasian watermilfoil and curly-leaf pondweed, the area should be chemically treated in late May or early June. If the shoal begins to shift to

an area with more native pondweeds, the nuisance species should be harvested by topping the plants to prevent seeding and turion production.

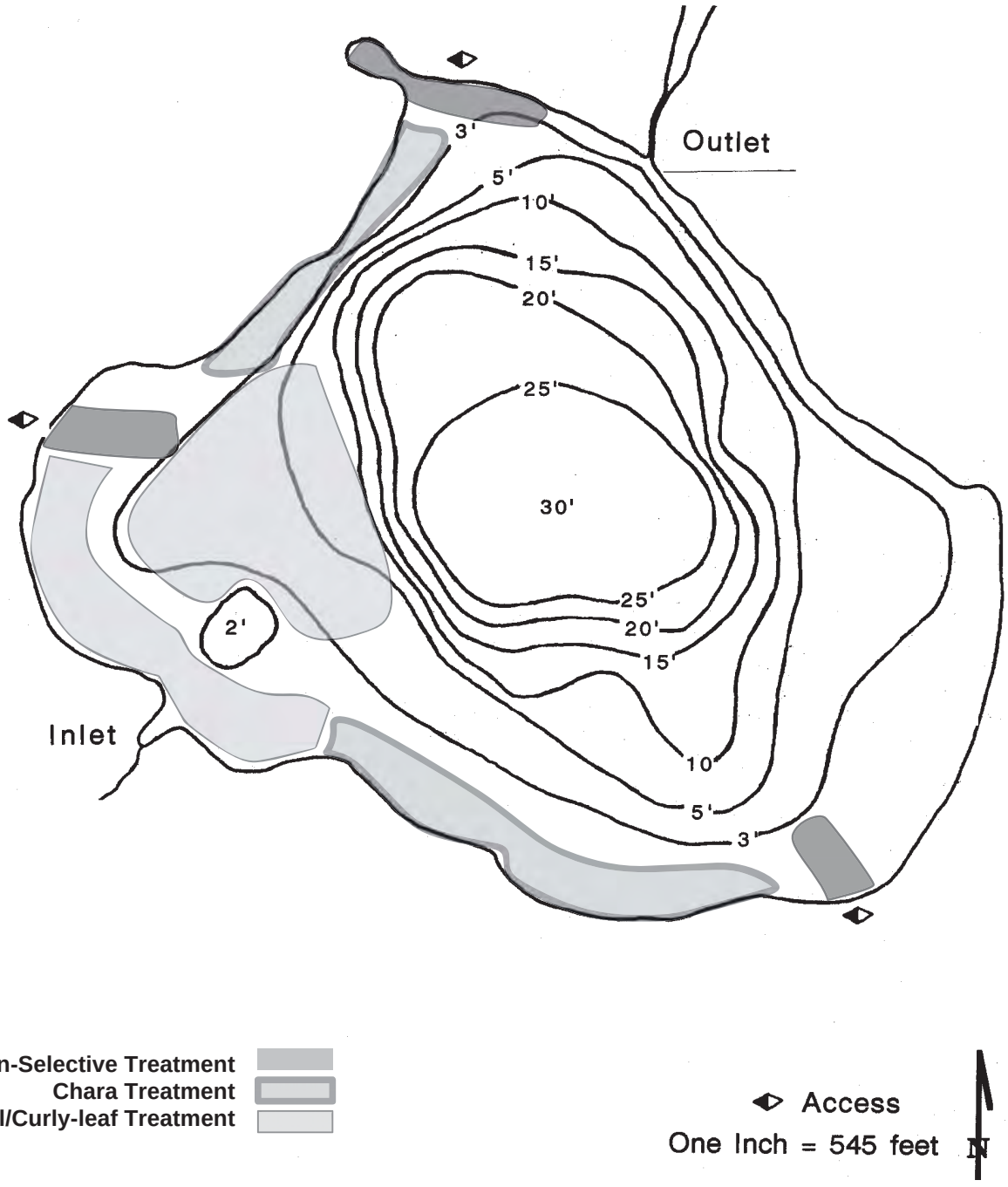
Chemical Treatment

- The District may continue to use chemicals to control nuisance plants. Treatments should minimize the effects on non-target plants. Care should be taken to avoid treating too much plant material at a time. Earlier, rather than later season treatments will accomplish this. Waiting until there are high densities to treat could place undue stress on the fish community by reducing oxygen concentrations post treatment.
- In the most diverse areas of the lake, treatment should focus on Eurasian watermilfoil. The shoal area may also be treated for curly-leaf pondweed. That should be done as early as possible to allow native plants the opportunity to grow without the shading and crowding from the early, very dense, curly-leaf populations.
- Shallow areas, specifically along the West and South shores in the three foot depths, may be treated for muskgrass. Hydrothal may be used *sparingly* to control muskgrass. This should only be done in areas where muskgrass is very dense, is a severe problem to boat traffic, and where very few other plants are present.
- The swimming beaches may be treated with non-selective herbicides to provide safe swimming conditions, limiting the non-selective treatment to the areas within the swimming buoys. Map 9 illustrates the areas for chemical treatments.
- The navigational channel on the Northwest shoreline may be treated with non-selective herbicides to maintain access.
- Based on conditions over the past 6 years, targets species for chemical treatment include: Eurasian watermilfoil, curly-leaf pondweed, muskgrass, widgeon grass, and filamentous algae.

WDNR Administrative Rule NR 107 should be consulted for the specific requirements for conducting a treatment. The following are some of the steps that should be followed by the District when preparing to conduct chemical treatments.

- Complete and submit the WDNR permit application forms. Include treatment map, area sizes and name and addresses of all affected riparian landowners.
- Contact licensed firm to coordinate proposed treatment.
- When treatment areas will be greater than 10 acres, a public notice should be placed in the local paper informing the public about the proposed treatment. This will also inform those who may be using the public beaches.
- Provide a copy of the WDNR application to any riparian landowner who is adjacent to the proposed treatment areas. This may be done by newsletter, or box drops.
- At the time of treatment, WDNR approved yellow posting signs must be posted in and adjacent to treatment areas, at least every 300 feet. The signs must indicate what chemical has been used, and any use restrictions and must remain posted for at least the time of any restrictions.
- Current administrative codes should be reviewed annually to ensure compliance.

Map 9 - Chemical Treatment Areas on Bohners Lake - 2003



Although downstream impacts should be considered when planning chemical treatments, on Bohners Lake, the closest treatment area is only 200 by 150 feet and is more than 600 feet from the outlet. The quantities of chemicals used would be very diluted and ineffective if spread to the outlet. The recommendations in this plan assume that treatments will be conducted according to label restrictions and permits.

Harvesting

- The District may wish to consider the use of contract harvesting to provide relief from extreme nuisance conditions.
- Any harvesting done should be carefully planned to avoid beneficial plants. as much as possible.
- No harvesting should be done in shallow waters less than three feet deep.
- Native plants may be harvested if necessary to open access lanes.
- Pre-dominantly Eurasian watermilfoil areas should be “topped”, that is, the top 4 or 5 feet of plant material should be harvested, cutting above any native plants. This will allow light to reach the natives and will encourage their growth.
- Approximately 38% (51 acres) of the Bohners Lake surface area is between 3 and 15 feet deep, the actual area harvested annually is less than 20 acres. Because of the high cost, workload involved, and the small volume of plants harvested, it is not recommended at this time that harvesting equipment be purchased.

WDNR Administrative Rule NR 109 should be consulted for the specific requirements for conducting harvesting. The following are some of the steps that should be followed by the District when preparing to harvest.

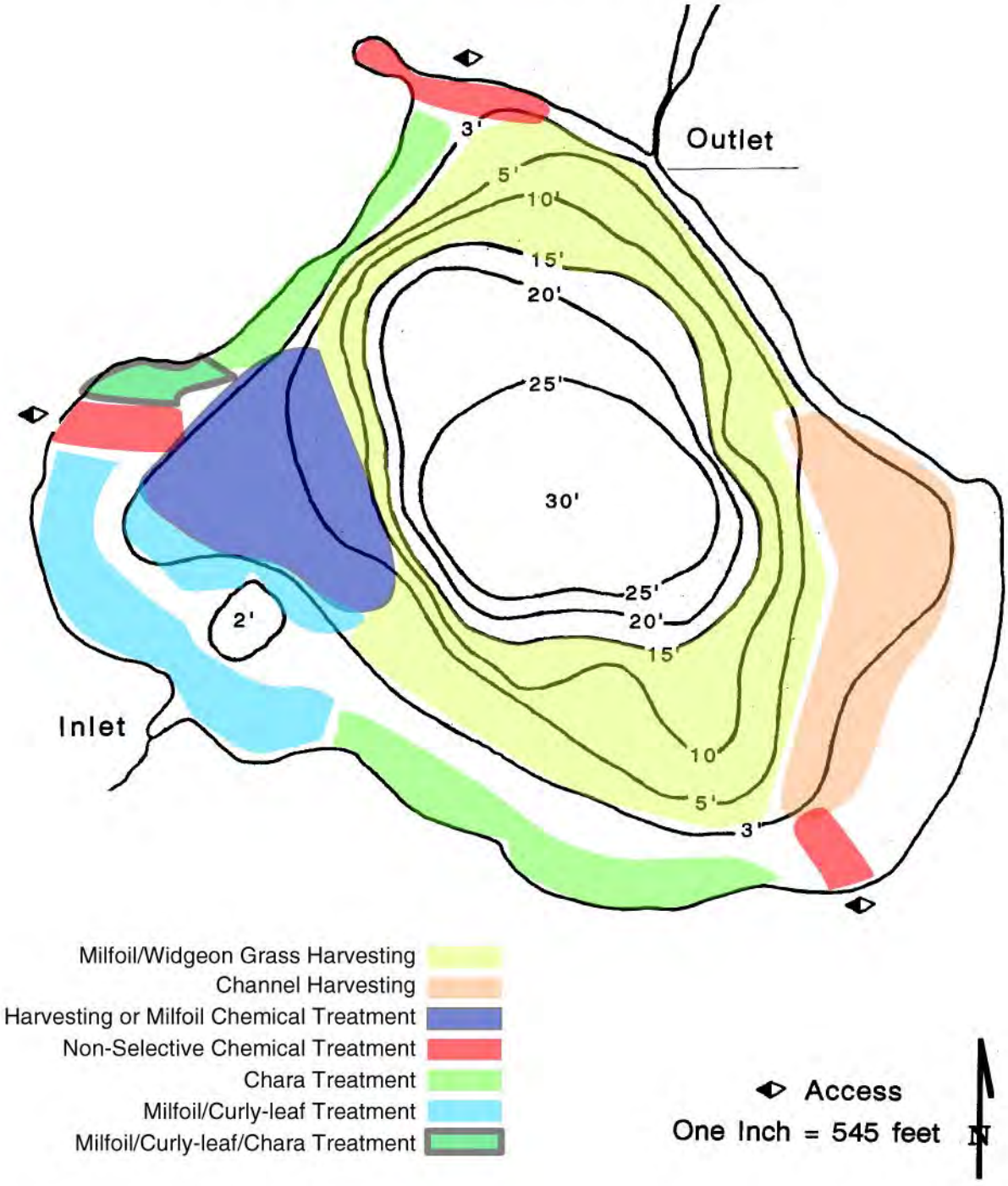
- Complete WDNR permit application forms. Include map, area sizes and name and addresses of all affected riparian landowners.
- Contract harvesting company.
- Current administrative codes should be reviewed annually to ensure compliance.

Map 11 illustrates the Plant Management Activities for Bohners Lake.

Map 10 - Harvesting Areas on Bohners Lake - 2003



Map 11 - Plant Management Plan for Bohners Lake - 2003



Aron & Associates, 2003

Hand Controls

Riparians should be encouraged to use the least intensive method to remove nuisance vegetation. This could include minimal raking and pulling. Landowners amy remove plants from an area up to 30 feet wide without a permit. The 30 foot area includes the swimming and pier areas. Landowners may remove Eurasian watermilfoil and curly-leaf pondweed from the remainder of their shorelines without a permit. Removal of native plants beyond that allowed in the 30-foot area, will require a WDNR permit. If screens are considered by individuals, a WDNR permit will be required.

Riparians should be encouraged to allow some native plants to remain. This will help prevent infestation of the areas by Eurasian watermilfoil or curly-leaf pondweed. The native plants will also help stabilize the sediments.

The District should encourage landowners to use hand controls to manage the aquatic nuisances. Small swimming areas can be manually cleared without damaging the resource. The District may wish to consider acquiring rakes and cutters to loan to lake residents. Another idea the District may consider is to match energetic teens seeking summer help with those physically unable to do hand clearing.

The District should inform landowners about the importance of keeping their shorelines free of floating plant debris. Wave action can carry plant fragments into new areas, possibly aggravating nuisance conditions. Plant debris can be used in mulch piles or gardens.

Education and Information:

The District should take steps to educate property owners regarding their activities and how they may affect the plant community in Bohners Lake. Informational material should be distributed regularly to residents, landowners, and lake users and local government officials. A semi-annual or quarterly newsletter to landowners and residents should be part of the annual plant management budget. Topics should include information relating to lake use impacts, importance and value of aquatic plants, land use impacts, etc. Information on shoreline restoration and plantings can be provided. Publications are available that list sources of plants and methods of creating buffers. Other issues that should be addressed may include landscape practices, fertilizer use, and erosion control. Existing materials are available through the WDNR and the UWEX. Other materials should be developed as needed.

The District should also enlist the participation of the local schools. The schools could use Bohners Lake as the base for their environmental education programs. Burlington Schools have a mandatory community service requirement that may be tapped to assist with lake management activities. Regular communication with residents will improve their understanding of the lake ecosystem and should lead to long term protection.

The District should continue to inform residents about the lake management activities that are undertaken and the reasons behind the activities.

Watershed Controls

The District should continue aggressive improvement of water runoff into Bohners Lake. All areas of the watershed should be toured regularly for identification of new problems. The District should attempt to acquire the agricultural lands that are identified in the RA Smith watershed report to be a problem for the lake. If acquisition is not possible an easement on the downslope portions of the land will also provide beneficial protection. The District should continue to maintain contact with the WDOT on the "mint field" wetland restoration progress during construction of the Burlington bypass.

The District should work with the Township officials to encourage rigid enforcement of erosion control in the watershed and consideration of lake-friendly methods of development and road construction. The District should also work with the County Conservation Department and the Natural Resource Conservation Department to improve participation in programs such as the Conservation Rehabilitation and Enhancement Program (CREP) that will protect Bohners Lake.

Land Use Planning

The District should take an active role in land use planning decisions in the Township. Development proposals should be analyzed with the lake in mind and revised if necessary to protect the lake from damaging runoff. Long range planning should also involve the District to ensure that future development includes lake protection.

Storm Water Planning

The District should review any new development proposals to ensure that the lake will not be damaged by changes in flows or quality of stormwater. The District may consider applying for grants to assist with land use and storm water planning. The District may assist the County and Town to develop and implement storm water ordinances. Another option to consider is the use of phosphorus-free or no phosphorus fertilizers. Some communities are considering fertilizer restrictions to protect their lakes.

Ordinances

The District may consider the development of ordinances. One possible area to protect is the shallow gravel area just out from the inlet. It should be noted that passing ordinances does not in and of itself, correct a problem. Enforcement is a key component of any ordinance development.

Contingency Plans

The District should be prepared for changing aquatic plant conditions that may fall outside the recommendations in this Plant Management Plan. While the final determination will be permitted by WDNR, developing local consensus on possible solutions is often needed. In evaluating whether to treat or harvest a "new" nuisance condition, the following should be considered:

- ***Are the plants native or exotic species?***
  If unsure, consult WDNR or an aquatic plant specialist to determine the species.

- ***Is the area in shallow or deep water?***
  This quickly limits some of the options. Harvesting, for instance, cannot be used in water less than 3 feet deep.

- ***Is the condition impeding or preventing recreational use, or is something else a factor?***
  Access channels may be created either by harvesting or chemical treatment. However, if water depth prevents access during a drought, chemical treatment will not open up boating access, but it may eliminate a filamentous algae causing odor problems.

- ***Is the situation creating unsafe condition?***
  Dense, stringy weeds in a beach area, for instance, could create dangerous conditions for young swimmers.

- ***Will the considered option improve the situation long term or short term?***
  The short term solution may eliminate the problem this summer, but make it worse in future years, while the long term solution may be the best over the long haul.

- ***Is the considered option detrimental to fish, wildlife, or humans?***
  If it is, maybe there are other options to solve the problem that would be safer.

- ***Will the considered option increase the invasion by other nuisance species.***
  Consider whether the option will create “bare” lakebed that will quickly be invaded by weedy species, or whether the option will protect desirable vegetation while removing the nuisance.

Chapter VII

PLAN EVALUATION AND REASSESSMENT

This plant management plan provides options for plant management from which the community may select to accomplish their goals.

Future evaluation of the effectiveness of this plant management plan and the subsequent implementation efforts undertaken by the District should be based on whether the lake is in “better condition” from a nuisance aquatic plant situation:

- Have native aquatic plants increased in densities and diversity;
- Have nuisance species decreased in density and coverage;
- Has water quality or clarity improved;
- Does the general public, and more specifically, do the District residents, have a better understanding of the lake, its environment, and the impacts on the resource;
- Do the District residents support the plant management activities of the District;
- Has the District been able to prevent exotic species invasions;
- Are there ongoing public education efforts such as newsletters, websites, public meetings, etc; and are they being used by the public.
-

The District should review or contract to review, the plant populations of Bohners Lake every three to five years. A summary of the past years management activities should be developed annually to facilitate comprehensive review of the entire program and effectiveness. The management plan should also be reviewed, and if necessary modified, every three to five years, to ensure its appropriateness to any changing conditions.

Chapter VIII

SUMMARY

- The management of aquatic plants on Bohners Lake should focus on management of nuisance species.
- The District should encourage landowners to grow more natural shorelines and emergents to minimize the areas disturbed for lake use.
- The District should provide landowners with information on erosion control, especially on the steeper shorelines.
- The District should distribute informational materials regularly to residents on such topics as proper lawn and garden practices, land use impacts and the importance and value of aquatic plants.
- Property owners should restrict the use of hand controls and bottom barriers to control Eurasian water milfoil and curly-leaf pondweed only and should minimize the size of any areas that are cleared.
- Property owners should keep their shorelines free of floating plant debris to prevent spreading nuisance plants.
- The District may consider acquiring hand rakes and cutters to loan to property owners for localized control.
- The District may continue to use contract harvesting.
- Chemical treatments may continue, planning each treatment to ensure that only the target plants are affected.

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LOCAL CONTACTS

RACINE COUNTY

County Web Site www.racineco.com

County Executive	Phone: 262-636-3273
Office of the County Clerk Racine Courthouse 730 Wisconsin Ave Racine, WI 53403	Phone: 262-636-3121
Clerk of Circuit Court	Phone: 262-632-3770
Human Resources Department	Phone: 262-638-6680
Public Works/Parks 14200 Washington Ave Sturtevant, WI 53177	Phone: 262-886-.8440
Birth & Death Certificates, Marriage Records Register of Deeds	Phone: 262-636-3208
Racine/Kenosha UW Extension Service 14200 Washington Ave Sturtevant, WI 53177	Phone: 262-886-8470
Racine County Planning and Development 14200 Washington Ave Sturtevant, WI 53177	Phone: 262-886-8460
Racine County Historical Society 701 S Main St Racine, WI 53403	Phone: 262-636-3926

Wisconsin Department of Natural Resources

Water Resources and Chemical Permit Applications	Craig Helker (262) 884-2357
Water Reg and Zoning	Shane Heyel (262) 884-2356
Lake Planning Grant and Lake Protection Grant Applications	Heidi Bunk (262) 574-2130
Fisheries	Doug Welch (262) 884-2364

University of Wisconsin Stevens Point

Lake Specialists	Tamara Dudiak (715) 346-4744 Bob Korth (715) 346-2192
Project WET Coordinator	Mary Pardee (715) 346-4978
Adopt-A-Lake	Laura Felda (715) 346-3366

Wisconsin Association of Lakes (608) 662-0923

GLOSSARY

acid

Corrosive substances with a pH of less than 7.0.

acid rain

A polluting rain in which sulfur oxides from fossil fuels react with water vapor in the environment to form sulfuric acid.

adaptation

Any structure, the means an organism has to make them more likely to survive.

aerobic

Processes requiring oxygen.

algae

Microscopic organisms/aquatic plants that use sunlight as an energy source (e.g., diatoms, kelp, seaweed). One-celled (phytoplankton) or multicellular plants either suspended in water (Plankton) or attached to rocks and other substrates (periphyton). Their abundance, as measured by the amount of chlorophyll a (green pigment) in an open water sample, is commonly used to classify the trophic status of a lake. Algae are an essential part of the lake ecosystem and provides the food base for most lake organisms, including fish.

algal bloom

Population explosion of algae in surface waters. This may be caused by an increase in nutrients.

alkalinity

The ability of water, or other substances, to absorb high concentrations of hydrogen ions. Substances with a pH greater than 7.0 are considered alkaline. Low alkalinity is the main indicator of susceptibility to acid rain.

ammonia

A form of nitrogen found in organic materials and many fertilizers.

anaerobic

Living or occurring without air or free oxygen.

annual

A plant that completes its life cycle in one year or one season.

annual turnover

This is when the lake mixes entirely from top to bottom.

aquatic

Organisms that live in or frequent water.

aquatic invertebrates

Aquatic animals without an internal skeletal structure such as insects, mollusks, and crayfish.

aquatic plants

Plants that grow and live in water. They may be floating, submerged or emergent.

asexual

Reproducing by fragmentation, turions, tubers, and/or other vegetative structures.

basic

Alkaline.

benthic zone

The bottom zone of a lake.

benthos

Organisms living on, or in, the bottom material of lakes and streams.

biomass

The total quantity of plants and animals in a lake. It indicates the degree of a lakes system's eutrophication or productivity.

blue-green algae

Algae that are associated with problem blooms in lakes. Some produce chemicals toxic to other organisms.

bog

An area characterized by soft, water-logged soil with mosses and other vegetation as the dominant plants.

calcium (Ca++)

The most abundant cation found in Wisconsin lakes. Its abundance is related to the presence of calcium-bearing minerals in the lake watershed. Reported as milligrams per liter (mg/l) as calcium carbonate (CaCO3), or milligrams per liter as calcium ion (Ca++).

cation

This refers to chemical ions that carry a positive charge. Some cations present in lakes are calcium (Ca++), magnesium (Mg++), potassium (K+), sodium (Na+), ammonium (NH4+), ferric iron (Fe+++) or ferrous iron (Fe++), manganese (Mn++), and hydrogen (H+).

chloride (Cl-)

Is considered an indicator of human activity. Agricultural chemicals, human and animal wastes, and road salt are the major sources of chloride in lake water.

chlorophyll

A green pigment found in plants that is necessary for the process of photosynthesis.

clarity

Secchi disc is an 9-inch diameter plate with black and white painted sections that is used to measure water clarity (light penetration). The disc is lowered into water until it disappears from view. It is then raised until just visible. An average of the two depths, taken from the shaded side of the boat, is recorded as the Secchi disc reading. The readings should be taken on sunny, calm days.

conductivity (specific conductance)

Is the waters ability to conduct an electric current.

cultural eutrophication

Eutrophication that happens as a result of human activities when increased nutrients in runoff water drains into lakes.

decompose

Breakdown of organic materials to inorganic materials.

dissolved oxygen (DO)

The amount of free oxygen absorbed by the water and available to aquatic organisms for respiration.

diversity

Number of species in a particular community or habitat.

drainage basin

The total land area that drains toward the lake.

drainage lakes

Lakes fed primarily by streams and with outlets into streams or rivers. They are more subject to surface runoff problems but generally have shorter residence times than seepage lakes. Watershed protection is usually needed to manage lake water quality.

ecosystem

A system formed by the interaction of a community of organisms.

epilimnion

The epilimnion is the warm upper layer of a lake when the denser, colder water is on the bottom during stratification.

erosion

Movement of soil by water and wind.

eutrophication

The process by which lakes and streams are enriched by nutrients which results in increased plant and algae growth.

exotic

A non-native species of plant or animal that has been introduced.

filamentous algae

Algae that forms filaments or mats attached to sediment, weeds, piers, etc.

food chain

An arrangement of the organisms in an ecological community according to the order of predation in which each uses the next, usually lower, member as food source.

groundcover

Plants grown to keep soil from eroding.

habitat

The place where an animal or plant lives; its living and non-living surroundings.

herbicides

Chemicals designed to kill a variety of undesired plant species.

hydrologic (water) cycle

The process by which the earth's water is recycled. Atmospheric water vapor condenses into the liquid or solid form and falls as precipitation to the ground surface. This water moves along or into the ground surface and finally returns to the atmosphere through transpiration and evaporation.

hydrology

Study of the distribution, circulation, and properties of water.

hypolimnion

The lower, more dense, colder waters on the bottom of stratified lakes is the hypolimnion.

impervious surface

Ground cover that does not allow for infiltration of water, such as roads and parking lots, and increases the volume and speed of runoff after a rainfall or snow melt.

limiting factor

The nutrient or condition in shortest supply relative to plant growth requirements. Plants will grow until stopped by this limitation; for example, phosphorus in summer, temperature or light in fall or winter.

limnology

The study of inland lakes and waters.

littoral

The near shore shallow water zone of a lake, where aquatic plants grow.

macrophytes

Refers to plants growing in or near water. Macrophytes are beneficial to lakes because they produce oxygen and provide substrate for fish habitat and aquatic insects.

marl

White to gray accumulation on lake bottoms caused by precipitation of calcium carbonate (CaCO3) in hard water lakes. Marl may contain many snail and clam shells, which are also calcium carbonate. While it gradually fills in lakes, marl also precipitates phosphorus, resulting in low algae populations and good water clarity.

metalimnion

This is the thin layer in a stratified lake that lies between the hypolimnion and the epilimnion.

non-point source

A source of pollution that comes from a variety of sources instead of a pipe.

nutrients

Elements or substances such as nitrogen and phosphorus that are necessary for plant growth. Large amounts of these substances promote excessive plant growth.

pH

The numerical value used to indicate how acid or alkaline a solution is. The number refers to the number of hydrogen ions in the solution. The pH scale ranges from 1 to 14 with 7.0 being neutral. Acid ranges from 0 to 6. Alkaline ranges from 8 to 14.

phosphorus

Key nutrient influencing plant growth in more than 80% of Wisconsin lakes. Soluble reactive phosphorus is the amount of phosphorus in solution that is available to plants. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particulate form.

photosynthesis

The process by which green plants create food and oxygen.

phytoplankton

Microscopic plants and algae found in the water.

plankton

A small plant organisms and animal organisms that float or swim weakly through the water.

point source pollution

Air or water pollutants entering the environment from a specific point such as a pipe.

pollution

The contamination of water and other natural resources by the release of harmful substances into the environment.

ppm

Parts per million.

retention time

(Turnover rate or flushing rate) The average length of time water resides in a lake. This can range from several days in small impoundments to many years in large seepage lakes.

runoff

The portion of rainfall, melted snow, or irrigation water that flows across the land surface or through pipes and eventually runs into lakes and streams.

seepage lakes

Lakes without a significant inlet or outlet, fed by rainfall and groundwater. Seepage lakes lose water through evaporation and groundwater moving on a down gradient. Lakes with little groundwater inflow tend to be naturally acidic and most susceptible to the effects of acid rain. Seepage lakes often have long residence times and lake levels fluctuate with local ground water levels. Water quality is affected by groundwater quality and the use of land on the shoreline.

thermocline

Stratification is the layering of water due to differences in density. Water's greatest density occurs at 39 ×F (4 ×C). As water warms during the summer, it remains near the surface while colder water remains near the bottom. Wind mixing determines the thickness of the warm surface water layer (epilimnion), which usually extends to a depth of about 20 feet. The narrow transition zone between the epilimnion and cold bottom water hypolimnion) is called the metalimnion or thermocline.

trophic state

Eutrophication is the process by which lakes are enriched with nutrients, increasing the production of rooted aquatic plants and algae. The extent to which this process has occurred is reflected in a lakes trophic classification or state: oligotrophic (nutrient poor), mesotrophic (moderately productive), and eutrophic (very productive and fertile).

turbidity

Degree to which light is blocked because water is muddy or cloudy.

turnover

Fall cooling and spring warming of surface water increases density, and gradually makes temperature and density uniform from top to bottom. This allows wind and wave action to mix the entire lake. Mixing allows bottom waters to contact the atmosphere, raising the water's oxygen content. However, warming may occur too rapidly in the spring for mixing to be effective, especially in small sheltered kettle lakes.

watershed

The land area draining into a specific stream, river, lake or other body of water. These areas are divided by ridges of high land.

wetlands

Low-lying lands in which the soil is saturated with water at some time during the year.

zooplankton

Microscopic or barely visible animals that eat algae. These suspended plankton are an important component of the lake food chain and ecosystem. They are the primary source of food for many fish.

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BOHNERS LAKE DATA 2003

YEAR	TRAN	DEPTH	MYRSPS	CHARA	POTCR	CERDE	RUPMA	POTPE	ELOCA	LEMMI	NAJFL	POTGR	VALAM	NI
2003	1	2												
2003	1	4		3	2			1				3		
2003	1	7	1		3			3	2					
2003	1	10												
2003	2	2		3	2			1				1		
2003	2	4		4				3	1					
2003	2	7	4	1	4		3	3						
2003	2	10	2		4			1						
2003	3	2		2										
2003	3	4		3	1		4	3						
2003	3	7		2	1		4							
2003	3	10	2	3			3							
2003	4	2		4	1		4							
2003	4	4		3	2		3							
2003	4	7		4			5							
2003	4	10	2		4	3	3							
2003	5	2						1						
2003	5	4						2						
2003	5	7		4			4							
2003	5	10	3		4	2	5							
2003	6	2			1			1						
2003	6	4					2							
2003	6	7					4							
2003	6	10	1		1	3	4							
2003	7	2	2			1		2						
2003	7	4	2	3	1			2						
2003	7	7		4				2				2		
2003	7	10				1	3							
2003	8	2		3										
2003	8	4		4	1		1	1						
2003	8	7	1		2		4							
2003	8	10	2		1	1	3							
2003	9	2		2								1		
2003	9	4	1	3				1						
2003	9	7	2				4	1						
2003	9	10	1	2			2							
2003	10	2		3										
2003	10	4		4				1						
2003	10	7		4			3	2						
2003	10	10					4							
2003	11	2		3				2						
2003	11	4		4				2				1		
2003	11	7		2	1		3	3				3		
2003	11	10												
2003	12	2		2										
2003	12	4		3			1		2		1	1		
2003	12	7	3				3	2				2		
2003	12	10	3				4							

YEAR	TRAN	DEPTH	MYRSPS	CHARA	POTCR	CERDE	RUPMA	POTPE	ELOCA	LEMMI	NAJFL	POTGR	VALAM	NI
2003	13	2		2										
2003	13	4		3			2							
2003	13	7	4	1			2	1						
2003	13	10	3				3							
2003	14	2												
2003	14	4												
2003	14	7	3											
2003	14	10	4											
2003	15	2												
2003	15	4	2		1			2				3		
2003	15	7		1			3	3				3		
2003	15	10												
2003	16	2												
2003	16	4	2				3	4				4		
2003	16	7						2				4		
2003	16	10	4				4	1						
2003	17	2												
2003	17	4	2				2	2			2	3		
2003	17	7	4			2	3	3				2		
2003	17	10	3			1	4	1						
2003	18	2												
2003	18	4												
2003	18	7	2											
2003	18	10	3											
2003	19	2		2					1				1	
2003	19	4		1				2	3		1	2	2	
2003	19	7	3				2	3				3	1	
2003	19	10	2				2	1						
2003	20	2												
2003	20	4		2				1				3		
2003	20	7		2	3	2		3						
2003	20	10				1		2						
			73	***96***	***40***	***17***	***113***	***71***	***9***	***0***	***4***	***41***	***4***	
			30	***35***	***20***	***10***	***36***	***37***	***5***	***0***	***3***	***17***	***3***	
			37.5	***43.75***	***25***	***12.5***	***45***	***46.25***	***6.25***	***0***	***3.75***	***21.25***	***3.75***	***1***
			2.433333	***2.74286***	***2***	***1.7***	***3.1388889***	***1.9189189***	***1.8***	***#DIV/0!***	***1.333333***	***2.41176***	***1.33333***	
			0.9125	***1.2***	***0.5***	***0.2125***	***1.4125***	***0.8875***	***0.1125***	***#DIV/0!***	***0.05***	***0.5125***	***0.05***	***0.***
1995 data totals			10	162	33	14	148	54	1	3	2	9	8	
			5	44	20	6	45	31	1	1	2	5	4	
			6.25	55	25	7.5	56.25	38.75	1.25	1.25	2.5	6.25	5	
			2	3.6818	1.65	2.33333	3.288889	1.741935	1	3	1	1.8	2	#D
			0.125	2.025	0.4125	0.175	1.85	0.675	0.0125	0.0375	0.025	0.1125	0.1	#D

Appendix D | 2007 Hey & Associates Bohner Lake Inlet Bed Load Study

Bohner Lake Inlet Bed Load Study

By:

Hey and Associates, Inc.

And

Aron and Associates

For :

Bohner's Lake Sanitary District No.1

August 2007

Project No: 06117

BOHNER LAKE INLET BED LOAD STUDY

INTRODUCTION

The Bohner's Sanitary District No. 1 has had a long concern about sediment building up in the inlet to an unnamed tributary that enters Bohner Lake from the Southwest (Figure 1). The Bohner's Lake Sanitary District has installed a sediment trap on the inlet to the lake to collect sediment before it enters the waterbody. The purpose of the sedimentation basin is outlined in a study titled *Bohners Lake Inlet Watershed Study* prepared by R. A. Smith and Associates, Inc. in 1993. The sediment trap was designed to have a design life of six or more years. The sediment trap and the inlet to the lake were dredged in 2002. 1,800 cubic yards of sediment were removed to create the sediment trap and 800 cubic yards of material were removed from the lake inlet. Within 18 months the sediment trap and inlet channel filled with organic sediment and are now in need of maintenance dredging.

During a field reconnaissance in the spring of 2005 to identify potential sources of sediment that caused the rapid filling in of the lake inlet, staff of Hey and Associates, Inc, and Aron and Associates observed large quantities of bed load material of peat moving downstream from a series of agricultural ditches to the south of the lake. The bed load material had a similar characteristic to the material that filled the dredged areas.

The purpose of the following project is to document the source and quantity of sediment that is entering the inlet area and estimate the typical life expediency of the sediment trap.

The following study will attempt to answer the following questions:

1. What is the characteristics and potential source of the bed load material being transported by the tributary stream?
2. What is the potential annual loading of the bed load material to the lake?
3. What is the characteristics and loading of suspended sediment that is being transported by the tributary?



Figure 1

Location of Unnamed Southwest Tributary to Bohner Lake

BOHNER LAKE WATERSHED

Bohner Lake is 135 acre lake located in Southwest Racine County. The lake's total watershed has been estimated to be 1,958 acres, of which 578 acres enters through an unnamed tributary from the Southwest (R. A. Smith and Associates, Inc.,1993). The remaining portions of the watershed drain to the lake predominately through sheet flow from riparian areas of the lake. The headwater of the tributary is at Dyer Lake. The tributary land use is summarized in Table 1.

Table 1

Land Use in Inlet Tributary to Bohner Lake

Land Use	Acres	Percent
Residential	96.3	17
Woodland	186.4	32
Wetland	170.0	29
Agricultural	125.8	22
Total	578.5	100

Source: R. A. Smith and Associates, Inc.,1993

The soils in the tributary watershed are made up of Casco Loam, Fox Loam, and Houghton Muck.

THE SEDIMENT TRANSPORT PROCESS

Soil erosion by water is the process where material is dislodged from the surface of the land and transported by water to a receiving body such as a stream. Once material is detached it can be transported by the energy of the water. As particle size and weight of the material increases, so too does the velocity needed to transport it. The material transported through the stream is it's stream load. Stream load is composed of dissolved or solution load, suspended load, and bed load.

Dissolved load comes primarily from groundwater seepage into the stream. Ions in solution also come from the solution of materials that line the channel. The most common chemical constituents of dissolved solids are calcium, phosphates, nitrates, sodium, potassium and chloride, which are found in nutrient runoff, general stormwater runoff and runoff from road de-icing salts. The chemicals may be cations, anions, molecules or agglomerations on the order of 1000 or fewer molecules, so long as a soluble micro-granule is formed. The technical definition of dissolved solids is that the solids must be small enough to survive filtration through a sieve size of two micrometers (um).

Suspended load is comprised of sediment suspended in the water and transported through the stream. Turbulent flow suspends clay and silt in the stream. Suspended load comes from material eroded from the surface bordering the channel and deposited in the stream, as well as, erosion of the channel itself.

Bed load, sometimes referred to as traction load, is the material that is transported by sliding, rolling, and saltating (skipping) along the bed of a stream (Figure 2) . Particles comprising bed load can range in size from sand to boulders. The movement of bed load is responsible for bedforms that change in time and space along a stream bed.

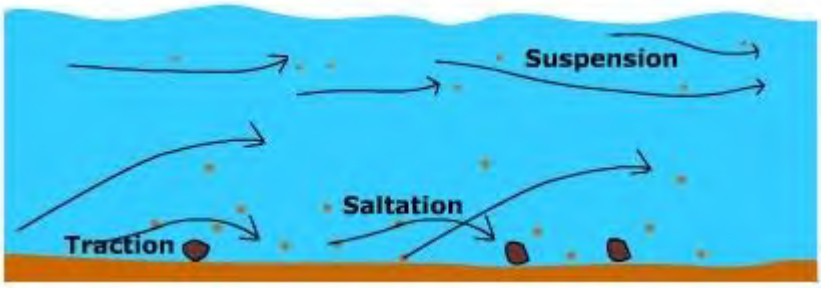


Figure 2
Illustration of Suspended and Bed Load in a Flowing Stream

Particles along a stream bed begin to move when the shear stress exerted by the flowing water exceeds a critical value. The critical shear stress depends on a combination of the particle diameter, the slope of the stream channel, the difference between the density of individual particles and that of water (particle buoyancy), and the degree to which the particles are packed together. As a result, particles of different mineralogical composition and size will have different critical shear stresses. Heavy minerals can be concentrated in stream beds because they are left behind while lighter particles move around them. Likewise, small particles may move while large particles of the same mineral or rock type are left in place. Water density is proportional to the suspended load being carried. Muddy water high in suspended sediment will therefore increase the particle buoyancy and thereby reduce the critical shear stress required to move particles of a given size and composition.

The shear stress exerted by the flowing water, which is proportional to both water depth and stream channel slope, also controls the movement of bed load. Large or heavy particles that have high critical shear stress values may move as bed load when the water is unusually deep during infrequent floods and remain stationary between those times.

Once a particle begins to move, the current above the bed may be strong enough to lift it off the bed and into the flowing water. When the entire weight of a particle is borne by water instead of other particles beneath it, that particle ceases to be part of the bed load and becomes part of the suspended load. Conversely, if the current slows a particle may fall out of suspension and become part of the bed load. The distinction between bed load and suspended load in a stream can therefore change continuously through time.

METHODS

The Bohner Lake Inlet study was broken into four elements:

- Measurement of stream bed load mass
- Measurement of bed load material characteristics
- Measurement of total suspended solids in water column
- Measurement of stream flow

The following section will outline the field and laboratory methods used to acquire the field data used in this analysis.

Bed Load Mass

Bed load mass was measured using a device called a “Helley-Smith Sampler”. The Helley-Smith sampler was designed by the United States Geological Survey (USGS) to conduct stream bedload studies. By design, the Helley-Smith sampler it is intended to collect sediment particles that are moving along the bottom, or close to the bottom, by rolling, sliding, or bouncing (actually, those particles moving within 0.25 ft. of the bed). The device consists of a 3 by 3-inch rectangular funnel fitted with a catch bag made of 0.25 mm opening nylon mesh that is attached to the flared end of the sampler (Figure 3). It is placed on the

channel bottom for a fixed time period and the amount of sediment collected in the bag is then measured.



Figure 3
Photograph of "Helley-Smith" Stream Bead Load Sampler

Bed load samples were collected on seven dates at Fishman Road, located just upstream of the sedimentation basin (Figure 4). Samples were collected at the outlet of a 48-inch corrugated metal culvert that drained under the roadway. Typically with bed load sampling several samples are collected across the stream channel using the "equal width increment method" developed by Edwards and Glysson (1988). In this situation since the water was concentrated by the culvert into a narrow section, collection of multiple samples across the cross-section were not possible or necessary. Samples were collected by placing the Helley-Smith sampler on the bed of the outlet of the culvert. Bed load material was then collected for 60-seconds. Material collected in the mesh bag was then transferred into clean glass jars, stored on ice, and shipped to the Wisconsin Laboratory of Hygiene for analysis. At the laboratory total wet mass of material collected was weighted using an analytical balance.

Particle Size Analysis

To determine the characteristics of the bed load material a particle size analysis was conducted on the bed load material collected by the Helley-Smith sampler. The distribution of particle sizes larger than 63 um (retained on the No. 200 sieve) was determined by sieving. The total mass retained on each sieve was measured to determine the percent of the sample larger than the sieve opening. The distribution of particle sizes smaller than 63 um was determined by a sedimentation process, using a hydrometer. A hydrometer is an instrument used for determining the specific gravity of liquids. Table 2 summarizes the particle size class names, particle size in millimeters and sieves used to classify sediments using particle size analysis.

Table 2
Classification of Particles Used in Particle Size Analysis

Class name	Particle size	Sieve Size
Gravel	>2mm	No. 10
Very Coarse Sand	0.85 - 2.0mm	No. 20
Coarse Sand	0.425 – 0.85mm	No. 40
Medium Sand	0.25 - 0.425mm	No. 60
Fine Sand	0.18 - 0.25mm	No. 80
Very Fine Sand	0.15 - 0.18mm	No. 100
Coarse Silt	0.063 - 0.15mm	No. 200
Medium and Fine Silt	0.002 - 0.063mm	(analysis by hydrometer)
Clay	<0.002mm	(analysis by hydrometer)

Percent Organic Matter

To help determine the potential source of the bed material two test were run to determine if the material was organic in nature, such as peat, or was inorganic and made up of soil particles such as silt, sand or clay. The first test was “total residue”, also referred to by some as “total solids”. Total residue is the measurement of weight of all the bed load material after it has been dried at 103 to 105^{o}C to drive off all of the water in the material. The second test is “non-volatile residue”. Non-volatile residue is a measurement of the

mass of material that is left behind after the sample is ignited at 550°C in a muffle furnace to drive off any of the organic material present. If we subtract non-volatile residue from total residue we get “volatile residue”, which is the measurement of the organic matter in the sample.



Figure 4
Sampling Location of Unnamed Tributary at Fishman Road

Total Suspended Solids in Water Column

Total suspended solids (TSS) are a measurement of the suspended sediment in the water column. TSS of a water sample is determined by pouring a carefully measured volume of water through a pre-weighed glass-fiber filter of a specified pore size, then weighing the filter again after drying to remove all water. The gain in weight is a dry weight measure of the particulates present in the water sample expressed in milligrams per liter or mg/l. TSS samples were collected on six dates by collecting water from the middle of the water column at the outlet of the culvert at Fishman Road. A one liter sample was collected on each sample date, iced, and forwarded to the Wisconsin Laboratory of Hygiene for analysis.

Instantaneous Stream Flow

Instantaneous stream flow was measured on each sampling date by measuring the depth of water flowing in the 48-inch corrugated metal culvert under Fishman Road. In August 2006 the culvert was surveyed to measure the elevation of the inlet and outlet, slope and length of the pipe. Using the Manning's equation, where:

Where:

$$Q = VA = \left(\frac{1.49}{n}\right) AR^{\frac{2}{3}} \sqrt{S} \quad [U.S.]$$

$$Q = VA = \left(\frac{1.00}{n}\right) AR^{\frac{2}{3}} \sqrt{S} \quad [SI]$$

Q = Flow Rate, (ft^3/s)
v = Velocity, (ft/s)
A = Flow Area, (ft^2)
n = Manning's Roughness Coefficient
R = Hydraulic Radius, (ft)
S = Channel Slope, (ft/ft)

the flow in cubic feet per second (ft^3/s or cfs) was calculated.

Annual Flow Record

The annual flow record for the study tributary was estimated using daily stream flow data from available data from the closest USGS stream gauge with similar watershed characteristics. The closest USGS stream gauge to Bohner Lake is the Mukwonago River at Mukwonago. Daily mean flow data for the period of October 1, 2005 through September 30, 2006 was used for the analysis. Daily values measured at the Mukwonago River were linearly transferred by unit drainage area to develop an annual hydrograph for the study tributary.

RESULTS

Annual Flow Record

Using data from the USGS stream gauge at the Mukwonago River at Mukwonago the annual flow hydrograph for the study tributary was developed and is illustrated in Figure 5. For the water period of October 1, 2005 through September 30, 2006 it is estimated that 429-acre-feet (140 million gallons) (8.913-inches) of water entered Bohner Lake from the study tributary.

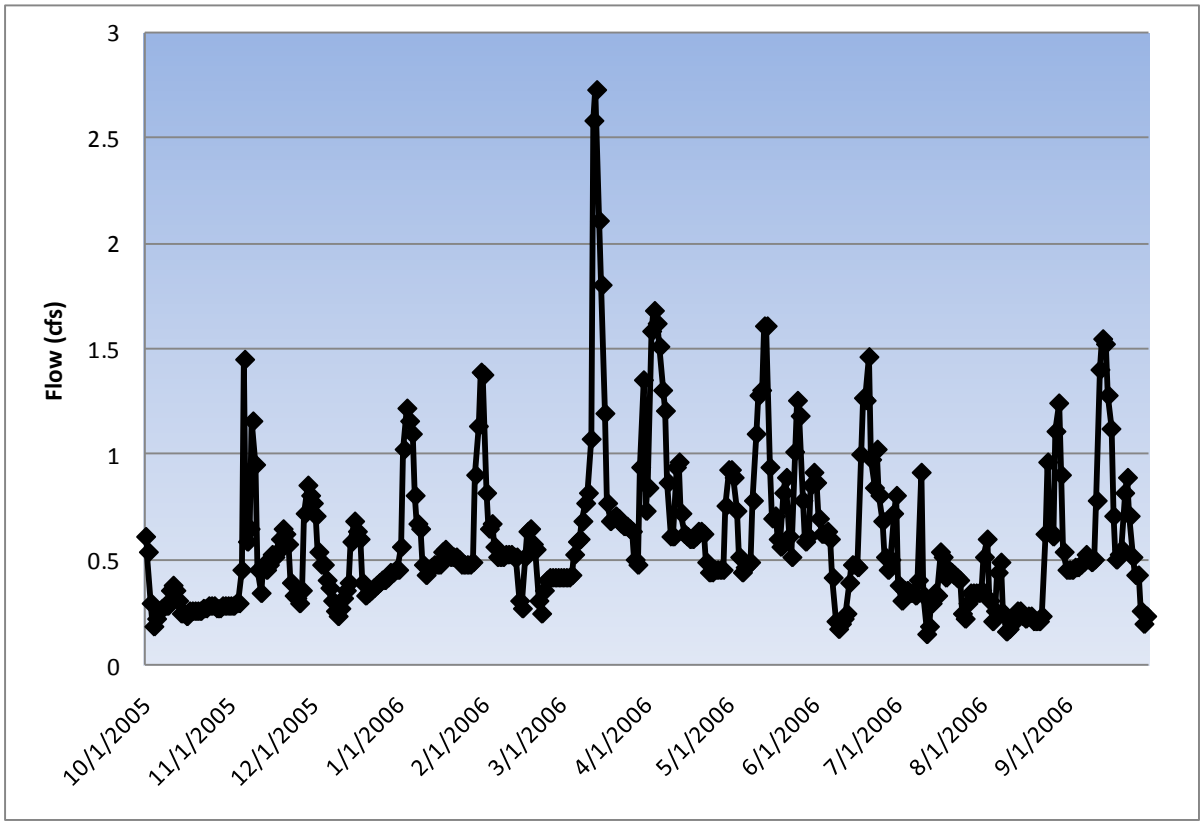


Figure 5

Estimated Annual Flow Hydrograph for Study Tributary

Characteristics of Bed Load Material

To determine the characteristics of the bed load material entering Bohner Lake the material collected by the Helley-Smith sampler was analyzed for percent organic matter and particle size distribution. Percent organic matter was calculated by measuring the total residue and total volatile residue. The total volatile residue represents the fraction of the sample that is organic matter. Table 3 summarizes the results of the two samples for organic matter in the bed load material. The results show that more than 77 percent of the bed load material is organic in nature.

Table 3

Results of Total and Volatile Residue Sampling of Bed Load Material

Date	Total Residue (mg/l)	Total Volatile Residue (mg/l)	Percent Organic Matter (%)
5/15/2006	9400	7400	78.72
6/18/2006	3010	2320	77.08

Figure 6 illustrates the particle size analysis run on the bed load sample collected on May 15, 2006. From the distribution we see that 70 percent of the sample is made up of particles greater than 500 um (0.5mm) in size, 25 percent is sand (125 to 500 um), 4.4 percent is silt (5 to 125 um) and 0.1 percent is clay (< 2um).

The high percent of large particles (>500 um) combined with the high percentage of organic matter in the samples confirms the original hypothesis that the material moving as bed load down the study tributary is likely peat in nature. The likely source is erosion of the Houghton Muck soils located in the valley floor of the drainage area which are peat in nature. Much of the Houghton soils have been historically used as muck farms to grow cash crops.

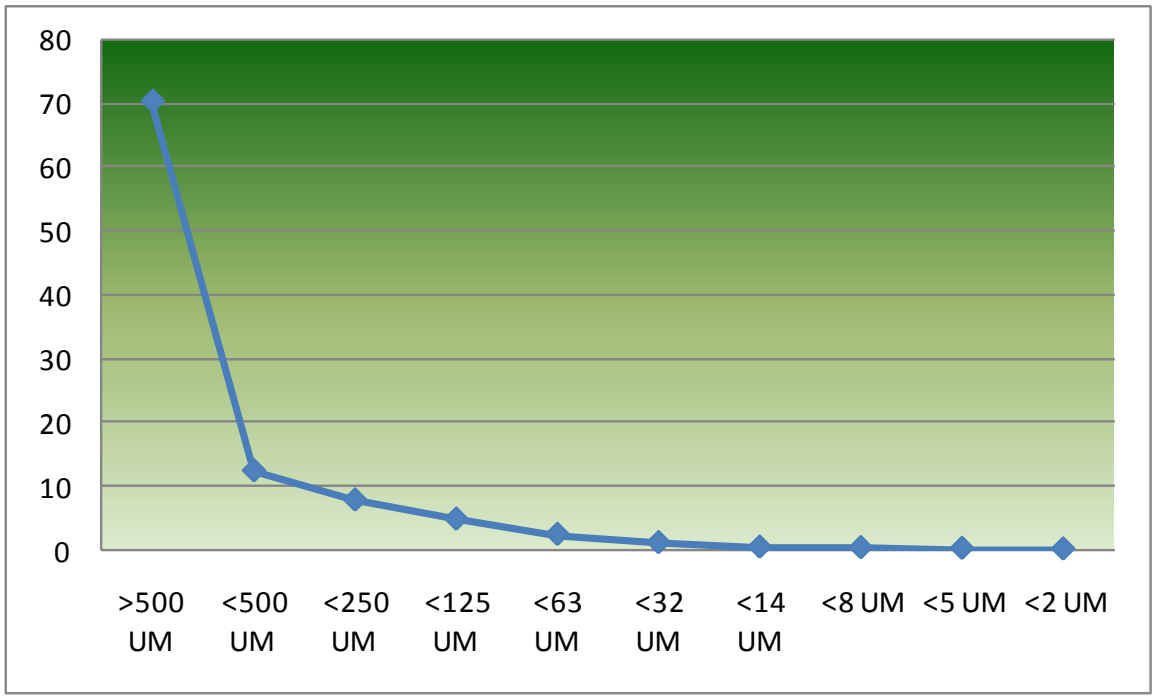


Figure 6

Particle Size Distribution for Bed Load Sample on May 15, 2006

Bed Load Mass and Annual Loading

The results of the total mass measurements for the bed load sampling for seven sample dates is summarized in Table 4. The total mass of wet material collected during the one minute sampling with the Helley-Smith sampler ranged from 763 to 1,834 grams (1.68 to 4.04 pounds). The water depths measured on the sampling dates, along with calculated flows, velocities and specific energy are summarized in Table 5. To determine if there is a relationship between bed load and stream flow, a plot of bed load mass per minute versus stream flow was prepared (Figure 7).

Table 4

Results of Bed Load Sampling

Date	Total Mass Bed Load (grams/min)	Total Mass Bed Load (pounds/min)
5/15/2006	1,834	4.04
6/18/2006	845	1.86
2/22/2006	835	1.84
6/24/2006	763	1.68
8/24/2006	802	1.77
10/3/2006	844	1.86
10/4/2006	856	1.89
Mean	968	2.14
Geometric Mean	923	2.04
Standard Deviation	383	0.84

Table 5

Water Depth and Flow Calculations for Sample Dates

Date	Water Depth (inches)	Flow (cfs)	Velocity (fps)	Specific Energy (ft)
5/15/2006	6.00	2.32	2.56	0.60
6/18/2006	4.50	1.27	2.13	0.45
2/22/2006	3.25	0.64	1.73	0.32
6/24/2006	3.50	0.75	1.82	0.34
8/24/2006	7.25	4.43	2.87	0.73
10/3/2006	9.50	5.97	3.38	0.97
10/4/2006	5.50	1.93	2.42	0.55
Mean	5.64	2.47	2.42	0.57
Geometric Mean	5.29	1.84	2.36	0.53
Standard Deviation	2.21	2.01	0.59	0.23

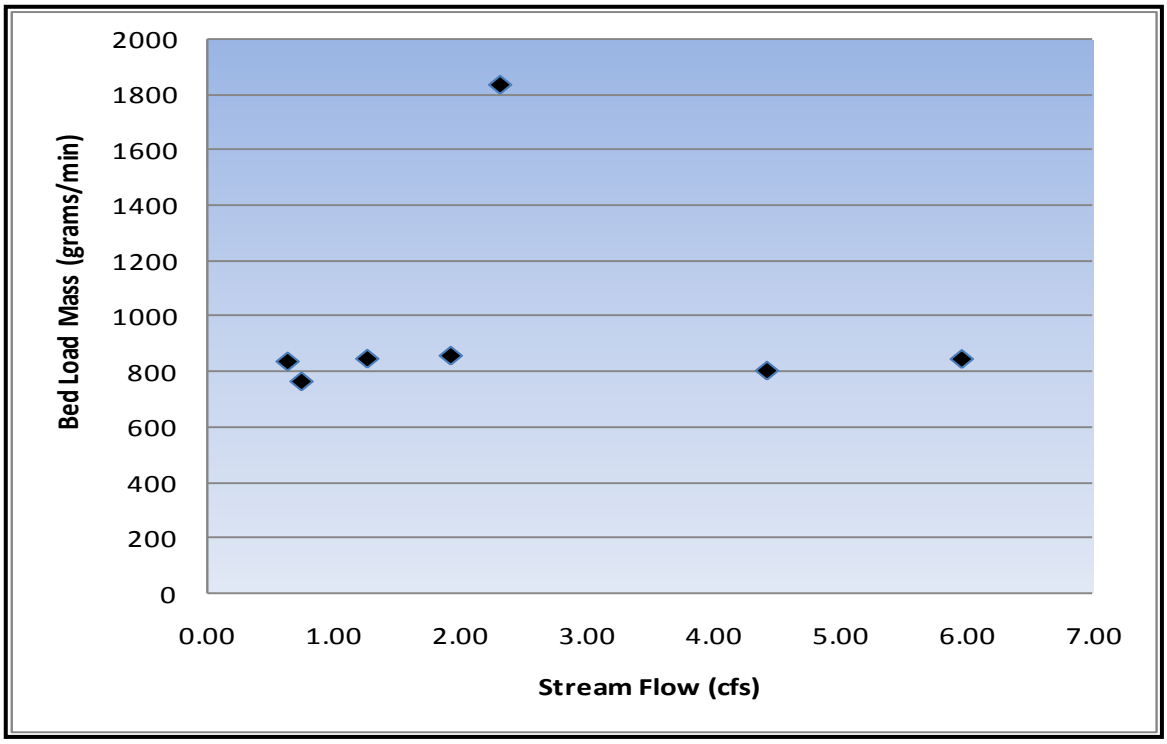


Figure 7
Bed Load Mass per Unit Time versus Stream Flow

As we see in Figure 7, based on the available samples, there is no relationship between stream flow and mass of bed load being carried by the tributary. Most values lie around a mean of 824 grams per minute. The one value of 1,834 grams per minute on May 15, 2006 is over two standard deviations from the mean value. When we average all of the values to calculate a mean we give equal weight to each value. In this case one outlier can dramatically influence the mean. In these situations it is better to use the geometric mean, which is the average of the logarithmic values of a data set, converted back to a base 10 number. The geometric mean puts less weight on the outlier values. For calculation of annual loading of bed load material the geometric mean value will be used.

The loading of material entering a water body is the measurement of mass or volume over a given time period. Figure 5 illustrates that generally bed load is uniform on most dates and is independent of stream flow. Therefore, the annual mass loading of bed load material can be calculated by multiplying the geometric mean of mass per unit time by the time in one year:

Total Load = 2.036 (lbs/min) * 525,600 (min/year) = **1,070,121.6 (lbs/year)**

We can convert this mass load in pounds to a volume by using literature values of weight per volume (density). The SIMetric.co.uk webpage provides density data for a variety of bulk materials including wet peat. Wet peat has a bulk density of 3232.5 pounds per cubic yard (1121 kg/m^3). Based on this wet peat density we have the following volume of bed load material moving down the study tributary:

Total Wet Volume Bed Load = 1,070,121.6 (lbs/year) / 3232.5 (lbs/cu-yd) = **331.05 (cu-yds)**

As material enters the sedimentation basin and lake it will begin to settle under the force of gravity. As sediment moves through the water column towards the bottom it traps water between the particles resulting in a mass that is partially solids and partially water. R. A. Smith and Associates in their work in 1992 measured the solid/water content of the material in the sedimentation basin and lake and found the material to be approximately 18 percent solids and 82 percent water. If we add the water to the wet solids measured entering the lake we get the following total volume of material settling in the lake inlet area:

Total Wet Volume Sediment = 331.05 (cu-yds) / 0.18 = **1,839 cu-yds**

We see that the total volume of estimated annual bed load input from the tributary is approximately equal to the volume of material originally dredged in 2002.

Total Suspended Solids

Total suspended solids (TSS) is a measurement of the suspended sediment in the water column. On six dates TSS samples were collected at the culvert at Fishman Road. The results of the sampling and calculated instantaneous loading of material in pounds per day are presented in Table 6. The results show a range of TSS concentrations ranging from 14 mg/l to 260 mg/l. TSS concentrations above 40 mg/l cause cloudy water conditions and levels above 100 mg/l can damage aquatic life.

To determine if there was a relationship between flow rate and TSS concentration, the two parameters were plotted and the results are illustrated in Figure 8. The results, similar to base load, do not show a good relationship between flow rate and TSS concentration based on the limited sampling.

Table 6

Results of Total Suspended Solids Sampling

Date	Flow (cfs)	TSS (mg/l)	Loading (lbs/day)
5/15/2006	2.32	-	-
6/18/2006	1.27	77	526.86
2/22/2006	0.64	260	896.50
6/24/2006	0.75	194	783.90
8/24/2006	4.43	37	883.09
10/3/2006	5.97	155	4985.45
10/4/2006	1.93	14	145.57
Mean	2.50	122.83	1370.23
GEOMEAN	1.77	82.35	786.83
STDEV	2.20	96.15	1793.68

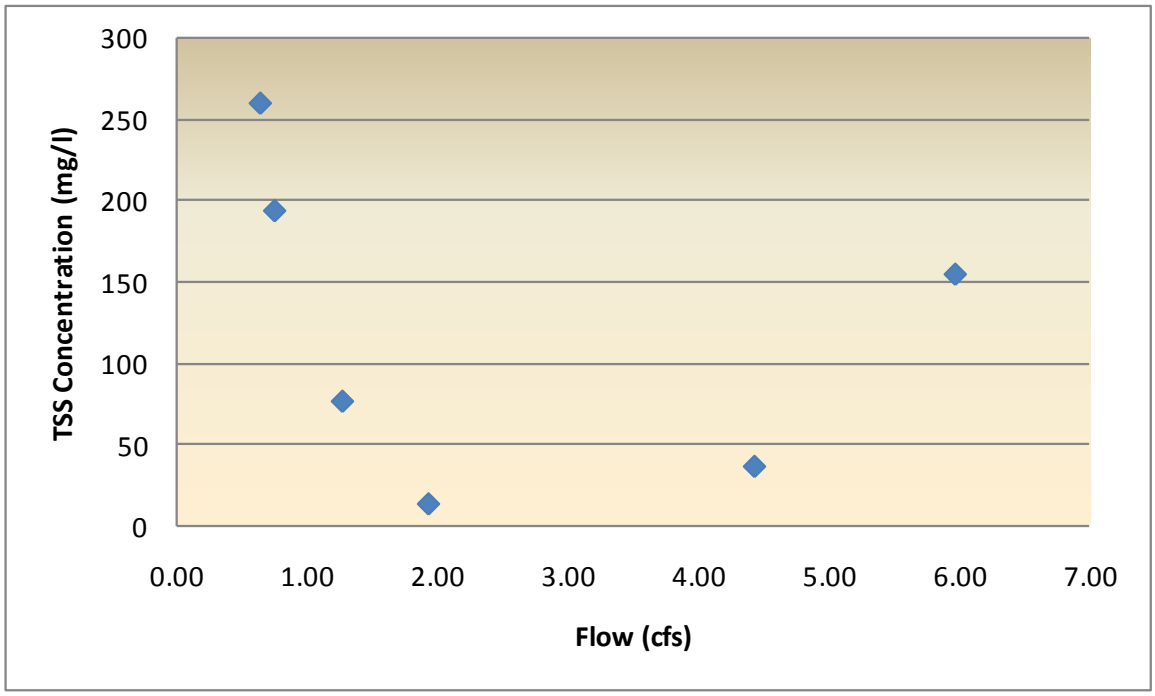


Figure 8

Total Suspended Solids Concentration versus Flow Rate

To see if there was a seasonal relationship of TSS concentration that may be related to cropping practices and degree of vegetative cover, TSS concentrations were plotted by date (Figure 9). From the limited sampling we do not see any good seasonal relationships.

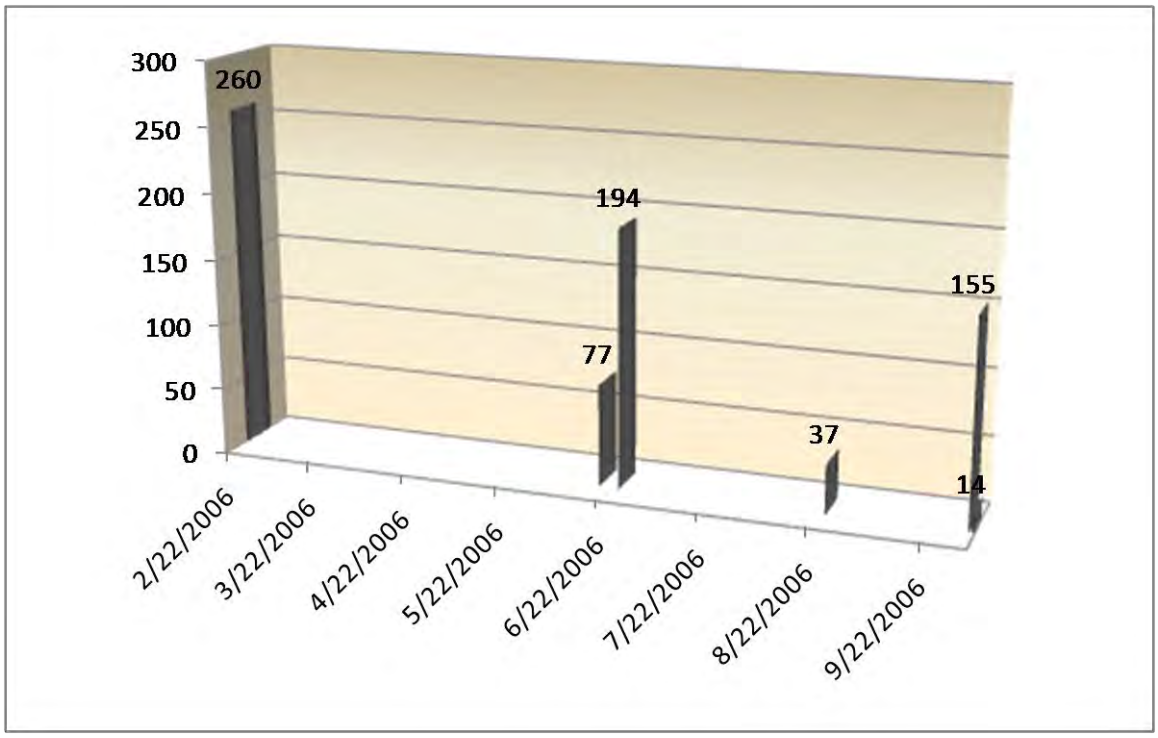


Figure 9

Total Suspended Solid Concentrations by Date

TSS concentrations can be highly variable and are influenced by vegetative cover, soil moisture, and rain intensity. The limited data does not all the calculation of annual loads to the sedimentation basin or lake. Due to the fine nature of suspended solids, most likely move through the sedimentation basin and lake inlet and deposit in the open water areas of the lake.

CONCLUSIONS

Based on the available sampling in 2006 it is estimated that the Southwest tributary to Bohner Lake inputs approximately 1,839 cubic yards of bed load material to the lake inlet on an annual basis. The bed load material is over 77 percent organic in nature and has more than 70 percent of its particles larger than 500 um, indicating that the material is likely peat that is being eroded off of areas of Houghton Muck soils. The rapid filling in of the

sedimentation basin upstream of the lake and the lake inlet following dredging in 2002 is likely due to the high amount of bed load material that is moving along the tributary bed.

The rate of material movement appears to be relatively uniform from sample date to sample date and is not related to flow rates. The tributary channel carries a relatively uniform base flow, feed by springs in the glacial valley. A likely source of the bed load material is erosion of the banks of the agricultural ditches that were installed to facilitate farming of the wetland valley between Dyer Lake and Bohner Lake. To determine the exact locations of the soil erosion would require a field survey of the drainage ditches.

RECOMMENDATIONS FOR FUTURE ACTION

Prior to re-dredging of the sediment basin and lake inlet, a survey should be conducted on the drainage system in the Southwest tributary to determine if the sources of the bed load material can be controlled. The survey should begin with a field reconnaissance to see if oblivious sources of the erosion can be identified. Due to the wet nature of the soil and many riparian wetlands along the drainage system the reconnaissance would best be conducted in the winter on frozen ground. Based on the reconnaissance survey a strategy for the development of a management plan should be put together. Based on the above work, dredging of the sedimentation basin and lake inlet without some control of the source material will result in the need to re-dredge on an annual or bi-annual basis.

REFERENCES

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American Society for Testing and Materials (1985). *Standard Method for Particle-Size Analysis of Soils*, ASTM D422-63, , Philadelphia, Pa., .

Appendix E | 2022 Heartland Vegetation Management Proposal

Heartland
ECOLOGICAL GROUP INC
506 Springdale Street, Mount Horeb, WI 53572

August 16, 2022

Mr. Harvey Kandler
Bohner's Lake Sanitary District
harveykandler@yahoo.com

RE: Proposal for Professional Ecological Restoration Services – Baumeister Wetland Mitigation Bank, Town of Burlington, Racine County, Wisconsin

Dear Harvey:

Heartland Ecological Group, Inc. (Heartland) is pleased to present this proposal to Bohner's Lake Sanitary District (BLSD, the "Client") for vegetation management services at the 45.71-acre Baumeister Wetland Mitigation Site (the "Site"). The Site is located approximately ¼ mile northeast of the intersection of County Trunk Highway (CTH) P / McHenry Street and Warren Road, in the northwest ¼ of Section 19, T2N, R19E, Town of Burlington, Dane County, Wisconsin (Attachment 1, Project Location Map). This proposal includes the scope of services, cost estimate, assumptions, project schedule, extra services, and terms and conditions. Heartland will initiate this project upon receipt of an executed Agreement.

Heartland understands that the Site was established in 2006 by the Wisconsin Department of Transportation (WisDOT) to achieve permittee-responsible compensatory wetland mitigation requirements. The Site owner is required to comply with the Amended Restrictive Covenants (dated August 7, 2012) which includes maintaining the property in a natural state, based on inventory completed by Heartland in September 2020 documented in the "Vegetation Survey and Summary" report dated December 14, 2020.

Maintenance of natural areas is primarily done through vegetation management, specifically through management of weedy native and non-native & invasive (NNI) species that have the potential to displace desirable native vegetation in restored areas. Based on Heartland's understanding of the extent of seeding, planting, and management completed for the WisDOT mitigation project, the vegetation management activities will take place in the following restored plant communities:

- Deep Marsh: approximately 6 acres with predominantly native vegetation composition and cover. Narrow-leaf Cattail (*Typha angustifolia*) is the primary target.
- Shallow Marsh: approximately 6 acres with predominantly native vegetation composition and cover. Narrow-leaf Cattail and Reed Canary Grass (*Phalaris arundinacea*) are primary targets.
- Wet Meadow: approximately 21.75 acres that ranges from areas with predominantly native vegetation composition and cover to areas with moderate coverage of NNI. Box Elder (*Acer negundo*), Giant Ragweed (*Ambrosia trifida*), Stinging Nettle (*Urtica dioica*), Narrow-leaf Cattail, and Reed Canary Grass are primary targets.
- Tallgrass Prairie: approximately 5 acres that is dominated by weedy native and NNI species. Burdock (Arctium minus) and Giant Ragweed are primary targets. In

addition, an approximately 1.18-acre portion was re-seeded in 2019 and was dominated by annual and biennial species as of September 2020.

Heartland's "Proposed Management Plan," dated February 23, 2021, provided a summary of approaches for vegetation managed, as follows:

- Spot spray herbicide treatments,
- Boom spray herbicide treatments,
- Maintenance mowing, and
- Prescribed burning.

Heartland will utilize these techniques to manage vegetation starting in spring 2023 and extending through the 2025 growing season. The overall approach and level of effort outlined in the Scope of Services below is consistent with a hybrid approach between Option 2: Intermediate Approach and Option 3: Targeted Approach as outlined by Heartland in the "Proposed Management Plan."

Scope of Services

Heartland has prepared a Scope of Services that we feel is sufficient to satisfy the Amended Restrictive Covenants. The Scope of Services follows a hybrid between Option 2: Intermediate and Option 3: Targeted which focus the management efforts on the most robust populations of weedy native and NNI species; as such, some portions of the Site may not be treated within a single visit or for extended stretches in the 2023-2025 management timeframe

Task 1. Herbicide Applications

Heartland will assist with obtaining a Chapter NR107 Aquatic Plant Control permit and Wisconsin Pollution Discharge Elimination System (WPDES) Aquatic Pesticides general permit for use of herbicides in aquatic areas, including wetlands. Heartland will obtain the permit on behalf of the Client.

Herbicide applications will consist of spot spray and boom spray techniques to manage weedy native and NNI species. Once on-Site, the use and extent of each technique will be based on the size and density of target species populations, presence of desirable native vegetation, accessibility, and Heartland's experience working in similar settings.

Spot Spray

Heartland anticipates using spot spray herbicide treatments in plant communities that were described in "Fair" condition in the Vegetation Survey and Summary. This includes:

- Deep Marsh (assume 6 acres),
- Shallow Marsh (assume 6 acres), and
- A large portion of the Wet Meadow (assume 14.5 acres).

Together, these comprise a total of approximately 26.5 acres.

Spot spraying utilizes a backpack sprayer to apply a low volume of herbicide to individual target plants in a highly targeted manner. A Heartland spot spray crew will meander on foot through each of the above plant communities to treat small clumps of weedy native and NNI. This goal is to minimize spread of target species and minimize collateral damage to desirable species. Heartland proposes the following frequency, timing, and level of effort:

- 2023-2025: two spot spray herbicide treatments per year to treat priority species, completed by a crew of 3 field staff working for 2 days per event.

Boom Spray

Heartland anticipates using boom spray herbicide treatments in plant communities that were described in "Poor" condition in the Vegetation Survey and Summary. This includes:

- Portion of the Wet Meadow (assume 7.25 acres) where Reed Canary Grass is prevalent.
- Southwest to Northeast Stream Corridor (assume a 50-foot average width, or about 2 acres total) where Reed Canary Grass is dominant.
- South Property Edge (assume a 75-foot setback from the property line, or about 2.5 acres total) to target Giant Ragweed and Stinging Nettle.
- Portion of the Tallgrass Prairie where broadleaf species such as Giant Ragweed and Giant Burdock are prevalent (assume 2 acres).

Together, these comprise a total of approximately 13.75 acres.

Boom spraying utilizes a boom sprayer or pistol sprayer mounted to an ATV or UTV to apply a higher volume of herbicides. A Heartland operator will drive through the above plant communities to target larger populations of weedy native and NNI, such as expansive patches or the periphery of large monocultures. The goal is to minimize spread of target species to adjacent areas. Heartland proposes the following frequency, timing, and level of effort:

- 2023-2025: two boom spray herbicide treatments per year to target select large areas of weedy native and NNI, completed by 1 operator working for 2 days per event.

Boom spray applications will be completed concurrently with spot spray herbicide treatments. The boom spray operator will work in coordination with spot spray crews to develop and execute daily work plans.

As the goal is to maintain the vegetation conditions as they were in September 2020, not all target vegetation will be treated during each visit. Heartland field staff will use their judgment to work through the Site and manage target vegetation following the level of effort allowances stated above for spot spraying and boom spraying.

Heartland will select herbicides base on application environment (aquatic vs. terrestrial), target species, and application timing. Herbicides will be applied by certified and licensed commercial applicators. A work report and herbicide application report will be completed at the end of each workday.

Task 2. Maintenance Mowing

Heartland will utilize mowing to target select annual and biennial weedy native and NNI species. Select perennial species may also be mowed to minimize seed formation and/or to facilitate follow-up management using herbicides.

Heartland anticipates that mowing will be done in the following areas:

- The Tallgrass Prairie, especially the area that was recently seeded in 2019 (assume 2 acres).
- The South Property Edge (assume a 75-foot setback from the property line, or about 2.5 acres total) as an additional tool to assist with management of Giant Ragweed and Stinging Nettle to minimize encroachment on the adjoining property.
- Areas where new growth of weedy or NNI woody species (seedlings and saplings) are observed (assume up to 3 acres).

Heartland will mobilize one mower and operator up to 2 days each growing season from 2023-2025 to target priority species.

Task 3. Prescribed Burn

Heartland will perform a prescribed burn of the Site to assist with vegetation management. Prescribed burning is a highly effective tool to facilitate NNI management and to promote natural processes that favor desirable native species. As practicable, the burn will be timed with the pending stream restoration work to assist with removal of standing vegetation.

Heartland will prepare a Site-specific burn plan with the following components:

- Listing of contacts associated with the burn planning, internal and external approvals, and burn execution.
- Reference to any required regulatory permits (issuing agency, permit number, and expiration date) in addition to procurement of permits on the Client's behalf.
- Site-specific information including location description and summary of Site conditions.
- Burn-specific requirements, such as regulatory (permit) conditions and/or other approvals, Site-specific safety; burn resources (staff, equipment, PPE, signage); pre- and post-burn notifications list; burn execution; acceptable weather parameters; burn objective; plans pertaining to hazard management, communications, ignition (firing plan), holding, and extinguishment techniques, lookout, contingencies, emergency response, and smoke management; air quality parameters; and smoke

management plan with reference to the Wisconsin Smoke Management Best Management Practices for Prescribed Burns (SMBMP).

- An overview map depicting the Site relative to surrounding areas.
- A close-up view of Site overlain on a recent aerial photograph. This will include proposed burn unit(s), fire breaks, Site hazards, safety zones / muster point, adjacent smoke sensitive areas, water sources, and contiguous / potentially receptive fuels.
- A map with the route to the nearest emergency room or urgent care facility from the Project area.
- Reference to local ordinance, fire prevention and safety codes, etc.
- Technical review by the designated Heartland Burn Boss.

Heartland will then conduct the burn when Site and weather parameters, per the burn prescription, are conducive to safely conduct a burn and meet the burn objectives. The target burn window is 2023. Burn services will consist of the following:

- Install burn breaks as required by the Site-specific burn plan.
- Pre- and post-burn notifications to persons and agencies listed on the Site burn plan.
- Placement of "Prescribed Burn Ahead" signs on adjacent roads to alert people in the area.
- A burn crew along with supplies, tools, and equipment to complete the burn. The burn will consist of ignition, containment, and extinguishment.

Task 4. Annual Reporting

Heartland will track all management activities and prepare an annual memorandum summarizing the following:

- Vegetation management activities:
  - Herbicide applications: target species, application dates, herbicides, and results.
  - Maintenance mowing: target species and mowing dates.
  - Prescribed burning: post-burn report consisting of burn date(s) and time, burned areas, and burn completeness.
- General Site conditions.
- Adaptive management recommendations.

The annual memorandum will be submitted by January 31st of the year following management.

ASSUMPTIONS

The Scope of Services and cost estimate are based on the following assumptions and exceptions:

- The Project area limits are within the legal boundaries of the Baumeister Wetland Mitigation Bank.
- The Client is responsible for securing safe access onto the property and will inform Heartland of any required notifications prior to entering the property.
- Attendance and coordination of client, project team, and/or regulatory agency meetings are not included unless specified in the Scope of Services.
- All Site meetings with the Client or Client representatives will be done concurrently with on-Site activities while a Heartland crew is on-Site. No additional Site meetings are included in our costs.
- Heartland will perform herbicide applications per product labels and accepted treatment methodologies but provides no guarantee of target species mortality or long-term system response. The effectiveness of each herbicide application is dependent upon several conditions such as target species, weather conditions before and after the herbicide application, available target species seed bank, and target species populations on adjacent parcels and within the watershed. Sustainable control of target weed populations often takes consistent and appropriately timed applications over multiple years. Complete control of any particular target species is not anticipated for this project.
- Public notice for prescribed burning is not required under the Wisconsin Environmental Policy Act (WEPA).
- A burn complexity analysis, or other analyses / modeling pertaining to fire and smoke behavior, will not be needed.
- There are no utility encumbrances or easements that would require additional coordination or specific consideration during execution of the work.
- Additional notifications or media communication beyond those identified in the Site-specific burn plan is excluded.
- Prescribed burns will be completed in accordance with the Site-specific burn plan. Site and weather parameters that Heartland may consider include Site accessibility, fuel types and condition, adjacency to populated areas and structures, antecedent drying days, temperature, wind speed/direction, relative humidity, mixing height, vent rate, and Haines Index.
- The decision to mobilize/demobilize a Heartland burn crew to/from a burn Site will be made by the designated Heartland project manager and Burn Boss. Once at the Site, final go/no-go decisions will be made by the Heartland Burn Boss.

- Prescribed burns will only be ignited under appropriate conditions and prescription limitations; however, Heartland cannot guarantee the effectiveness or completeness of such burns due to conditions outside of our control, including but not limited to fuel types, fuel density and connectivity, standing water or wet soils/thatch, and changing weather conditions.
- All personnel on a burn are to be under the supervision of a Heartland Burn Boss and shall be employed by Heartland unless previously agreed upon with all project stakeholders.
- The "extinguish" standard in the WDNR Prescribed Burn Handbook will be followed.

COST & SCHEDULE

Task 1. Herbicide Applications

- 2023.....$17,900
- 2024.....$18,300
- 2025.....$18,700

Task 2. Maintenance Mowing

- 2023..... $3,900
- 2024..... $4,000
- 2025..... $4,100

Task 3. Prescribed Burning $13,000

Task 4. Annual Reporting..... $1,500

Contract Total: $81,400

- Services will be performed on a time and materials basis not to exceed the annual cost estimates and will be billed per the attached rate table and reimbursable expense schedule. Cost estimates include reimbursable expenses (materials, equipment, mileage) and do not include applicable sales tax for field services.
- If Heartland encounters unanticipated conditions or circumstances that result in exceeding the cost estimate or is requested to provide services that are not in the Scope of Services, Heartland will contact the Client for approval of the Extra Services and additional fees.
- Upon authorization and acceptance of a signed agreement, Heartland will initiate and schedule the project services. Heartland will coordinate the fieldwork and report schedule with you and communicate closely throughout the project so that our services are completed and delivered on-time and as expected.
- Upon written authorization to proceed, the services will be completed under the terms and conditions of the original contract documents and agreements.

Heartland thanks you for providing us the opportunity to offer this Proposal for Professional Services. We look forward to working with you. Please reach out with any questions you may have.

Sincerely,



Aaron Feggestad
Senior Ecologist
Heartland Ecological Group, Inc.
aaron@heartlandecological.com
(608) 354-4976

Attachments:
Authorization Page; Rate Tables

The Scope of Services and Cost Estimates are agreed upon and authorized by signature below by an authorized representative of the Client and Heartland Ecological Group, Inc. The services will be completed under the terms and conditions of the original contract documents and agreements.

Heartland Signature: 

Date: August 16, 2022

Jeff Kraemer, Principal
Heartland Ecological Group, Inc.
506 Springdale Street
Mount Horeb, WI 53572

Client Signature: _____

Date: _____

Client Representative:

_____

Client Entity (if applicable): _____

Client Billing Address: _____

_____

Client Email Address: _____

Client Phone Number: _____

Appendix F | 2023 Heartland Burn Plan, Baumeister Parcel

Heartland
ECOLOGICAL GROUP INC

Master Burn Plan

Owner Information

Project #/Name	**20190224 Lake Bohner**		
Owner	**Bohner's Lake Sanitary District (BLSD)**	**Contact**	**Harvey Kandler**
Phone #	**262-210-9101**	**Email**	**harveykandler@yahoo.com**
Street Address	**P.O. Box 280**		
City/State/Zip	**Burlington, WI 53105**		

Property & Burn Information

Burn Location Address	**8601 McHenry St, Burlington, WI 53105**		
County	**Racine**	**Acres***	**45.71**
Ecotype Present-Fuel type	**Reed Canary, wet meadow/sedge component, and tallgrass prairie- light thin minute fuels throughout.**		
Projected Burn Date Range	**09/15/24 – 10/25/24**	**Actual Burn Date**	

Objectives to be Accomplished

- **Reduce fuel loads**
- **Restore fire as an ecological process within the ecosystems**
- **Reduce competition level of non-native and aggressive native species**
- **Recycle nutrients for promotion of healthy soils**

***See attached map of the area**

Notifications

Agency	Phone #	Email	Notification Period
WIS Burn	1-888-947-2876		**Day of**
Bill Vrchota- Town of Burlington Fire Dept.	(262) 763-3070 Cell: (262) 210-0496	fdchief@townofburlington.com	**Day of**
Racine Co. Sheriff's Department	(262) 886-9465	RCSheriff@racinecounty.com	**Day of**
Harvey Kandler	(262) 210-9101	harveykandler@yahoo.com	**Day of**
Jeff Kraemer	608-575-5783		**Day of**

Permits Needed:

Agency	Date Obtained
Town of Burlington Burn Permit (Contact: 262-763-3070 and office@townofburlington.com)	

Considerations

Firebreak Types and Location

- **Mowed, raked, and blown free of debris and burnable fuels as necessary**
- **In between ecoytpes and property boundaries**
- **Spring Brook Creek located along eastern Property boundary**
- **Spring Brook Creek located along southern Property boundary**
- **Drainage ditch located along western Property boundary**
- **Drainage ditch located along northern Property boundary**
- **McHenry St. in NW corner of Property boundary**

Prescribed Weather Conditions

Temperature (F)	**32˚- 80˚F**	**Relative Humidity (%)**	**25-60%**
Wind Direction	**North/NW**	**Wind Speed (mph)**	**3-20 mph**

Smoke Management

Sensitive Area	**Distance to Area from Burn**	**Direction**
Commercial/Restaurant Facilities	**190ft.**	**North**
Private Residence	**500ft.**	**Southwest**
Private Residences along McHenry St.	**500-875ft.**	**West/NW**

Ignition Plan

1. Sequence of the burn and fire type
2. Use of test fire to determine go/no-go regarding fire and smoke concerns
3. Measures to address smoke and fire concerns to roads and adjoining property owners
4. Slope considerations

On the day of burn, Prescribed Burning signs will be placed along McHenry St. to the NE and SW of the burn unit. As a contingency source of water, (2) trucks with pumps and water tanks will be staged to the south of the unit on adjacent landowner property. Assuming weather prescriptions are met on the day of burn, the burn will commence with the full crew at the Ignition/Test Fire point in the SE corner of the site. A test fire will be lit to ensure smoke is traveling in a prevailing south/southeast direction away from McHenry St. The Burn Boss will take one crew of 3-4 on the west line, while the Line Boss will take a crew of 3-4 on the east line. Crews will light alongside Spring Brook Creek, using the stream channel as a natural burn break to prevent burn escapes on adjoining property to the east and south. The East line shall stay slightly ahead of the west line in order to limit head fires and ensure backing fire has produced sufficient black in the SE portions of the burn unit. An ATV/UTV with portable pumps shall be utilized on the west line to lay wet line along the western burn unit edge where the burn unit abuts agricultural fields and upland woods. The east line will have (2) crew members with backpack pumps to protect from escapes into upland woods on the east and north side of the burn unit. Crews will progress north and utilize flanking fire to build black. Should interior ignition be needed, the burn boss and line boss will direct said activity to the ignitors on the west and east lines. Crews shall meet in the NW corner to ring the unit, establish an anchor point, and send head fire into the unit to complete the burn. Upon successful completion of the burn, both crews shall commence mop-up and ensure no active embers are present on site before departing.

See attached map for Ignition Plan Graphic and Nearest Emergency Facility Map/Route

Equipment

Equipment Available	**Desired on burn?**	**# Available**	**Comments/Considerations**

Drip Torch	☒	4	
Matches/Lighter	☒	2	
Backpack Pump	☒	6	
ATV with Water Supply	☒	2	
Pumper Truck	☒	2	
Portable 2” Pump	☒	1	
Chainsaw w/chaps	☒	2	
Brush Saw/Weed Wacker	☒	2	
Flapper	☒	4	
Rakes	☒	4	
Leaf Blower	☒	1	
First Aid Kit	☒	1	Per vehicle
2-Way Radio	☒	5	
Cell Phone	☒	1	Per individual
Hard Hat	☒	1	Per individual
Leather Gloves	☒	1 pair	Per individual
Eye Protection	☒	1 pair	Per individual
Drinking Water	☒	1 gal. min.	Per individual
Nomex Fire Suit	☒	1	Per individual
Hightop Leather Boots	☒	1 pair	Per individual
Road Signs	☒	4	2 ‘Rx burn ahead’ signs, 2 ‘men working ahead’ signs
Weather Kits	☒	1	Located with Burn Boss

Personnel

Minimum Burn Crew Size to Complete the Burn: 2

Position	Name	Contact Information	Experience/Training
BURN BOSS	Jason Behrends	(815)760-0184 jason@heartlandecological.com	S-130, 190, 290 RX- 301, 341 IL Certified Prescribed Burn Manager
Burn Crew	Wes Ellarson	(715) 570-9847 wes@heartlandecological.com	S-130, 190, 219, 290, 390, L-180
	Keith Phelps	(651) 395-1053 keith@heartlandecological.com	S-130, 131, 190, 211, L-180
	Scott Fuchs	(262) 903-1156 scott@heartlandecological.com	S-130, 190, L-180
	Luke Bignall	(906)281-1700 luke@heartlandecological.com	S-130, 190, L-180
	Matt Stengel	(920)419-5634 matt@heartlandecological.com	S-130, S-190, L-180
	Gabby Pawlak	(779)777-0020 gabby@heartlandecological.com	S-130, S-190, L-180
	Norma Thompson	(815)354-3694 norma@heartlandecological.com	S-130, 190, L-180
	Ron Lutz II	(724)712-9387 ron@heartlandecological.com	S-130, 190, L-180
	Juliana Vollmer	(262)395-5597 Juliana@heartlandecological.com	Heartland Burn Training
	Weiyi Zhao	(608)977-3775 Weiyi@heartlandecological.com	Heartland Burn Training
	Gabby Braun	(608)282-5195	Heartland Burn Training

Heartland
ECOLOGICAL GROUP INC

Master Burn Plan

		gabbyb@heartlandecological.com	

This Prescribed Burn Plan was prepared by:	
Name: Keith Phelps	Date: 07/31/2023

Date of Burn: _____ Time of Burn: _____

- ☐ All burn personnel are on site
- ☐ All personnel have appropriate safety gear
- ☐ All personnel have been briefed and aware of their assignments and the burn unit
- ☐ All personnel are aware of the objectives, ignition plan, extra resources, escape routes, and safety zones
- ☐ All necessary permits and approvals have been obtained
- ☐ All pre-burn contacts have been made (dispatcher/ local fire department)
- ☐ Adequate burn map provided to all personnel
- ☐ All smoke management specifications are met and addressed
- ☐ Wind direction (within burn plan specifications); Actual direction on site: _____
- ☐ Wind speed (3-20mph); Actual wind speed on site: _____
- ☐ Relative Humidity (25-60%); Actual RH on site: _____
- ☐ Temperature (32°F-80° F); Actual temperature on site: _____
- ☐ Above weather parameters are within burn plan prescription
- ☐ All of the necessary equipment is available and operational
- ☐ The contingency plan and available resources have been discussed and are available
- ☐ All fire prescription elements are met

_____ _____

Burn Boss Date

Post Burn Results

Crew Members/Lines: _____

Equipment: _____

Were Objectives Met?: _____

Fire Behavior: _____

Recommended Changes: _____

Time Fire was completed and out: _____

Post Burn Notes

Baumeister Parcel Burn Map





Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Railroads
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Assets to Protect

0.1 0 0.06 0.1 Miles

1: 3,960

NAD_1983_HARN_Wisconsin_TM

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

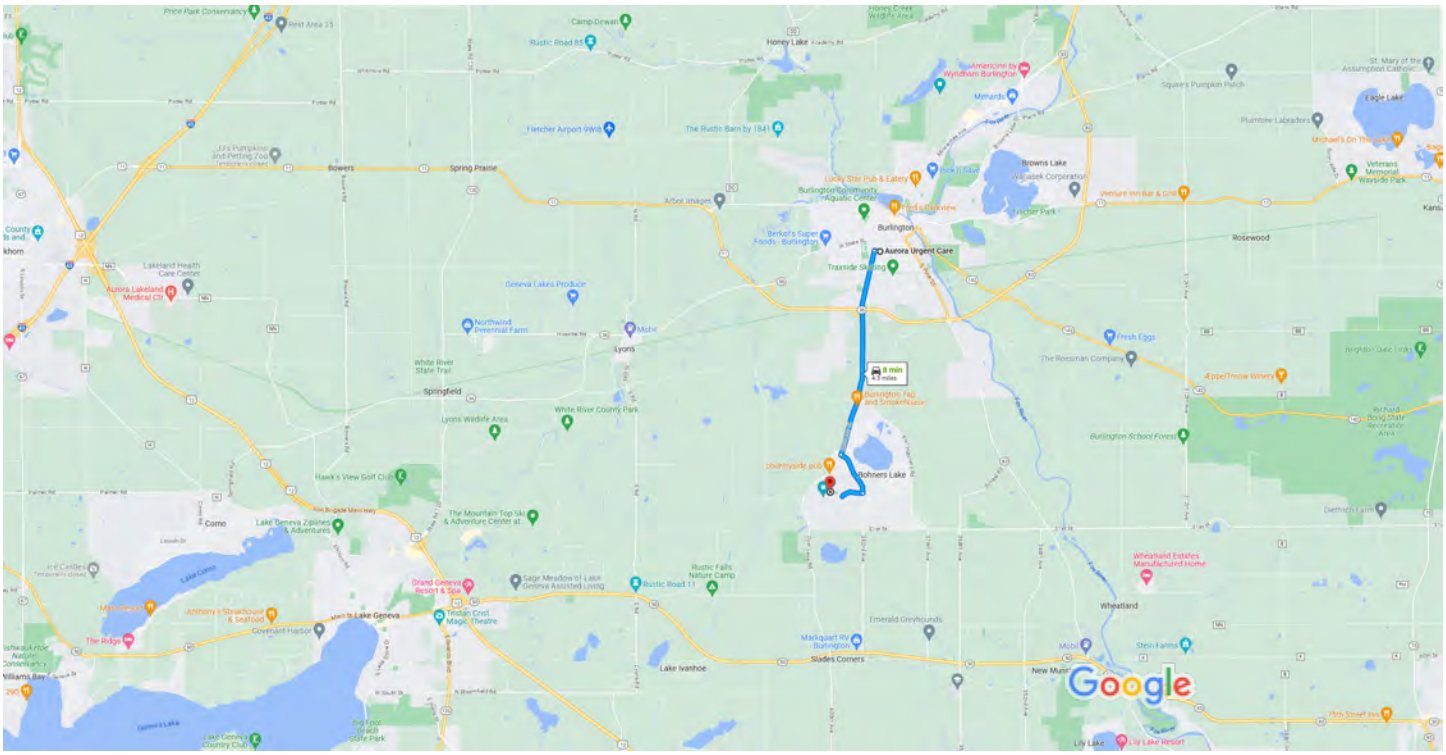
Notes

Google Maps

Aurora Urgent Care, 248 McHenry St, Burlington, WI 53105 to Wisconsin, 53105

Drive 4.3 miles, 8 min

Urgent Care Facility



Map data ©2023 Google 1 mi

Aurora Urgent Care
248 McHenry St, Burlington, WI 53105

1. Head west toward McHenry St — 226 ft
2. Slight right toward McHenry St — 217 ft
3. Turn left onto McHenry St — 3.2 mi
4. Turn left onto Fishman Rd — 0.7 mi
5. Turn right onto Country View Ln — 0.3 mi

Wisconsin
53105

Appendix G | WisDOT Monitoring Reports

BAUMEISTER WETLAND MITIGATION SITE

FIRST YEAR MONITORING REPORT

DECEMBER 2007

Wisconsin Department of Transportation
Southeast District
141 NW Barstow Street
PO Box 798
Waukesha, WI 53187-0798

Prepared by:

Karla Leithoff
Wisconsin Department of Transportation

and

Scott Horzen
T N & Associates, Inc.

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Exhibit 3: Construction Special Provisions for the Baumeister Wetland Mitigation Site

1.0 INTRODUCTION

Construction of the Burlington Bypass (STH 11) required grading, filling and excavation for the new roadway and for vertical and horizontal realignment at intersecting roadways. The first phase of construction (*STH 11 Bypass Eastern Segment*) began in the spring of 2006 and resulted in unavoidable wetland loss totaling 37.10 acres. Prior to construction of this bypass segment, in 1997, the Wisconsin Department of Transportation (WisDOT) conducted a wetland mitigation site search. The Baumeister parcel (Site) was identified as a potential site for compensatory mitigation for wetland impacts associated with the STH 11 Bypass Eastern Segment. The 45.48-acre Site was subsequently purchased by the WisDOT, which restored wetland plant communities that likely occurred historically in this area and enhanced existing natural communities on other portions of the Site.

According to the U.S. Army Corps of Engineers correspondence (2006-2807-DJP) for this project, dated June 8, 2006, the project was designed to preserve 3.4 acres of existing wetlands and 3.91 acres of upland forest; restore 5.05 acres of upland to tall grass prairie, and restore approximately 33.12 acres of prior-converted wetlands. The project included drain tile disablement, and planting and seeding of the upland and wetland restoration areas. The expected wetland plant communities included in the construction plans were 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres of wet meadow, and 5.05 acres of tall grass prairie. During the construction phase of the project, the tall grass prairie restoration area was reduced to 3.65 acres. The remaining 1.4 acres intended for tall grass prairie restoration was preserved in its existing state.

Annual monitoring of the site is required for five years. During this period, public access to the site is prohibited. This first-year monitoring report describes site construction and evaluates the first post-construction growing season hydrology and plant communities.

1.1 Site Description

Physical Description of Site

The 45.48-acre Site is located east of CTH P and north of Dyer Lake in the northwest 1/4 of Section 19, Township 2 North, Range 19 East (Figure 1). Dyer Lake is located approximately ½ mile south of the Site in Kenosha County and is connected to the Site by an unnamed tributary that flows in a northeast direction. The Site is bounded primarily by drainage ditches and an unnamed tributary that converge at its northeast corner where the drainage flows in a northeast direction and empties into Bohner Lake. The output from Bohner Lake is Spring Brook, which flows into the Fox River just south of the City of Burlington (Figure 1). Its watershed is an approximate 2.2 square mile area in which the primary land use is rural, including both agricultural and residential development. There are also a number of wetlands and small lakes in the watershed. The local watershed contributing to the Site consists of 69 acres of land.

The ditches were apparently constructed to convey water outputting from an extensive drain tile system that had been installed throughout the entire prior-converted wetland area. The banks and an approximate 25-foot wide strip of vegetation along the tributary and drainage ditches consisted of wet meadow, lowland forest and shrub carr wetland that were dominated by common buckthorn (*Rhamnus cathartica*), honeysuckle species (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*), and willow species (*Salix* spp.). Prior to construction, existing wetlands on the Site associated with the ditches and tributary totaled 3.40 acres. Uplands were present in the southern and western portions of the Site (5.05 acres), as well as a prior converted wetland that was typically planted in corn (33.12 acres).

During the construction phase, the drain tile system was disabled and the prior converted wetland restored to shallow marsh, deep marsh, and wet meadow. Upland areas were restored to tall grass prairie. The remainder of the Site consists of 3.91 acres of land that is upland forest, a constructed access point, and other areas not disturbed by the project. Existing wetlands and forested areas were preserved and the entire Site will be managed throughout the 5-year monitoring period to control and eradicate non-native and invasive species.

Land Use

The majority of the Site was utilized for row crop agriculture. According to the previous landowner, the parcel was usually planted in corn. Land use adjacent to the Site consists of several residences, one commercial property, agricultural fields, existing wetlands, and woodlands.

Soils

The Soil Survey of Kenosha and Racine Counties, Wisconsin (Soil Survey) (USDA SCS 1970) identifies the following soil mapping units within the mitigation site: Houghton muck (Ht), Radford silt loam, 0 to 3 percent slopes (RaA), Casco-Rodman Complex, 20 to 35 percent slopes (CrE), Casco loam, 12 to 20 percent slopes, eroded (CeD2), and Fox loam, 6 to 12 percent slopes, eroded (FoC2) (Figure 2).

Houghton muck soils comprise the majority of the Site and consist of very poorly drained, deep, organic soils that have formed from the decomposition of grasses and sedges. Houghton muck soils generally form in broad depressions and basins and have poor internal drainage.

Radford soils are somewhat poorly drained and occupy small depressions, drainageways, and other wet areas that abut well-drained, eroded slopes. Radford soils typically have slow surface runoff, moderate permeability, and slow internal drainage. The Radford soils found on the Site are found on slopes ranging from 0 to 3 percent.

The Casco-Rodman complex and Casco soils on the Site consist of well-drained to excessively drained, loamy soils that have formed over calcareous sand and gravel outwash. They generally are found along the rim of glacial moraines and are mildly to moderately eroded. The Casco soils within the Site are found in steeper areas with slopes

ranging from 12 to 20 percent (CeD2) and from 20 to 35 percent (CrE). The rate of runoff and potential for erosion is high in these soils.
Fox silt loam soils consist primarily of well-drained, loamy soils over calcareous sand and gravel outwash. The Fox soils found on the Site lie on gently sloping terrain ranging from 6 to 12 percent slopes and have a moderate potential for erosion and medium potential for runoff.

The Racine County hydric soils list indicates that Houghton muck is a hydric whole soil unit, while the list indicates that Radford silt loam has hydric inclusions of wetter soils. Houghton muck is also listed as hydric in *Hydric Soils of the United States,* a USDA Natural Resources Conservation Service publication.

1.2 Goals and Objectives

The primary construction goals established for the Baumeister wetland mitigation site were coordinated with the WDNR and focused on restoration of prior-converted wetlands to native wetland plant communities.

- The primary functional goals for the wetland mitigation site include:

    1) improve quality of water flowing into Bohner Lake
    2) expand the existing primary environmental corridor
    3) increase the amount and quality of wildlife habitat within the region

Specific goals developed during the design phase for the wetland mitigation site included:

- increase the level of significance for wetland functional values such as wildlife habitat, water quality, shoreline protection, aesthetics, and floral diversity by restoring the native plant communities (wet meadow, shallow marsh, deep marsh and tall grass prairie)

- enhance the value of wildlife habitat by managing vegetation to increase floral species diversity and decrease the area dominated by invasive species

- Provide habitat for grassland birds that are species of management concern (WDNR 1997).

The primary long-term objective for the Site is to establish a self-sustaining wetland by restoring an area of prior converted wetland to wet meadow, shallow marsh and deep marsh. Specific criteria for plant community establishment are as follows:

- At least 50 percent cover by desirable hydrophytic species by the 5th year following construction
- Establishment of at least 80 percent of the estimated wetland acreage shown in the plan
- At least 75 percent native species cover by the 5th year following construction

Criteria for success of the existing wetland management areas are as follows:

- elimination of all fruiting buckthorn and honeysuckle shrubs
- net reduction of the total areal coverage of reed canary grass by a minimum of 25%

In accordance with the Plans and Special Provisions (Exhibits 2 and 3, respectively), mitigation site construction began in September 2006 with drain tile disablement, followed by rootstock planting and seeding (Table 1). Site construction was completed in November 2006.

2.0 METHODS

2.1 Vegetation

Sampling of the Baumeister Site occurred on June 28 and September 19, 2007. Plant species were identified and cover calculated using the line-intercept method. This method is useful for sampling grasses and sedges where individual counts can be tedious. Three transects were run across the Site (Figure 4). Plant species were identified starting at 0 meters and then every 15 meters along each transect. Cover, or the amount of physical space a given plant occupies, was measured in the following manner: a meter tape was laid on the transect line, and using the transect point as zero, plants were sampled from 1 to 2 meters and from 3 to 4 meters on both sides of the transect. Any plant that intercepted the vertical projection of these segments of the line was identified and its cover was measured as the length of the meter tape intercepted. Plant cover was recorded to the nearest decimeter (10th of a meter) that each species intercepted the line. All plant species identified on the wetland site during monitoring activities are included in a cumulative wetland species list (Table 2).

Percent cover, relative percent cover, and relative percent frequency were calculated for each species found on all of the transect lines (Tables 3-6). Percent cover for each species was measured by summing all of the vegetative cover for each transect line and dividing by the total sample length. Relative percent cover was estimated by dividing the cover value for each species by the total cover values of all species. Relative percent frequency was estimated by dividing the frequency value for a species by the total frequency values for all species. Plant species were grouped and compared according to their percent relative cover, wetland indicator status, and seed source (native vs. non-native). In order to maintain consistency, all individuals that could only be identified to the level of genus were labeled as unknown when categorizing wetland indicator status, seed source, and life cycle. The following indicator status categories detail how plants were evaluated for their estimated probability of occurring in wetlands (Reed 1988):

Indicator Status	Indicator Status Symbol	Description
Obligate Wetland	OBL	almost always occurs in wetlands (estimated >99% probability) under natural conditions
Facultative Wetland (FACW)	FACW	usually occurs in wetlands (estimated 67-99% probability) but occasionally found in non-wetlands
Facultative (FAC)	FAC	equally likely to occur in wetlands (estimated 34-66% probability) or uplands
Facultative upland	FACU	usually occurs in non-wetlands, but occasionally found in wetlands (estimated 1-33% probability)
Obligate upland	UPL	almost never occurs in wetlands (estimated <1% probability)under natural conditions

A plus (+) or minus (-) symbol after a wetland indicator ranking shows a tendency toward the wetter or drier ranking, respectively. The indicator status rankings are based on the *National List of Plant Species that Occur in Wetlands: North Central (Region 3)* (Reed 1988).

2.2 Hydrology

Pre-construction hydrologic data included an engineering analysis to determine hydrology and depth to ground water. Monitoring wells were installed on site by WisDOT in 2003. A plan for restoration of wetland hydrology and the post-construction hydroperiod were developed based on the information gathered from the wells from April 2003 through September 2005. The site revegetation plan was then developed and based on the projected post-construction hydroperiod. Hydrology will be further assessed during the fifth monitoring year wetland delineation and as necessary if plant community response is noted to be insufficient during the monitoring period.

2.3 Wildlife

Although not a specified activity in the Army Corps of Engineers permit, casual wildlife observations were recorded during monitoring activities. All wildlife identified was noted in a field notebook. Though undoubtedly incomplete, the data collected provides some measure of wildlife usage of the parcel.

3.0 RESULTS

3.1 Vegetation

The cumulative list of plant species identified on this site totals 92 species (Table 2). Of this total, 58 species were intercepted by the 2007 vegetation transects and are listed alphabetically in

Table 3. The total percent cover for all vegetation strata is 330.78, with zero percent bare ground.

Species intercepted by the vegetation transects were ordered from the most abundant to the least abundant in Table 4. Based on relative percent cover for 2007, those species in greatest abundance were giant ragweed (*Ambrosia trifida*; 43.14%), yellow foxtail (*Setaria glauca*; 30.83%), eastern willow-herb (*Epilobium coloratum*; 30.49%), water pepper (*Polygonum hydropiperoides*; 27.50%), green foxtail (*Setaria viridis*; 25.29%), common ragweed (*Ambrosia artemisiifolia*; 23.68%), rice cut-grass (*Leersia oryzoides*; 22.79%), giant foxtail (*Setaria faberi*; 15.59%), false nutsedge (*Cyperus strigosus*; 14.02%), and lady's thumb (*Polygonum persicaria*; 13.68%). Of the ten most abundant species, six have a wetland indicator status of FAC+ or greater.

Table 5 shows species intercepted by the vegetation transects and sorted by wetland indicator status. Sixteen species of obligate wetland plants represented 29.0% of the total relative cover. Facultative wetland plants (FACW+, FACW and FACW-) accounted for another 20.55%. Facultative (FAC+ and FAC) plants totaled 27.53%. In combination, these wetland indicator species accounted for 77.08% of the relative cover of vegetation sampled (Figures 5a and 5b).

Data was also sorted to examine the relative cover of native versus exotic (non-native) plant species (Table 6). Native vegetation consisted of 55.63% of the vegetation intercepted. The most abundant native species included giant ragweed (43.14%), eastern willow-herb (30.49%), common ragweed (23.68%), rice cut-grass (22.79%), and false nutsedge (14.02%).

The relative cover of non-native species on the site (Figures 6a and 6b) was 44.37%, with yellow foxtail (30.83%), water pepper (*P. hydropiper*; 27.50%), green foxtail (25.29%), giant foxtail (15.59%), and lady's thumb (13.68%) as the five most abundant non-native species. Of the non-native species found on the site, 29% were perennials, 53% annuals and 18% biennials/annuals.

Special conditions in the Army Corps of Engineers permit require that vegetation cover maps at a scale of 1 inch equals 400 feet, or larger scale, be prepared for each growing season; since this is a first year monitoring report, the planting zones, as indicated in the construction plans are shown on Figure 3. Three wetland plant communities are developing that include deep marsh, shallow marsh and wet meadow, as well as the upland tallgrass prairie.

The Army Corps of Engineers permit also includes a special condition that permanent photo-vantage points be established and representative photographs of the mitigation site be taken during the period between July 1 and September 30. Eight photo-vantage points were established and pictures were taken during the 2007 growing season (Figures 4 and 7a-7h).

3.2 Hydrology

Meteorological data for the period from April through October, 2007 (Table 7) indicates that precipitation was higher than average for the growing season. A total of 27.46 inches of precipitation were recorded in 2007 from April through October, a surplus of 2.05 inches as compared to normal average annual precipitation. Precipitation totals for both the growing season and the year were recorded as being significantly higher than normal during 2007,

primarily due to heavy rain events during August.

Average temperatures during April through October, 2007 were warmer during four of the seven months, with an average temperature of 63°F as compared to the normal average temperature of 60° F.

3.3 Wildlife

Observations made during the vegetation monitoring show that a number of animal species utilize the Site (Table 8). White-tailed deer (*Odocoileus virginianus),* a mammal, was sighted during field reviews as well as several amphibians including the American toad (*Bufo americanus*), green frog (*Rana clamitans)* and northern leopard frog (*Rana pipiens*). An invertebrate, the garden spider (*Argiope aurantia*), was also sighted. Avifauna observed included great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), common yellowthroat (*Geothlypis trichas*), and wild turkey (*Meleagris gallopavo*).

4.0 DISCUSSION

4.1 Vegetation

The primary goals established for the Site during the design phase were to improve the quality of runoff into tributaries by establishing dense vegetative cover, expanding the primary environmental corridor, and increasing the amount and quality of regional wildlife habitat. These goals were achieved through cessation of agricultural practices and expansion of wetland plant communities as habitat adjacent to the existing environmental corridor. The restored wetlands naturally function to provide soil stabilization, erosion deterrence, stormwater retention, and habitat value for a variety of species.

First-year monitoring results indicate the parcel has high vegetative cover and diversity, having a total vegetation cover for all strata of 330.78 % with zero % bare ground. Of the ten most prevalent species, three are native perennials, two are native annuals, one is a non-native perennial and four are non-native annuals. As noted earlier, native species accounted for 55.63% relative cover, approximately 63.4% of which are perennials. The majority of the non-native species observed on the Site are typically found in first-year abandoned agricultural areas. In terms of species richness, native vegetation dominates the site with 41 of the 58 species observed on the sample transects identified as native flora.

In addition, the high percentage of wetland indicator species (77.08% relative cover) indicates favorable conditions exist for establishment of wetland plant communities. As the agricultural weed seed bank gradually becomes depleted, wetland species are expected to comprise a larger percentage of the total vegetative cover.

As documented by monitoring efforts, reed canary grass (*Phalaris arundinacea*) was observed on the Site; however, the relative cover of this species was calculated at 0.28%, indicating that there were no observable monotypic stands of this species in 2007. Because infiltration of reed canary grass could pose a serious threat to native species diversity if it were to become more prevalent in the mitigation area, management activities are planned, such as application of

herbicides that will assist with controlling the spread of this species. Efforts to control other non-native perennials as they appear on the Site would also prove beneficial to native species diversity.

4.2 Hydrology

As part of the design process, hydrology was assessed to determine what sources of water contribute to the Site and affect the shallow ground water table. This information is important in determining revegetation plans because the depth of the shallow water table positively correlates with distribution of wetland vegetation. The water table at the Site is high, resulting in soil saturation to the surface and ponding in depressional areas during normal precipitation years. Even though the degree of soil saturation fluctuates somewhat following precipitation events, the shallow ground water table remains at a fairly consistent level because its primary water source is from ground water discharge.

Because of the relative stability of the Site hydrology, success of the wetland restoration will be assessed in terms of vegetation response. Hydrology will be assessed further during the 5th year monitoring period as well.

4.3 Wildlife

Wildlife diversity is expected to increase with the succession of a variety of habitats and vegetation capable of providing food and cover. In addition to the species observed during vegetation monitoring visits, waterfowl species and sandhill cranes (*Grus canadensis*) were observed in and adjacent to the Site during construction. Other wildlife observed during the construction phase included eastern milk snake (*Lampropeltis triangulum*), common gartersnake (*Thamnophis sirtalis*), Canada goose (*Branta canadensis*), and a variety of common migratory songbirds.

The number of animal species recorded during vegetation monitoring is rather misleading due to the infrequency of visits. These brief monitoring visits provided only limited opportunities to observe wildlife, resulting in little information regarding the presence of herptiles, invertebrates and waterfowl.

5.0 CONCLUSION

The Baumeister Wetland Mitigation Site shows many characteristics of a first-year mitigation site. Several weedy species were observed on the Site that are typically found in first year abandoned agricultural areas because their seed is widespread in the soil seed bank. Although these non-native species are present, native wetland vegetation currently dominates the Site. Many of the native species becoming established are typical of fresh wet meadow, a plant community type consistent with the revegetation goals established for the Site. In terms of species richness, native vegetation dominates the site with 41 of the 58 (70.68%) species observed on the sample transects identified as native flora. Annual weed species are expected to show a reduction in cover as the soil seed bank is depleted.

During the remainder of the 5-year monitoring period, control of invasive species will be addressed, as they could pose a threat to the success of the site if not properly managed.

6.0 REFERENCES

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APPENDIX A:

Tables

Table 1. List of Species Planted at the Baumeister Wetland Mitigation Site

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS	OBSERVED ON SITE
SEED			
Wet Meadow Planting Zone			
Alisma triviale	water plantain	OBL	Yes
Angelica autropurpurea	pruple stemmed angelica	OBL	No
Asclepias incarnata	swamp-milkweed	OBL	No
Aster novae-angliae	New England aster	FACW	Yes
Aster puniceus	bristly aster	OBL	No
Calamagrostis canadensis	Canada bluejoint	OBL	No
Carex comosa	bottle brush sedge	OBL	No
Carex cristatella	crested oval sedge	OBL	No
Carex granularis	meadow sedge	FACW+	No
Carex hystericina	porcupine sedge	OBL	No
Carex scoparia	lance-fruited oval sedge	FACW	Yes
Carex stipata	common fox sedge	OBL	No
Carex vulpinoidea	brown fox sedge	OBL	Yes
Elymus canadensis	Canada wild rye	FAC-	No
Eupatorium maculatum	joe pye weed	OBL	No
Eupatorium perfoliatum	boneset	FACW+	Yes
Glyceria striata	fowl-mannagrass	OBL	No
Helenium autumnale	common sneezeweed	FACW+	No
Leersia oryzoides	rice cut-grass	OBL	Yes
Mimulus ringens	Allegheny monkey-flower	OBL	Yes
Scirpus atrovirens	black bulrush	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Solidago gigantea	smooth goldenrod	FACW	Yes
Thalictrum dasycarpum	purple meadow-rue	FACW-	No
Verbena hastata	common (blue) vervain	FACW+	Yes
Vernonia fasciculata	smooth ironweed	FACW	No
Shallow Marsh			
Alisma triviale	northern water plantain	OBL	Yes
Glyceria striata	fowl-mannagrass	OBL	No
Scirpus acutus	hardstem-bulrush	OBL	Yes
Scirpus cyperinus	common wool grass	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	No
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes
Zizania aquatica	wild rice	OBL	No
Tallgrass Prairie			
Andropogon gerardii	big bluestem	FAC-	No
Bouteloua curtipendula	side-oats gramma-grass	UPL	No
Desmodium canadense	Canadian tick-trefoil	FAC-	No
Echinacea purpurea	broad-leaved purple coneflower	UPL	No
Elymus canadensis	Canada wild rye	FAC-	No
Heliopsis helianthoides	sunflower-everlasting, false sunflower	UPL	No
Monarda fistulosa	wild bergamot	FACU	No
Panicum virgatum	switch grass	FAC+	No
Ratibida pinnata	globular coneflower	UPL	No
Rudbeckia hirta	black-eyed Susan	FACU	No
Schizachyrium scoparium	little bluestem	FACU-	No
Solidago rigida	stiff goldenrod	FACU-	No
Sorghastrum nutans	Indian grass	FACU+	No
Sporobolus heterolepis	prairie dropseed	FACU-	No
ROOTSTOCK			
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	No
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Scirpus validus	soft stem bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes

Table 2. Cumulative List of Plant Species Identified at the Baumeister Wetland Mitigation Site 2006-2007

1 *Abutilon theophrasti*
2 *Acer negundo*
3 *Achillea millefolium*
4 *Agrostis gigantea*
5 *Alisma triviale*
6 *Alliaria petiolata*
7 *Amaranthus hybridus*
8 *Ambrosia artemisiifolia*
9 *Ambrosia trifida*
10 *Asclepias syriaca*
11 *Aster ericoides*
12 *Aster lanceolatus*
13 *Aster novae-angliae*
14 *Aster pilosus*
15 *Barbarea vulgaris*
16 *Bidens cernua*
17 *Bidens frondosa*
18 *Bromus inermis*
19 *Capsella bursa-pastoris*
20 *Carex scoparia*
21 *Carex vulpinoidea*
22 *Chenopodium album*
23 *Cirsium arvense*
24 *Cirsium vulgare*
25 *Conus stolonifera*
26 *Conyza canadensis*
27 *Cornus racemosa*
28 *Cyperus esculentus*
29 *Cyperus strigosus*
30 *Daucus carota*
31 *Desmodium canadense*
32 *Dipsacus sylvestris*
33 *Echinochloa crusgalli*
34 *Echinocystis lobata*
35 *Eleocharis erythropoda*
36 *Elytrigia repens*
37 *Epilobium coloratum*
38 *Erigeron strigosus*
39 *Eupatorium perfoliatum*
40 *Euthamia graminifolia*
41 *Fraxinus pensylvanica*
42 *Geum aleppicum*
43 *Hordeum jubatum*
44 *Impatiens capensis*
45 *Lactuca serriola*
46 *Leersia oryzoides*
47 *Lycopus americanus*
48 *Mimulus ringens*
49 *Oenothera biennis*
50 *Panicum capillare*
51 *Panicum dichotomiflorum*
52 *Penthorum sedoides*
53 *Phalaris arundinacea*
54 *Phleum pratense*
55 *Pilea pumila*
56 *Plantago major*
57 *Poa pratensis*
58 *Polygonum amphibium*
59 *Polygonum hydropiper*
60 *Polygonum hydropiperoides*
61 *Polygonum lapathifolium*
62 *Polygonum pensylvanicum*
63 *Polygonum persicaria*
64 *Polygonum sagittatum*
65 *Potentilla norvegica*
66 *Rhamnus cathartica*
67 *Rorippa palustris*
68 *Rumex crispus*
69 *Sagittaria latifolia*
70 *Salix discolor*
71 *Scirpus atrovirens*
72 *Scirpus cyperinus*
73 *Scirpus fluviatilis*
74 *Scirpus validus*
75 *Setaria faberi*
76 *Setaria glauca*
77 *Setaria viridis*
78 *Solidago canadensis*
79 *Solidago gigantea*
80 *Sonchus asper*
81 *Sonchus oleraceus*
82 *Sparganium eurycarpum*
83 *Taraxacum officinale*
84 *Thlaspi arvense*
85 *Trifolium hybridum*
86 *Trifolium pratense*
87 *Trifolium repens*
88 *Typha latifolia*
89 *Ulmus americana*
90 *Urtica dioica*
91 *Verbena hastata*
92 *Verbena urticifolia*

Table 3. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Non-Vegetation							
Open Water	Other	Other	Other	Other	0.00	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.00%**	**0.00%**
Vegetation							
Acer negundo	boxelder	FACW-	N	P	0.44	0.13%	0.72%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.46%	0.95%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.04%	0.24%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.80%	1.19%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	7.16%	5.25%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	13.04%	6.92%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.01%	0.24%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.06%	0.24%
Bidens cernua	bur-marigold	OBL	N	A	0.69	0.21%	0.48%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	1.30%	2.15%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.06%	0.24%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.22%	0.24%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.04%	0.24%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.03%	0.24%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.90%	1.19%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	4.24%	4.53%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.39%	0.48%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.15%	0.24%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	1.33%	2.86%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	9.22%	6.68%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	0.03%	0.24%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	2.61%	2.39%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	0.44%	0.72%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.01%	0.24%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	6.89%	4.77%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	0.06%	0.72%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	0.03%	0.24%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.07%	0.24%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	1.69%	2.15%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	0.58%	0.95%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	0.28%	0.72%
Pilea pumila	clearweed	FACW	N	A	1.91	0.58%	0.48%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	1.47%	0.95%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	0.27%	0.95%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	8.31%	5.25%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	0.10%	0.24%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	0.01%	0.24%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 3. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.49%	0.72%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	4.13%	5.49%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	1.29%	1.43%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	0.04%	0.72%
Rumex crispus	curly dock	FAC+	E	P	5.00	1.51%	3.10%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	0.01%	0.24%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.03%	0.24%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	0.27%	0.72%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	0.55%	0.72%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	1.11%	0.95%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	4.71%	4.53%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	9.32%	7.40%
Setaria viridis	green foxtail	FAC-	E	A	25.29	7.65%	7.40%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.03%	0.24%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.34%	0.95%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.09%	0.48%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	0.04%	0.24%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.06%	0.24%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	3.50%	4.53%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	1.41%	2.63%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.16%	0.24%
Total Vegetation					**330.78**	**100.00%**	**100.00%**
OVERALL TOTALS					**330.78**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by decreasing percent relative cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Non-Vegetation							
Open Water	Other	Other	Other	Other	0.00	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.00%**	**0.00%**
Vegetation							
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	13.04%	6.92%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	9.32%	7.40%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	9.22%	6.68%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	8.31%	5.25%
Setaria viridis	green foxtail	FAC-	E	A	25.29	7.65%	7.40%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	7.16%	5.25%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	6.89%	4.77%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	4.71%	4.53%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	4.24%	4.53%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	4.13%	5.49%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	3.50%	4.53%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	2.61%	2.39%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	1.69%	2.15%
Rumex crispus	curly dock	FAC+	E	P	5.00	1.51%	3.10%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	1.47%	0.95%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	1.41%	2.63%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	1.33%	2.86%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	1.30%	2.15%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	1.29%	1.43%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	1.11%	0.95%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.90%	1.19%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.80%	1.19%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	0.58%	0.95%
Pilea pumila	clearweed	FACW	N	A	1.91	0.58%	0.48%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	0.55%	0.72%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.49%	0.72%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.46%	0.95%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	0.44%	0.72%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.39%	0.48%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.34%	0.95%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	0.28%	0.72%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	0.27%	0.95%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	0.27%	0.72%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.22%	0.24%
Bidens cernua	bur-marigold	OBL	N	A	0.69	0.21%	0.48%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.16%	0.24%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.15%	0.24%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by decreasing percent relative cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Acer negundo	boxelder	FACW-	N	P	0.44	0.13%	0.72%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	0.10%	0.24%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.09%	0.48%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.07%	0.24%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.06%	0.24%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.06%	0.24%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	0.06%	0.72%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.06%	0.24%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.04%	0.24%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.04%	0.24%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	0.04%	0.72%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	0.04%	0.24%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.03%	0.24%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	0.03%	0.24%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	0.03%	0.24%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.03%	0.24%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Non-Vegetation							
Open Water	Other	Other	Other	Other	0.00	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.00%**	**0.00%**
Obligate Wetland Vegetation (OBL)							
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	9.22%	6.68%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	8.31%	5.25%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	6.89%	4.77%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	1.29%	1.43%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	1.11%	0.95%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	0.58%	0.95%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	0.55%	0.72%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	0.27%	0.95%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	0.27%	0.72%
Bidens cernua	bur-marigold	OBL	N	A	0.69	0.21%	0.48%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	0.10%	0.24%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	0.06%	0.72%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.06%	0.24%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	0.04%	0.24%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	0.03%	0.24%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	0.01%	0.24%
Total Obligate Wetland Vegetation					**95.93**	**29.00%**	**24.82%**
Facultative Wetland Vegetation (FACW+, FACW, FACW-)							
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	4.24%	4.53%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	4.13%	5.49%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	2.61%	2.39%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	1.69%	2.15%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	1.41%	2.63%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	1.33%	2.86%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	1.30%	2.15%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.90%	1.19%
Pilea pumila	clearweed	FACW	N	A	1.91	0.58%	0.48%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.49%	0.72%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.46%	0.95%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	0.44%	0.72%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.34%	0.95%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	0.28%	0.72%
Acer negundo	boxelder	FACW-	N	P	0.44	0.13%	0.72%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.06%	0.24%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.06%	0.24%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.03%	0.24%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.03%	0.24%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.01%	0.24%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	0.01%	0.24%

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Total Facultative Wetland Vegetation					**67.99**	**20.55%**	**30.07%**
Facultative Wetland Vegetation (FAC+, FAC)							
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	13.04%	6.92%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	9.32%	7.40%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	3.50%	4.53%
Rumex crispus	curly dock	FAC+	E	P	5.00	1.51%	3.10%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.07%	0.24%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.04%	0.24%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	0.04%	0.72%
Total Facultative Vegetation					**91.08**	**27.53%**	**23.15%**
Facultative (-) Vegetation (FAC-)							
Setaria viridis	green foxtail	FAC-	E	A	25.29	7.65%	7.40%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	1.47%	0.95%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.22%	0.24%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.04%	0.24%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	0.03%	0.24%
Total Facultative (-) Vegetation					**31.13**	**9.41%**	**9.07%**
Facultative Upland Vegetation (FACU+, FACU, FACU-)							
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	7.16%	5.25%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	4.71%	4.53%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.09%	0.48%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.03%	0.24%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.01%	0.24%
Total Facultative Upland Vegetation					**39.71**	**12.00%**	**10.74%**
Upland Vegetation (UPL)							
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.80%	1.19%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.39%	0.48%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.16%	0.24%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.15%	0.24%
Total Upland Vegetation					**4.95**	**1.50%**	**2.15%**
OVERALL TOTALS					**330.78**	**100.00%**	**100.00%**

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by origin)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Non-Vegetation							
Open Water	Other	Other	Other	Other	0.00	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.00%**	**0.00%**
Native Vegetation							
Acer negundo	boxelder	FACW-	N	P	0.44	0.13%	0.72%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	7.16%	5.25%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	13.04%	6.92%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.01%	0.24%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.06%	0.24%
Bidens cernua	bur-marigold	OBL	N	A	0.69	0.21%	0.48%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	1.30%	2.15%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.06%	0.24%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.04%	0.24%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.03%	0.24%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.90%	1.19%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	4.24%	4.53%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	9.22%	6.68%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	0.03%	0.24%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	2.61%	2.39%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	0.44%	0.72%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.01%	0.24%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	6.89%	4.77%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	0.06%	0.72%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	0.03%	0.24%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.07%	0.24%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	1.69%	2.15%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	0.58%	0.95%
Pilea pumila	clearweed	FACW	N	A	1.91	0.58%	0.48%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	0.27%	0.95%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	0.10%	0.24%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	0.01%	0.24%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.49%	0.72%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	1.29%	1.43%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	0.04%	0.72%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	0.01%	0.24%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.03%	0.24%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	0.27%	0.72%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	0.55%	0.72%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	1.11%	0.95%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.03%	0.24%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.34%	0.95%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	0.04%	0.24%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.06%	0.24%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	1.41%	2.63%

* N = native, E = exotic, P = perennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007 Vegetation Survey (sorted by origin)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover 2007	Relative Cover 2007	Relative Frequency 2007
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.16%	0.24%
Total Native Vegetation					**184.02**	**55.63%**	**53.94%**
Exotic Vegetation							
Agrostis gigantea	redtop	FACW	E	P	1.52	0.46%	0.95%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.04%	0.24%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.80%	1.19%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.22%	0.24%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.39%	0.48%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.15%	0.24%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	1.33%	2.86%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	0.28%	0.72%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	1.47%	0.95%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	8.31%	5.25%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	4.13%	5.49%
Rumex crispus	curly dock	FAC+	E	P	5.00	1.51%	3.10%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	4.71%	4.53%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	9.32%	7.40%
Setaria viridis	green foxtail	FAC-	E	A	25.29	7.65%	7.40%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.09%	0.48%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	3.50%	4.53%
Total Exotic Vegetation					**146.76**	**44.37%**	**46.06%**
OVERALL TOTALS					**330.78**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 7. Meteorological Data for the Baumeister Wetland Mitigation Site (2007)

Normals based on data from National Climate Data Center (Burlington, Wisconsin)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Precipitation (in.)													
Normal	1.58	1.29	2.30	3.69	3.14	3.96	3.77	4.16	3.27	2.31	2.56	1.94	33.97
2007	1.35	1.97X	2.22	4.07	1.08	4.44	3.92	11.47	1.50	3.02	N/A	N/A	38.37*
Average Temperature (F)													
Normal	18.0	23.0	33.0	45.0	56.0	66.0	71.0	69.0	61.0	49.0	36.0	24.0	45.92
2007	24.3	12.7X	37.2	42.7	59.3	67.0	68.8	70.5	62.6	55.5	53.8	N/A	54.2**

Notes:

N/A = Data not available

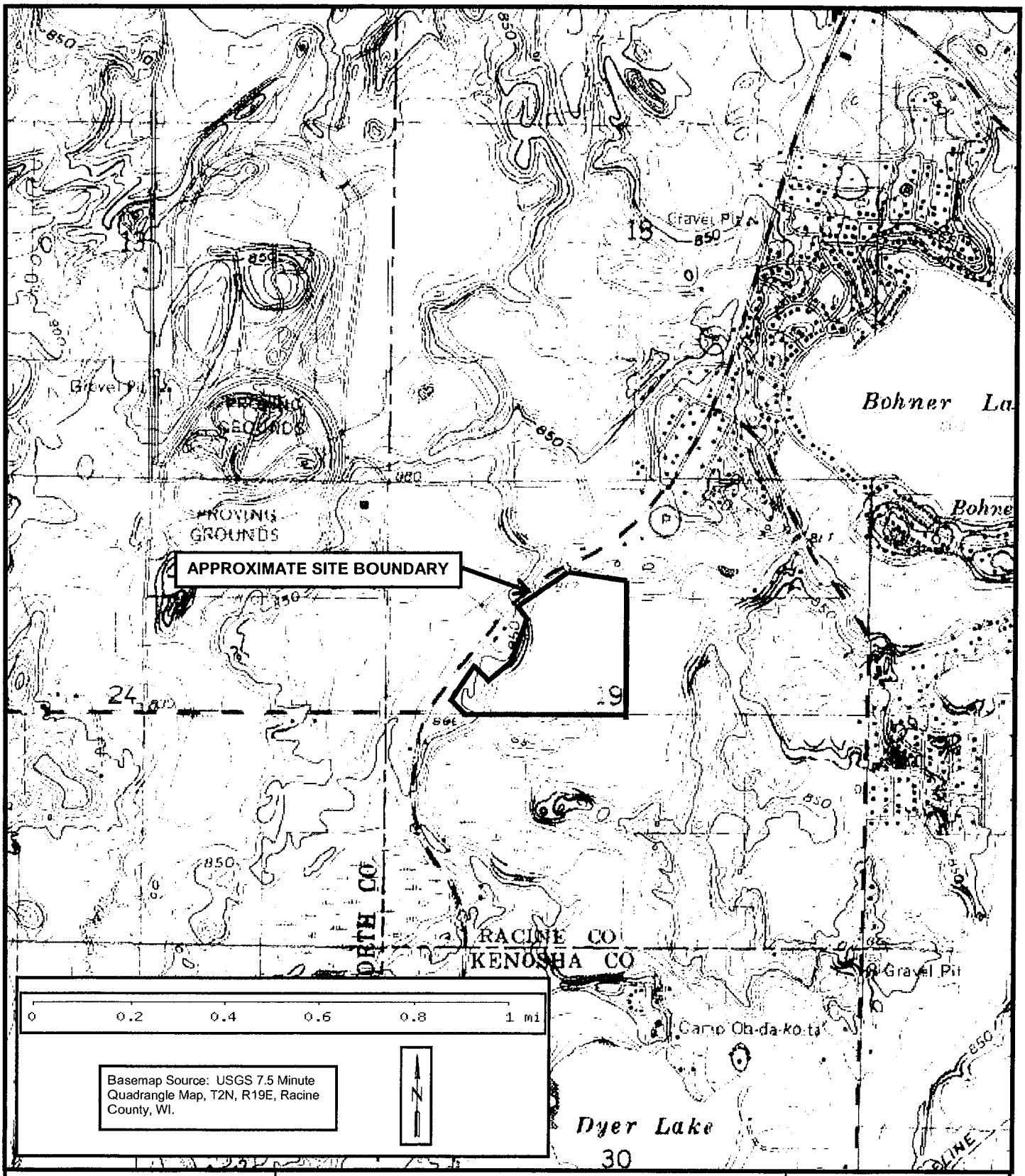
X = Monthly means or totals based on incomplete time series; 1-9 days missing.

* Does not include data from November or December

** Does not include data from February and December

Table 8. List of Wildlife Species Observed at the Baumeister Wetland Mitigation Site 2007

Scientific Name	Common Name	Evidence
Invertebrates		
Argiope aurantia	garden spider	visual
Amphibians		
Bufo americanus	American toad	visual
Rana clamitans	green frog	visual
Rana pipiens	northern leopard frog	visual
Birds		
Ardea herodias	great blue heron	visual
Buteo jamaicensis	red-tailed hawk	visual
Corvus brachyrhynchos	American crow	visual
Geothlypis trichas	common yellowthroat	visual
Meleagris gallopavo	wild turkey	visual
Mammals		
Odocoileus virginianus	whitetail deer	tracks

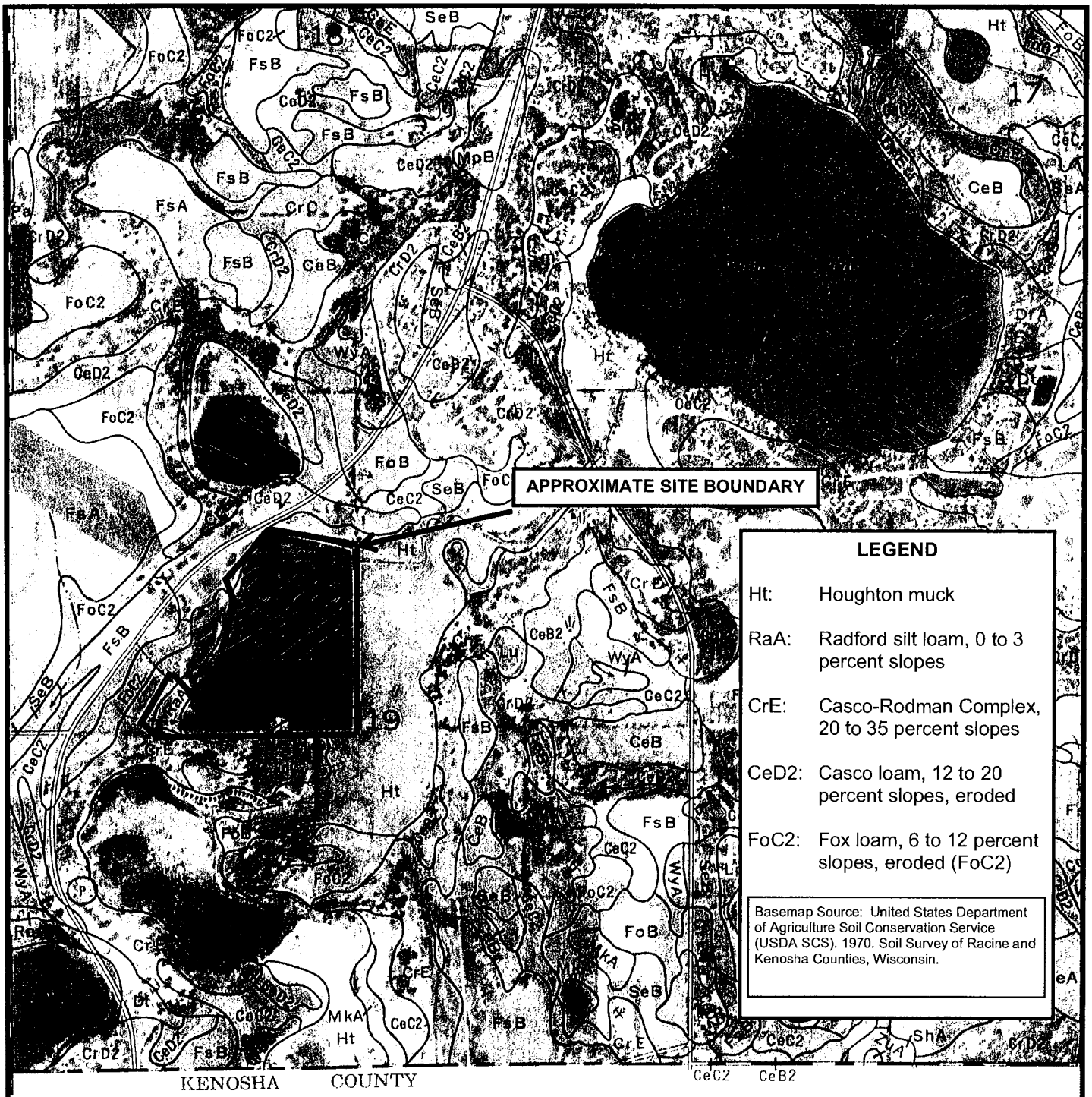


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WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

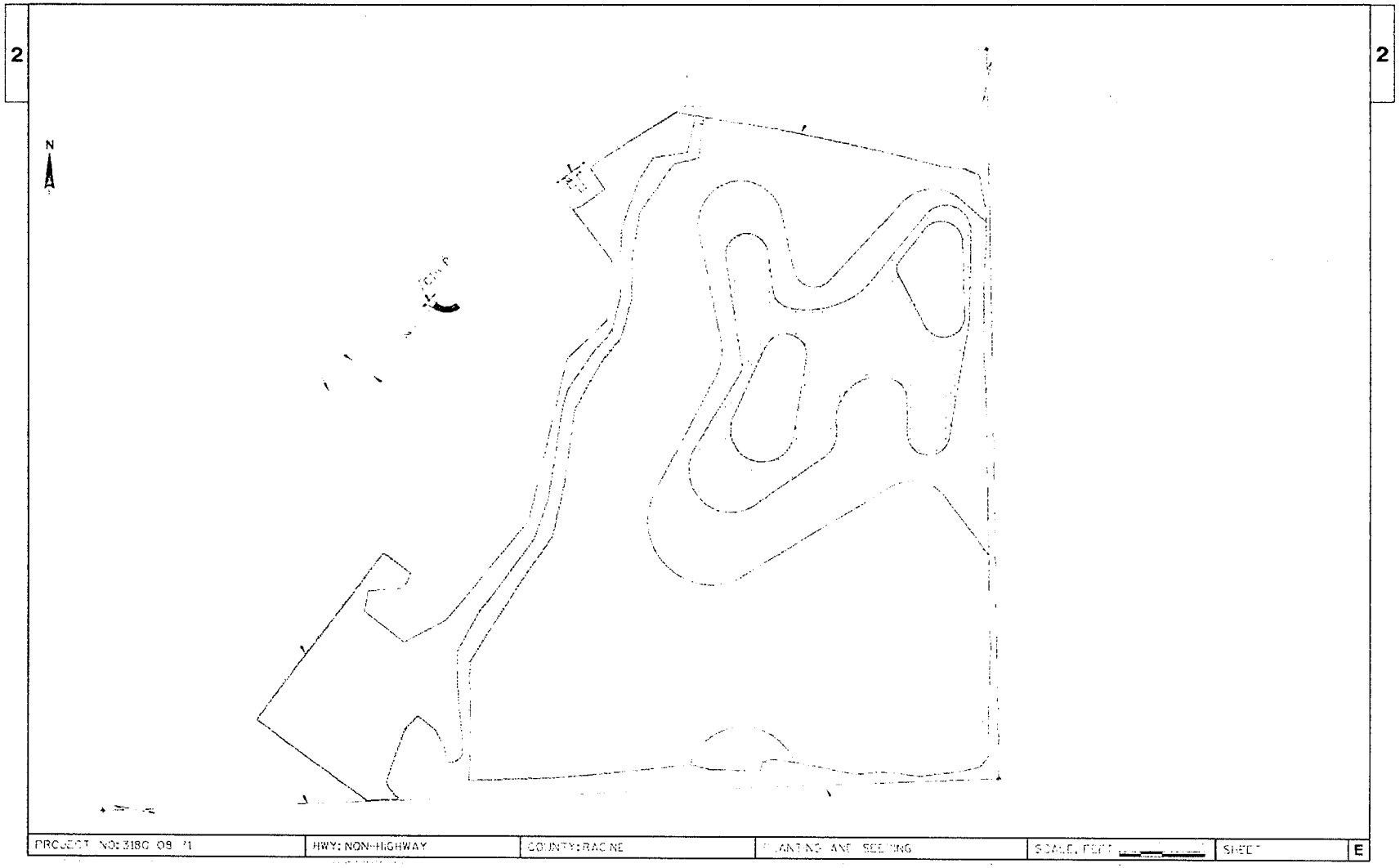
FIGURE 1: PROJECT LOCATION

FILE NAME: FIGURE_05.DWG



TN & A T N & Associates, Inc. Engineering and Science	CITY OF BURLINGTON BYPASS WETLAND MITIGATION - BAUMEISTER FARM PROJECT ID 3180-08-01/3180-08-71	FIGURE 2: SOILS MAP

FILE NAME: FIGURE_05.DWG

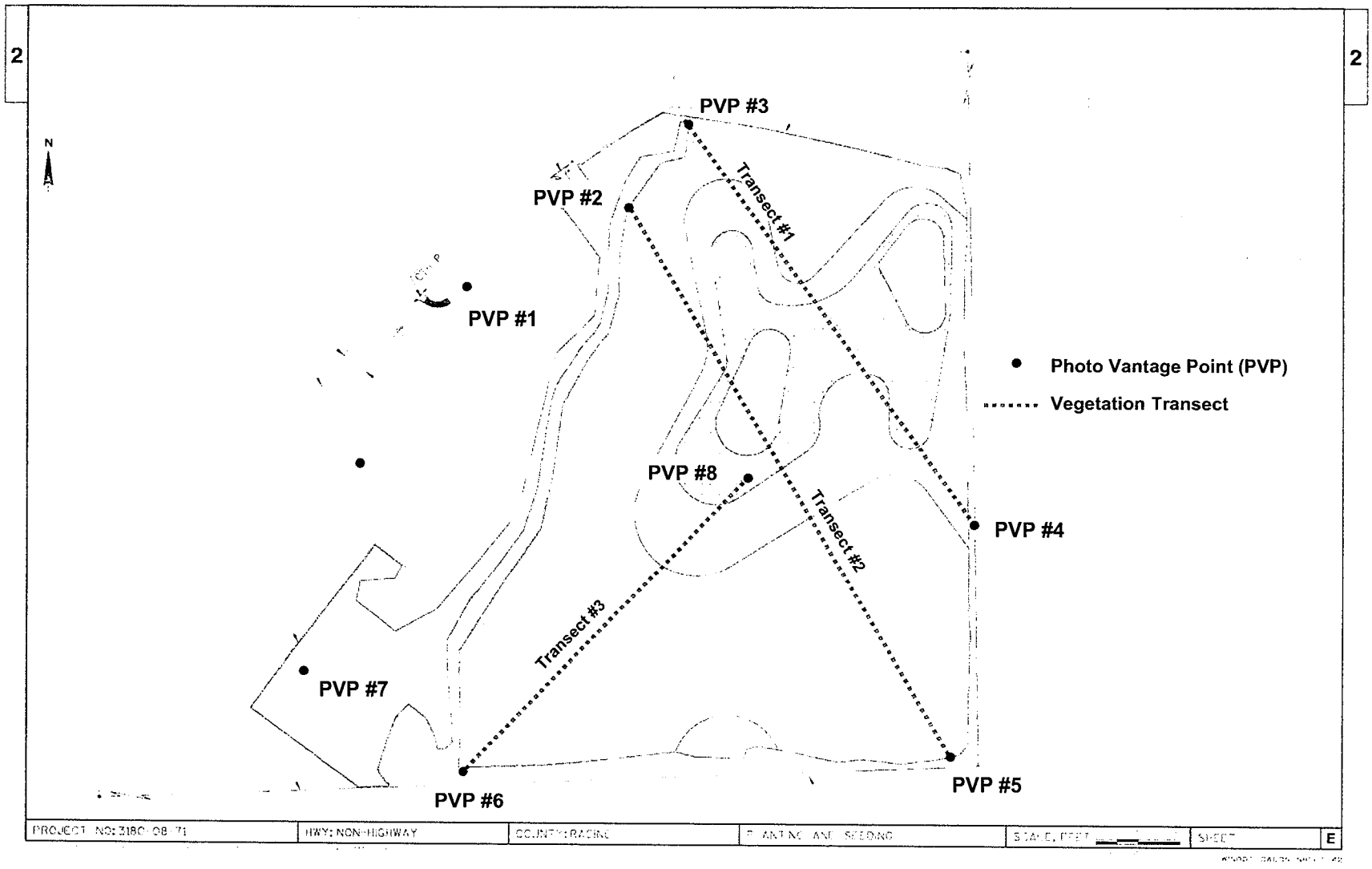


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WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 3:
VEGETATION
PLANTING ZONES

FILE NAME: FIGURE_05.DWG



T N & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 4:
PHOTO VANTAGE POINTS AND VEGETATON TRANSECT LOCATIONS

FILE NAME: FIGURE_05.DWG

Figure 5a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Wetland Indicator Status (2007)

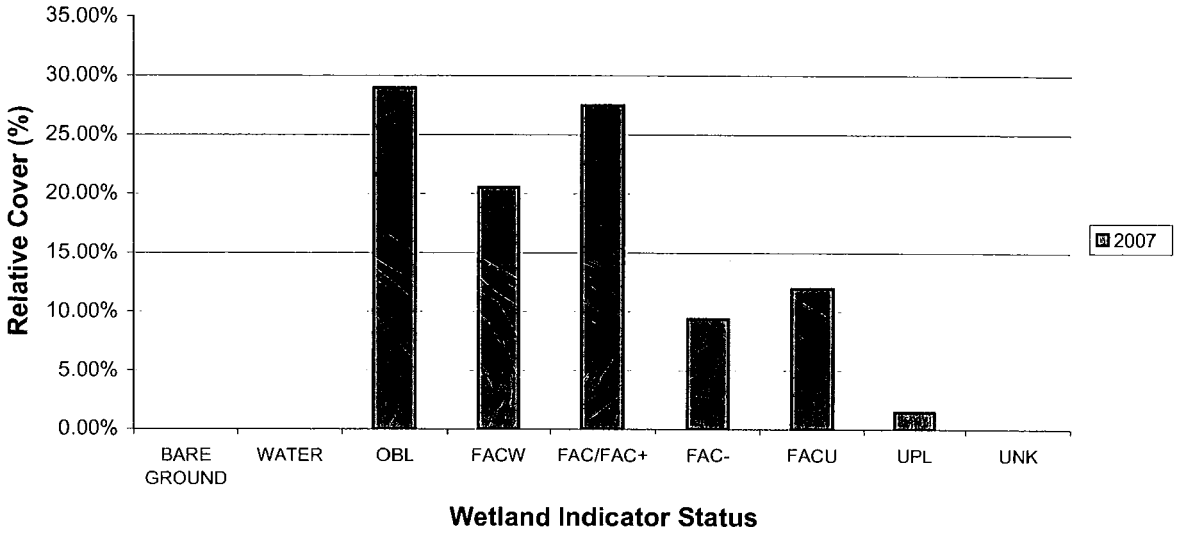


Figure 5b: Vegetation Comparison of the Baumeister Wetland Mitigaiton Site
Relative Frequency vs. Wetland Indicator Status (2007)

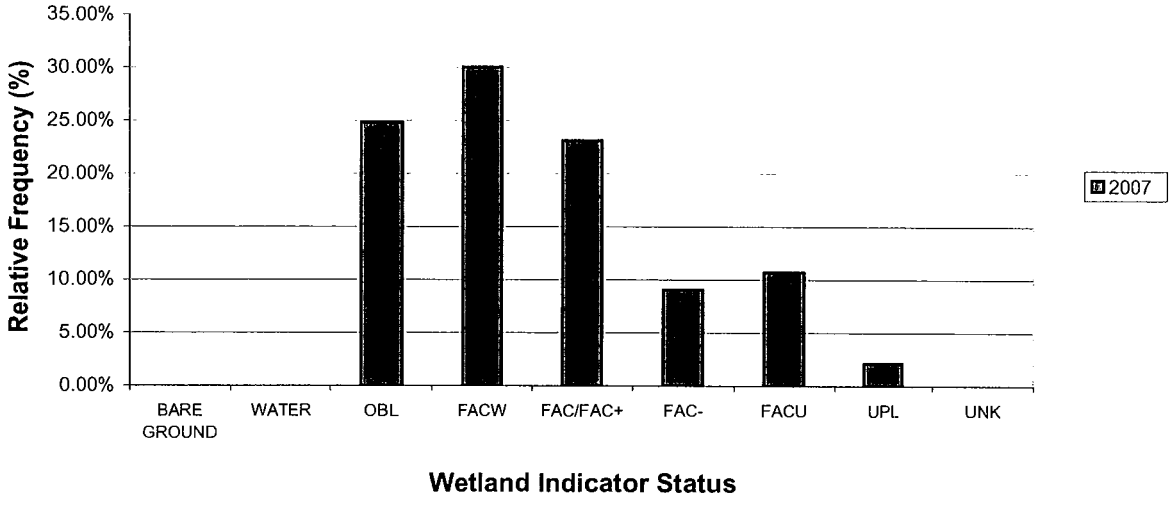


Figure 6a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Origin (2007)

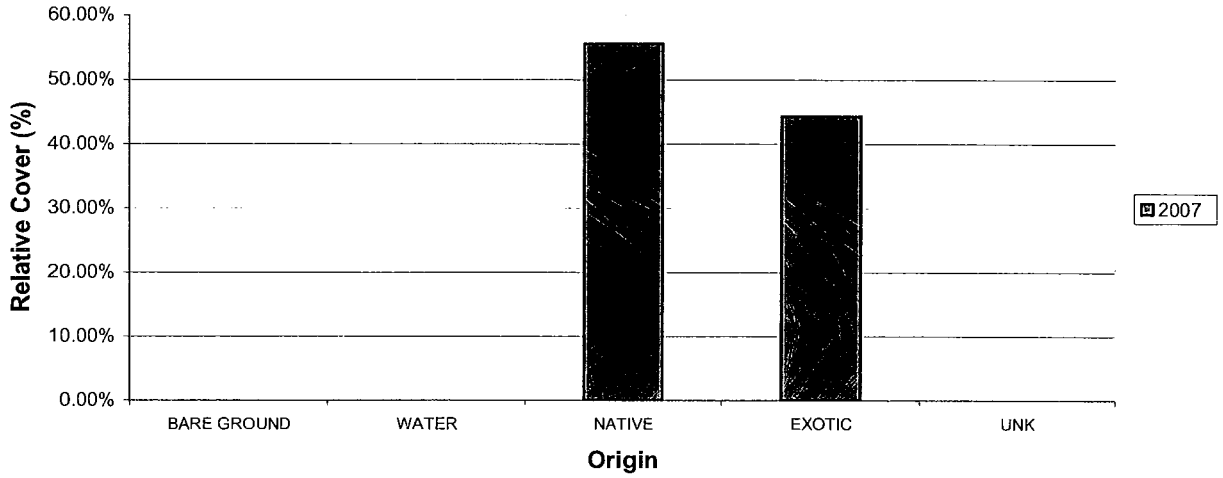


Figure 6b: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Frequency vs. Origin (2007)

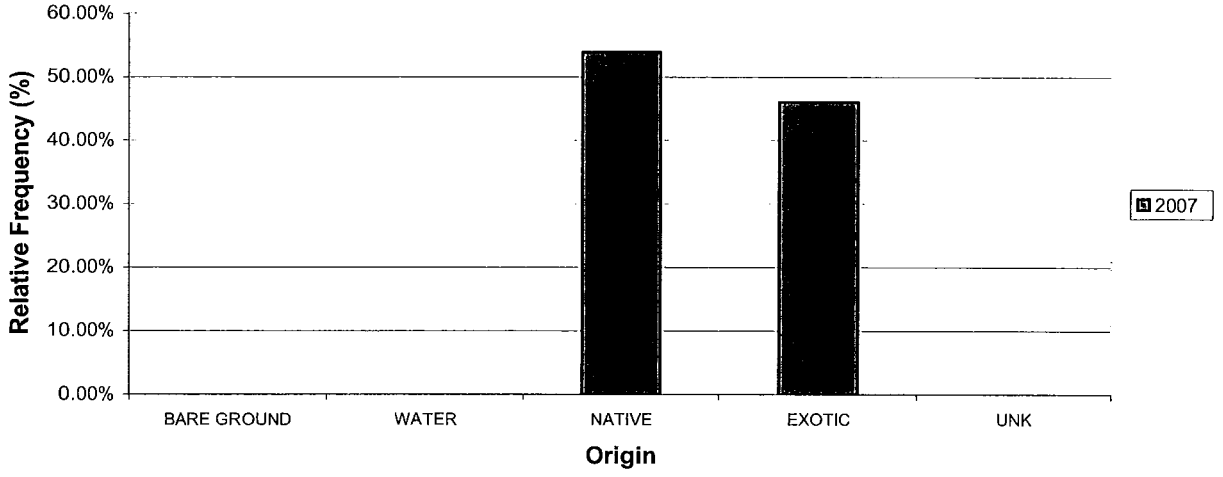


Figure 7
Page 1 of 4

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 1. October 26, 2006, Native seed was mixed with moist sand then placed in a Vortex Seeded.



Photograph 2. October 26, 2006 Native seed, cover crop and sand was mixed then broadcast with a Vortex seeded. The seeded areas were raked / dragged immediately after seeding.

Figure 7
Page 2 of 4

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 3. June 28, 2007; Deep marsh planting zone dominated by rice cut grass, polygonum species and American bur reed.



Photograph 4. June 28, 2007; shallow marsh planting zone dominated by rice cut grass and polygonum species.

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 5. September 19, 2007; edge of the shallow marsh planting zone dominated by foxtail with some river bulrush.



Photograph 6. September 19, 2007; wet meadow planting zone dominated by foxtail, river bulrush and aster species.

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 7. September 19, 2007; wet meadow planting zone, dominated by barnyard grass, foxtail and marsh aster.



Photograph 8. September 19, 2007; wet meadow planting zone, dominated by foxtail and marsh aster.

EXHIBIT 1:
United States Army Corps of Engineers Correspondence

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

COPY

June 8, 2006

REPLY TO
Operations
Regulatory (2006-2807-DJP)

Ms. Barbara Eisenberg
T N & A Associates, Inc.
1033 N. Mayfair Road, Suite 200
Milwaukee, Wisconsin 53226

Dear Mr. Eisenberg:

This is in response to your May 24, 2006, letter requesting Corps concurrence with the compensatory mitigation proposed for the City of Burlington, STH 11 Bypass (WisDOT Project I.D. 3180-08-71). The compensatory mitigation site, also known as Baumeister Farm, is located in the NW ¼, Sec. 19, T. 2N., R. 19E., Racine County, Wisconsin.

We have reviewed the final plans and special provisions provided with your May 24, 2006, letter. The project is designed to retain 3.4 acres of existing wetlands, retain 3.91 acres of existing upland, restore 5.05 acres of upland to tall grass prairie, and to restore approximately 33.12 acres of wetlands within tiled crop land. The project would include the disablement of the existing sub-surface drain tile network and the planting and seeding of the wetland and upland prairie restoration areas. The project is expected to restore 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres or wet meadow, and 5.05 acres of tall grass upland prairie. The initial site preparation would be followed by 5-years of comprehensive monitoring and management to insure that the project's goals, objectives, and success criteria are met. The actual wetland credits available at the site are subject to the results of vegetative survey that would be conducted in the final phase of monitoring that would establish a more precise determination of the types of wetlands actually restored at the site

Based on the information provided, we concur that the "Baumeister Farm" wetland mitigation project would provide wetland restoration that would be adequate to provide compensation mitigation for the unavoidable wetland impacts associated with the Burlington Bypass project.

The decision regarding this action is based on information found in the administrative record, which documents the District's decision-making process, the basis for the decision, and the final decision.

RECEIVED
REGULATORY BRANCH
WAUKESHA

COPY

If you have any questions, contact Dale Pfeiffle in our Waukesha office at (262) 547-0868. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely

Robert J. Whiting
Chief, Regulatory Branch

Copy furnished:

Joanne Kline
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

Karla Leithoff
Wisconsin Department of Transportation
District 2
P.O. Box 798
Waukesha, Wisconsin 53187-0798

EXHIBIT 2:
Construction Plans
for the
Baumeister Wetland Mitigation Site

PROJECT ID: 3180-08-71
WITH:
COUNTY: RACINE

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
Section No.	7	Sign Plates
Section No.	8	Structure Plans
Section No.	9	Computer Earthwork Data
Section No.	9	Cross Sections

TOTAL SHEETS =

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CITY OF BURLINGTON BYPASS

(WETLAND MITIGATION - BAUMEISTER FARM)

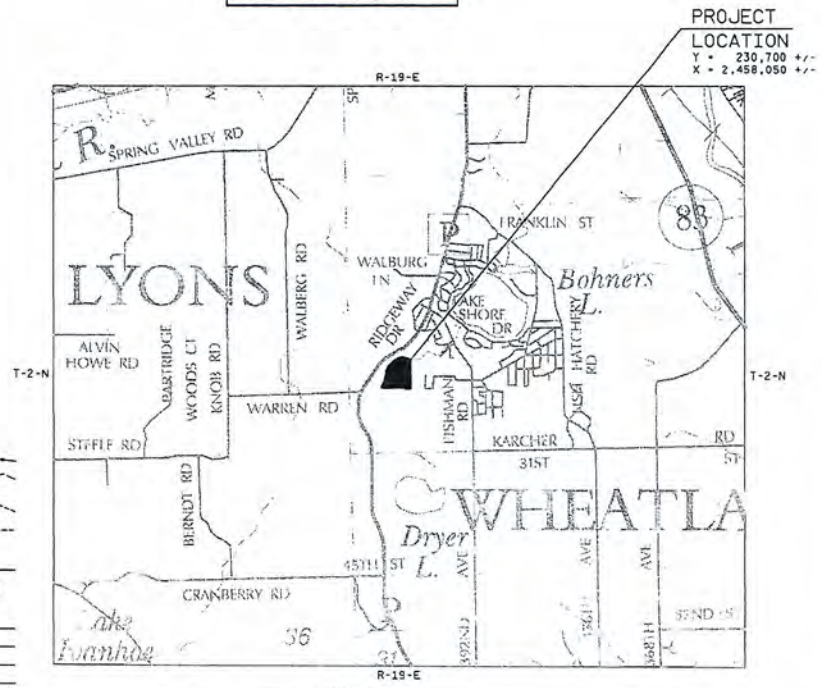
NON-HIGHWAY
RACINE COUNTY

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
3180-08-71		

STATE PROJECT NUMBER
3180-08-71







DESIGN DESIGNATION

A.D.T.	= N/A
A.D.T.	= N/A
D.H.V.	= N/A
D.D.	= N/A
T.	= N/A
DESIGN SPEED	= N/A
ESALS	= N/A

CONVENTIONAL SYMBOLS

PLAN		PROFILE	
CORPORATE LIMITS		GRADE LINE	
PROPERTY LINE		ORIGINAL GROUND	
LOT LINE		MARSH OR ROCK PROFILE (To be noted as such)	ROCK
LIMITED HIGHWAY EASEMENT		SPECIAL DITCH	LABEL
EXISTING RIGHT OF WAY		GRADE ELEVATION	95.36
PROPOSED OR NEW R/W LINE			
SLOPE INTERCEPT		CULVERT (Profile View)	
REFERENCE LINE		UTILITIES	
EXISTING CULVERT		ELECTRIC	E
PROPOSED CULVERT (Box or Pipe)		FIBER OPTIC	FO
		GAS	G
COMBUSTIBLE FLUIDS	CAUTION	SANITARY SEWER	SAN
		STORM SEWER	SS
		TELEPHONE	T
MARSH AREA		WATER	W
		UTILITY PEDESTAL	
		POWER POLE	
WOODED OR SHRUB AREA		TELEPHONE POLE	

LAYOUT
SCALE 0 ½ MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

All coordinates on this plan are ground coordinates, (unless noted X, Y for grid) based on the Wisconsin State Plane Coordinate system (WSPCS) NAD 27 South Zone. To convert ground coordinates (N, E) to Grid Coordinates (Y, X), multiply ground coordinate by a combination factor of 0.99998531 and add 2,000,000 to the X coordinate.

Elevations shown on this plan are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

ORIGINAL PLANS PREPARED BY
TN & A — TN & Associates, Inc.
Engineering and Science

WISCONSIN
JASON R. MATSON
37111
WAUKESHA, WI
PROFESSIONAL ENGINEER

1/30/2006 (Date) (Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY	
Surveyor	WISDOT
Designer	TN & ASSOCIATES
Project Manager	A. SMEJA
District Examiner	K. LEITHOFF
District Supervisor	D. SKORY
C.O. Examiner	

APPROVED FOR DISTRICT OFFICE
DATE 1/30/06 (Signature)

E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\010101_t1.dgn
PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_
WISDOT/CADDS SHEET 10

2

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS, EXCEPT FOR PLANTING ZONES ARE TO BE SEEDED AND MULCHED IMMEDIATELY FOLLOWING COMPLETION OF WORK ACTIVITIES.

TEMPORARY STORAGE OF EQUIPMENT AND MATERIALS IN EXISTING WETLANDS IS NOT PERMITTED UNLESS AUTHORIZED BY THE ENGINEER.

ACCESS TO THE SITE IS PERMITTED ONLY AT THE SITE ACCESS POINTS SHOWN ON THE PLANS. EXACT LOCATION OF THE SITE ACCESS POINTS TO BE DETERMINED BY THE ENGINEER IN THE FIELD. THE SOUTHWESTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE TEMPORARY AND THE NORTHEASTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE PERMANENT.

UTILITIES EXIST ADJACENT TO THE PROJECT AND MAY BE AFFECTED BY THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIGGERS HOTLINE AND ANY UTILITIES IN THE AREA THAT ARE NOT A MEMBER OF DIGGERS HOTLINE.

ALL EROSION CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND ARE TO BE INSTALLED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.

OTHER AGENCIES

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HIGHWAY ENGINEERING DIRECTOR
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BURLINGTON, WI 53105
PHONE: (262) 763-3070
FAX: (262) 763-2118
ASTREIF@TOWNOFBURLINGTON.COM

DISTRICT DNR AREA LIAISON

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WISCONSIN DEPARTMENT OF NATURAL RESOURCES
SOUTHEAST REGION - MILWAUKEE SERVICE CENTER
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MILWAUKEE, WI 53212
PHONE: (414) 263-8756

UTILITY CONTACTS

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FAX: (414) 221-2336
DAN.SANDE@WE-ENERGIES.COM

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DAN.SANDE@WE-ENERGIES.COM

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LAWRENCE.HUBER@ELPASO.COM

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TK6192@SBC.COM

MR. HARVEY KANDLER, PRESIDENT
BOHNERS LAKE SANITARY DISTRICT
32288 BUSHNELL ROAD
BURLINGTON, WI 53105
PHONE: (252) 210-1046

* MR. JOHN LUBNIEWSKI
TDS TELECOM
525 JUNCTION ROAD, SUITE 6000
PO BOX 5158
MADISON, WI 53705 0158
PHONE: (608) 664-4413
FAX: (608) 664-4498

* MR. STEVE CRAMER, UTILITY COORDINATOR
TIME WARNER CABLE
1320 NORTH MARTIN LUTHER KING JR. DRIVE
MILWAUKEE, WI 53212
PHONE: (414) 277-4045
FAX: (414) 277-0638
STEVE.CRAMER@TWCABLE.COM

* MR. ANDY EBERHARDT, RE/ROW REPRESENTATIVE
ATC MANAGEMENT, INC.
N19 W23993 RIDGEVIEW PARKWAY WEST
PO BOX 47
WAUKESHA, WI 53187 0047
PHONE: (262) 506-6864
FAX: (262) 506-6711
AEBERHARDT@ATCLLC.COM

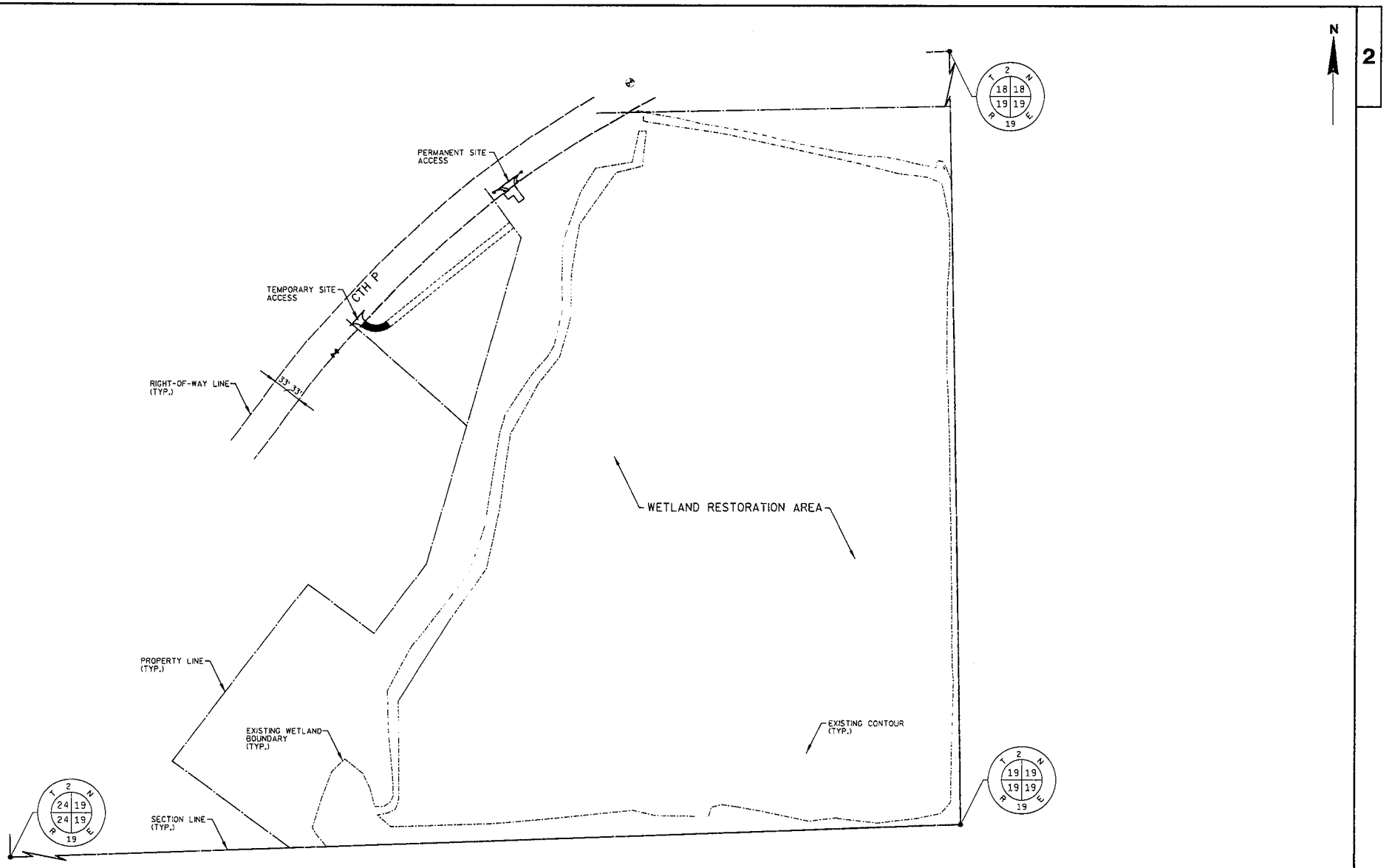
* MEMBER OF DIGGERS HOTLINE

STANDARD DETAIL DRAWINGS

8E9-6	SILT FENCE
14B15-4c	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-4b	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B18-4c	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
15D29-1	TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD

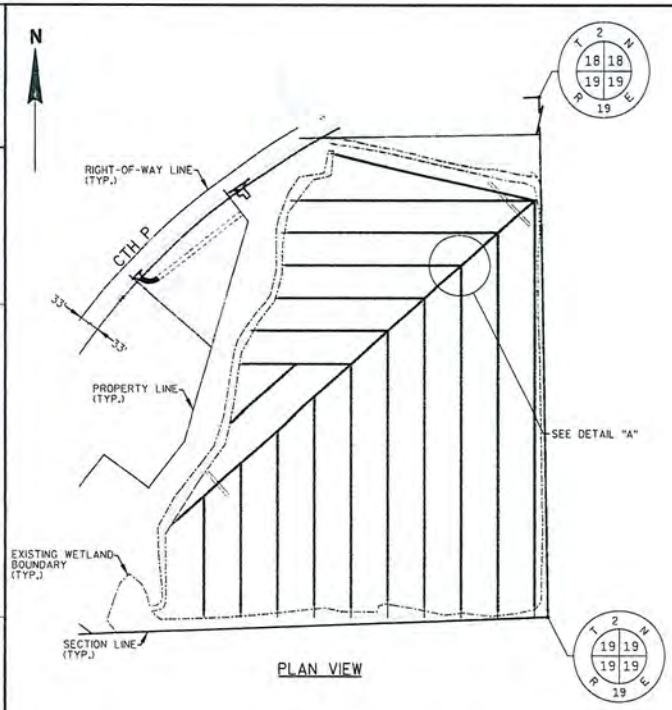
DIGGERS HOTLINE

Toll Free (800) 242-8511
Milwaukee Area (414) 259-1181
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com

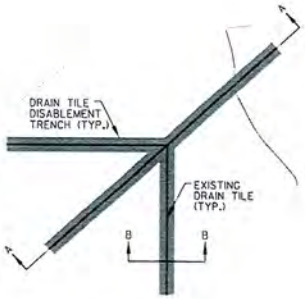


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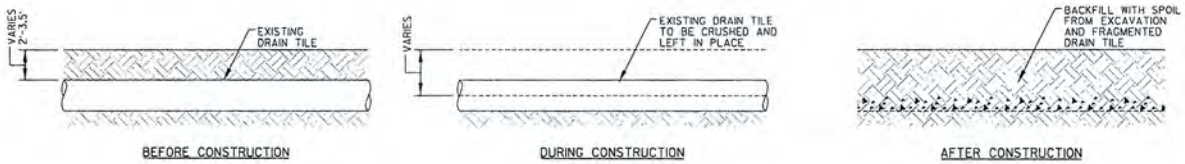
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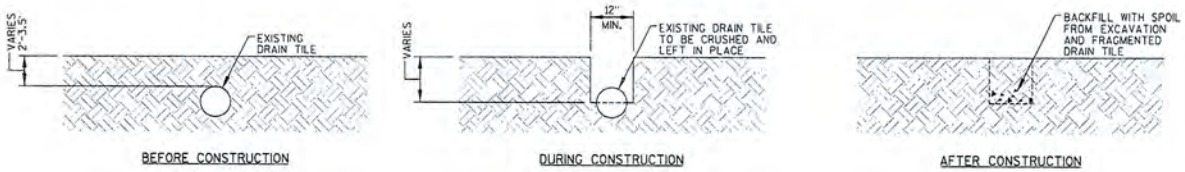
PLAN VIEW



DETAIL "A"



SECTION A-A



SECTION B-B

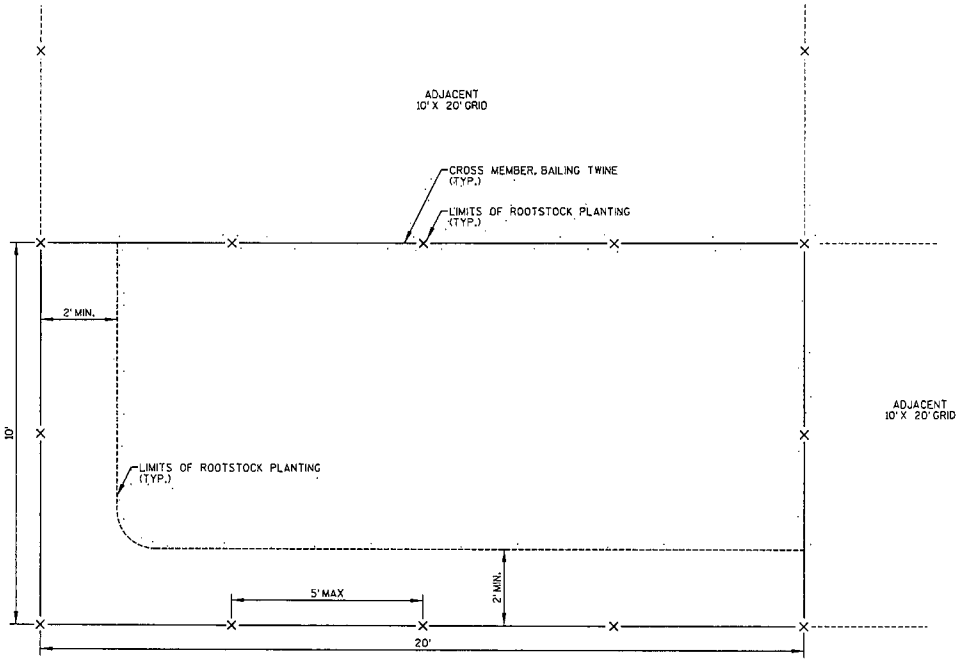
NOTES:

1. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
2. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
3. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
4. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
5. SEE DRAIN TILE DISABLEMENT PLAN SHEET FOR ADDITIONAL INFORMATION.

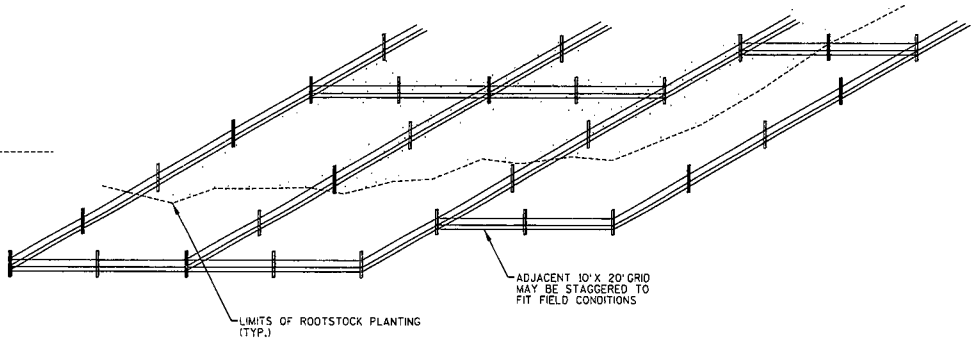
DRAIN TILE DISABLEMENT DETAIL
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

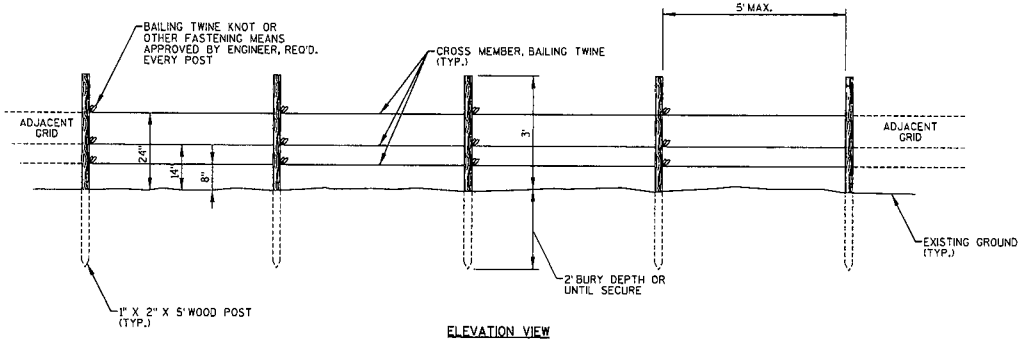
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PLAN VIEW



ISOMETRIC VIEW

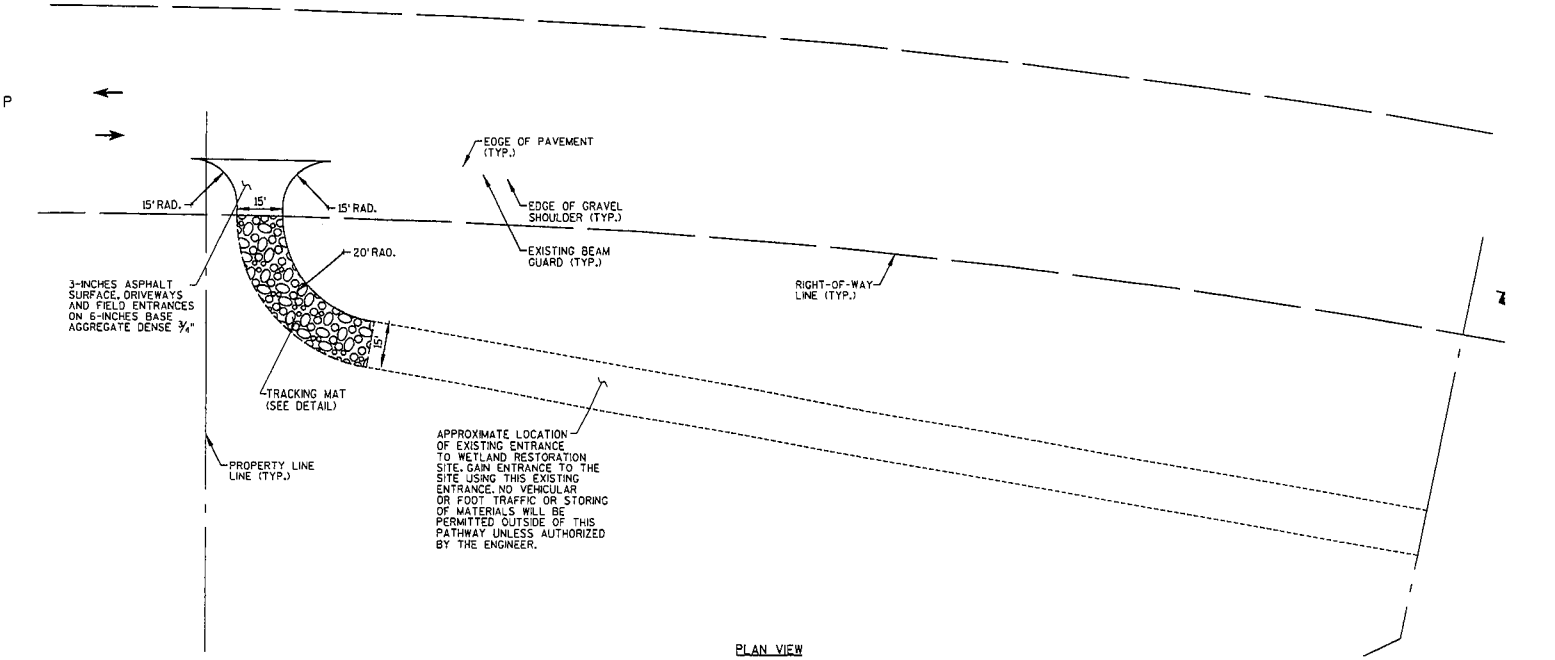


ELEVATION VIEW

ROOTSTOCK PROTECTION DETAIL
N.T.S.

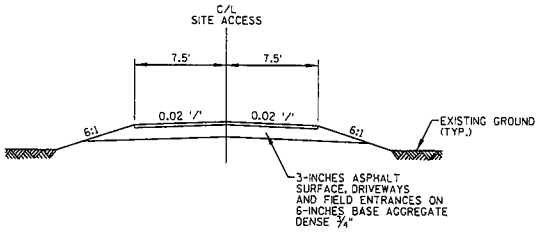
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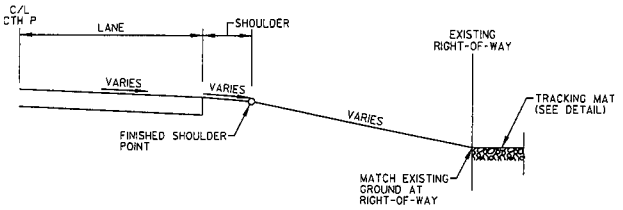


PLAN VIEW

NOTE: ALL TOPSOIL STRIPPED TO CONSTRUCT THE TEMPORARY SITE ACCESS POINT AND TRACKING PAD IS TO BE PLACED IN A NEAT PILE ON SITE WITH THE PROJECT MANAGER'S APPROVAL. THE PILE SHOULD BE NEAR THE ENTRANCE FOR THE TEMPORARY SITE ACCESS POINT AND WILL BE REMOVED BY OTHERS.



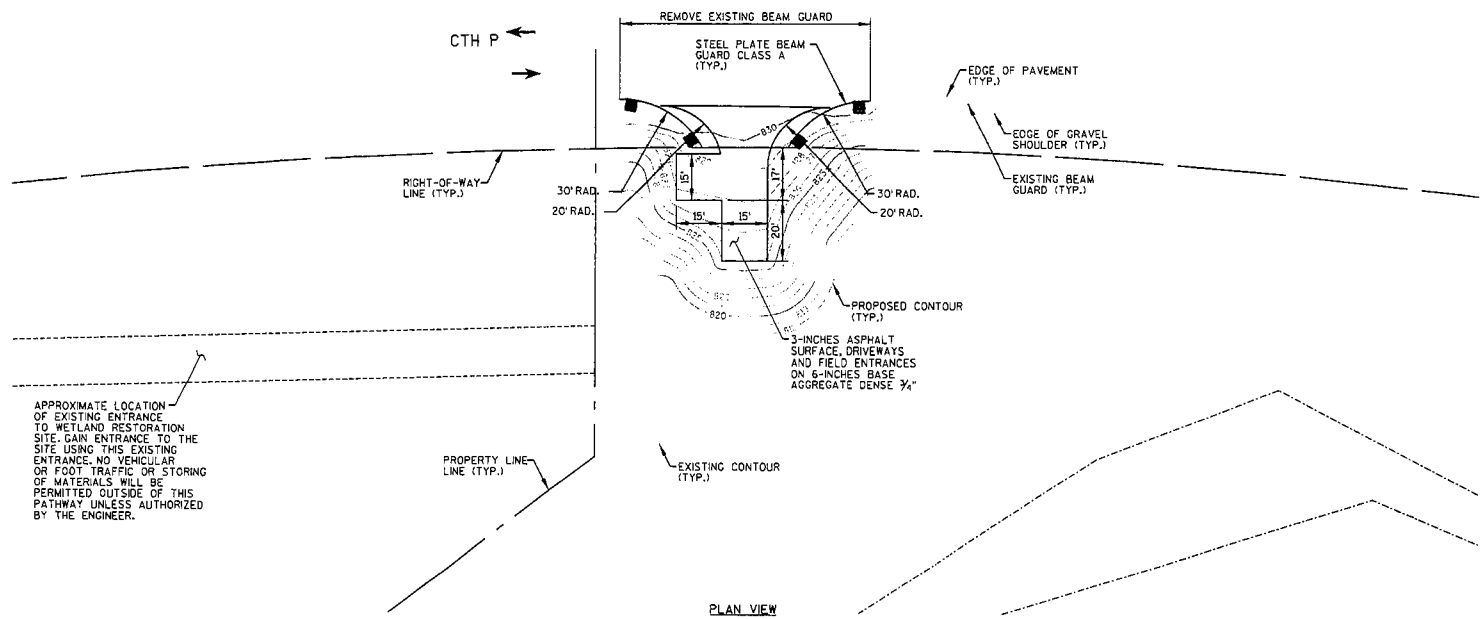
INSIDE RIGHT-OF-WAY CROSS SECTION



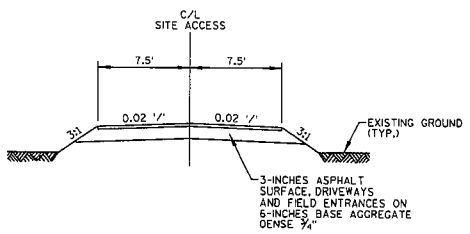
PROFILE

TEMPORARY SITE ACCESS POINT
CTH P
N.T.S.

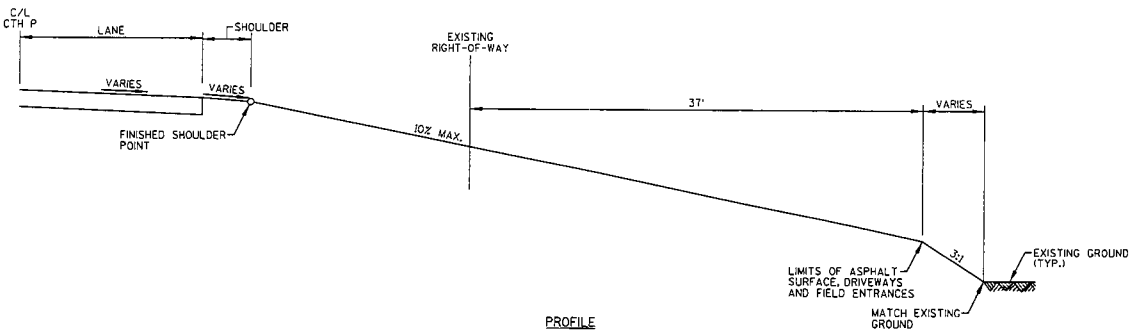
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



PLAN VIEW



CROSS SECTION

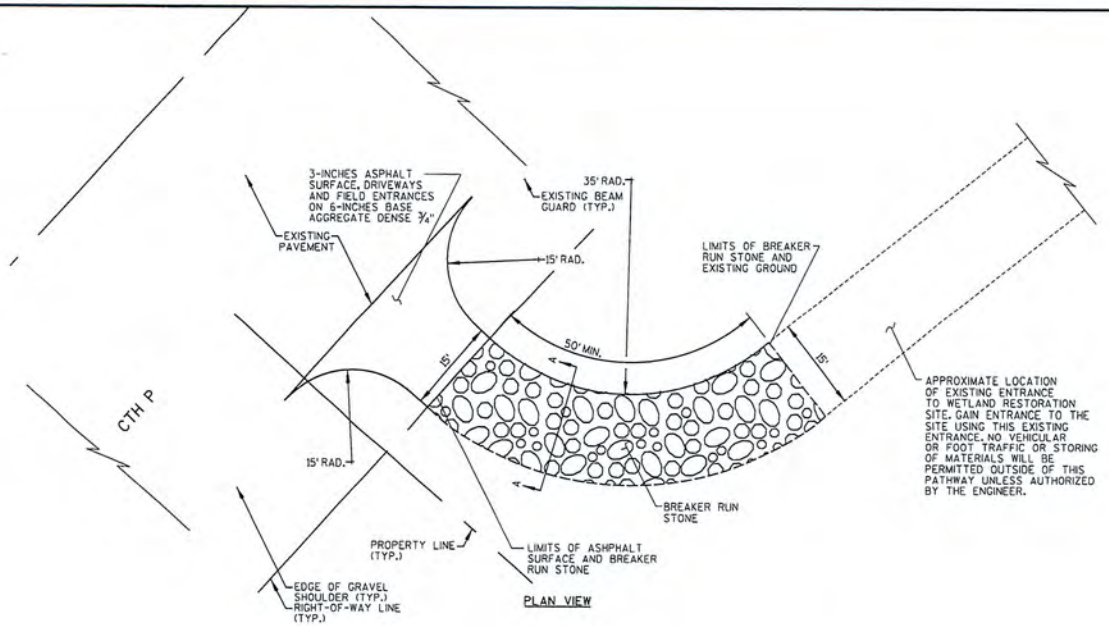


PROFILE

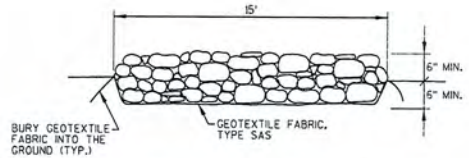
PERMANENT SITE ACCESS POINT
CTH P
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\021004_cd.dgn
PLOT DATE : 1/27/2006
PLOT BY : TNA
PLOT NAME :
PLOT SCALE : _PLOTSCALE_
WISDOT/CADDS SHEET 42



PLAN VIEW



NOTE: TRACKING MATS SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

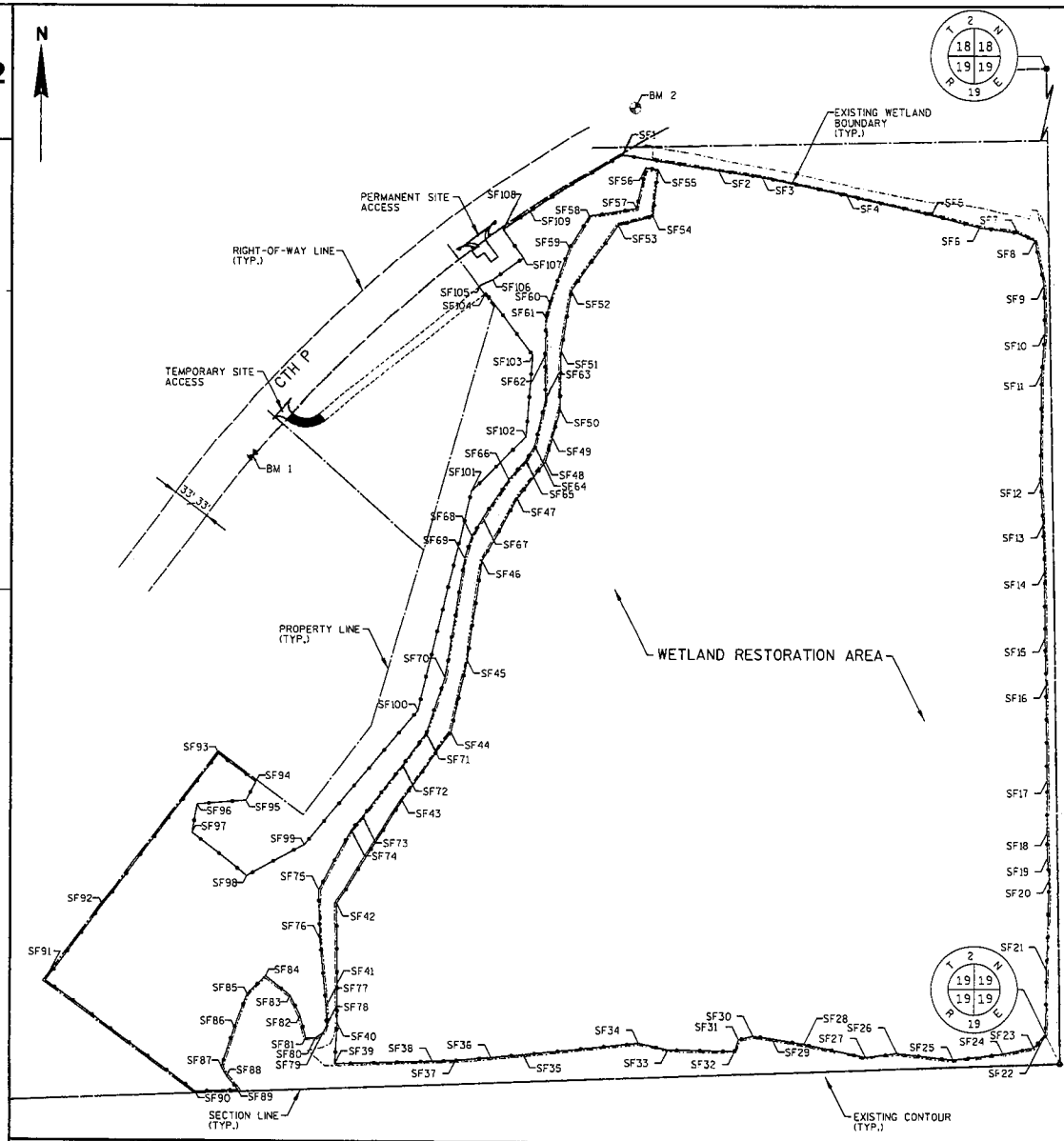
TRACKING MAT TO REMAIN IN PLACE AFTER CONSTRUCTION IS COMPLETED.

SECTION A-A

TRACKING MAT
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

FILE NAME : P:\2005 Projects\2005108 - Baumeister\MicroStation\Planset\021005_cd.dgn
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WISDOT/CADDS SHEET 42



EROSION CONTROL LEGEND

SILT FENCE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP "89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

SILT FENCE COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING
SF1	231,543.42	457,929.44
SF2	231,517.12	458,095.08
SF3	231,505.21	458,170.12
SF4	231,473.33	458,316.97
SF5	231,439.93	458,463.06
SF6	231,418.22	458,545.91
SF7	231,409.59	458,611.65
SF8	231,396.58	458,641.64
SF9	231,319.99	458,657.24
SF10	231,238.72	458,659.15
SF11	231,168.35	458,653.66
SF12	230,987.72	458,652.26
SF13	230,912.85	458,656.46
SF14	230,829.93	458,659.30
SF15	230,713.49	458,660.70
SF16	230,634.05	458,662.68
SF17	230,469.27	458,665.13
SF18	230,380.06	458,665.61
SF19	230,336.08	458,666.38
SF20	230,300.15	458,669.26
SF21	230,143.63	458,665.43
SF22	230,032.89	458,664.32
SF23	230,009.64	458,644.20
SF24	229,998.17	458,591.35
SF25	229,987.72	458,505.33
SF26	229,998.12	458,408.31
SF27	229,990.96	458,353.95
SF28	230,013.28	458,247.24
SF29	230,022.41	458,192.14
SF30	230,027.01	458,159.10
SF31	230,020.41	458,134.35
SF32	230,000.37	458,128.08
SF33	230,002.05	458,012.42
SF34	230,013.49	457,962.30
SF35	229,992.26	457,764.14
SF36	229,986.93	457,708.56
SF37	229,981.69	457,647.41
SF38	229,980.30	457,607.74
SF39	229,974.49	457,440.80
SF40	230,045.10	457,444.56
SF41	230,113.97	457,444.18
SF42	230,253.11	457,442.15
SF43	230,429.51	457,554.29
SF44	230,548.16	457,637.40
SF45	230,672.43	457,664.99
SF46	230,845.54	457,689.57
SF47	230,852.73	457,749.60
SF48	231,015.50	457,798.28
SF49	231,055.57	457,810.30
SF50	231,105.34	457,823.26
SF51	231,204.65	457,824.96
SF52	231,309.21	457,842.26
SF53	231,421.13	457,922.98
SF54	231,436.39	457,982.52
SF55	231,518.44	457,991.10
SF56	231,521.81	457,969.89
SF57	231,449.97	457,954.15
SF58	231,436.74	457,873.32
SF59	231,381.35	457,838.84
SF60	231,288.57	457,804.69
SF61	231,259.99	457,798.50
SF62	231,196.88	457,797.43
SF63	231,119.74	457,797.78
SF64	231,041.68	457,779.73
SF65	231,017.11	457,764.40
SF66	230,984.60	457,735.12
SF67	230,920.17	457,690.98
SF68	230,889.45	457,671.72
SF69	230,849.16	457,659.75
SF70	230,642.16	457,627.10
SF71	230,545.65	457,595.34
SF72	230,490.31	457,554.80
SF73	230,401.05	457,486.87
SF74	230,378.34	457,467.42
SF75	230,276.87	457,411.75
SF76	230,191.55	457,413.98
SF77	230,068.71	457,425.55
SF78	230,039.41	457,426.02
SF79	230,028.36	457,420.49
SF80	230,018.92	457,407.66
SF81	230,019.03	457,390.48
SF82	230,056.42	457,380.83
SF83	230,091.61	457,363.64
SF84	230,126.68	457,321.02
SF85	230,094.53	457,289.72
SF86	230,036.89	457,258.27
SF87	229,968.03	457,246.60
SF88	229,952.07	457,255.58
SF89	229,928.86	457,274.95
SF90	229,925.94	457,201.35
SF91	230,116.29	456,943.25
SF92	230,247.76	457,040.85
SF93	230,508.77	457,239.18
SF94	230,460.49	457,303.48
SF95	230,428.09	457,286.55
SF96	230,421.34	457,203.25
SF97	230,372.96	457,194.55
SF98	230,299.46	457,287.84
SF99	230,352.29	457,386.54
SF100	230,584.88	457,580.73
SF101	230,964.62	457,671.02
SF102	231,057.15	457,764.62
SF103	231,197.57	457,776.26
SF104	231,305.75	457,694.75
SF105	231,317.74	457,685.71
SF106	231,326.80	457,707.45
SF107	231,364.19	457,759.93
SF108	231,413.31	457,724.94
SF109	231,445.42	457,771.19

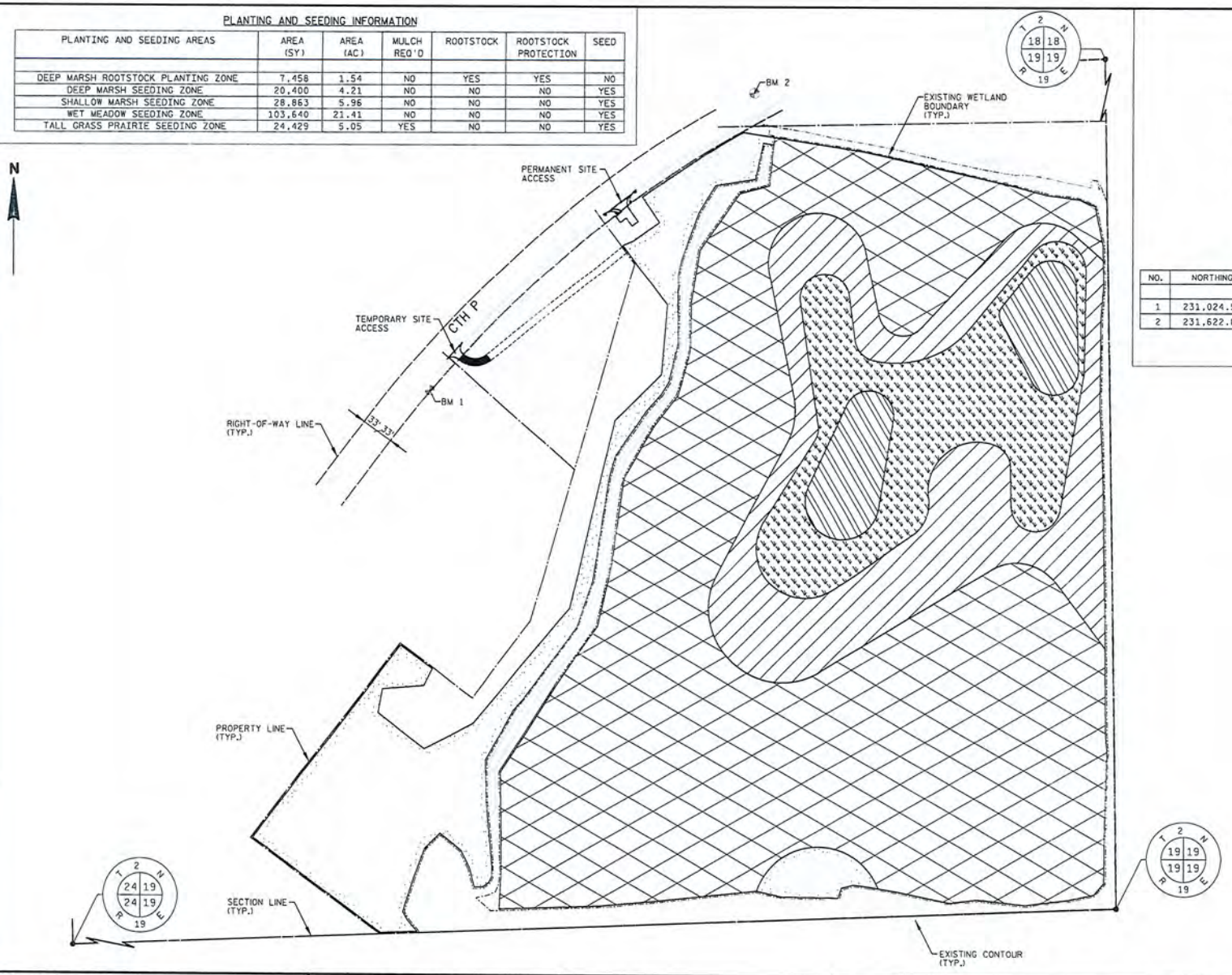
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	EROSION CONTROL	SCALE, FEET 0 100 200	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\022001_ec.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

WISDOT/CADDS SHEET 42

PLANTING AND SEEDING INFORMATION

PLANTING AND SEEDING AREAS	AREA (SY)	AREA (AC)	MULCH REQ'D	ROOTSTOCK	ROOTSTOCK PROTECTION	SEED
DEEP MARSH ROOTSTOCK PLANTING ZONE	7,458	1.54	NO	YES	YES	NO
DEEP MARSH SEEDING ZONE	20,400	4.21	NO	NO	NO	YES
SHALLOW MARSH SEEDING ZONE	28,863	5.96	NO	NO	NO	YES
WET MEADOW SEEDING ZONE	103,640	21.41	NO	NO	NO	YES
TALL GRASS PRAIRIE SEEDING ZONE	24,429	5.05	YES	NO	NO	YES



PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP "89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

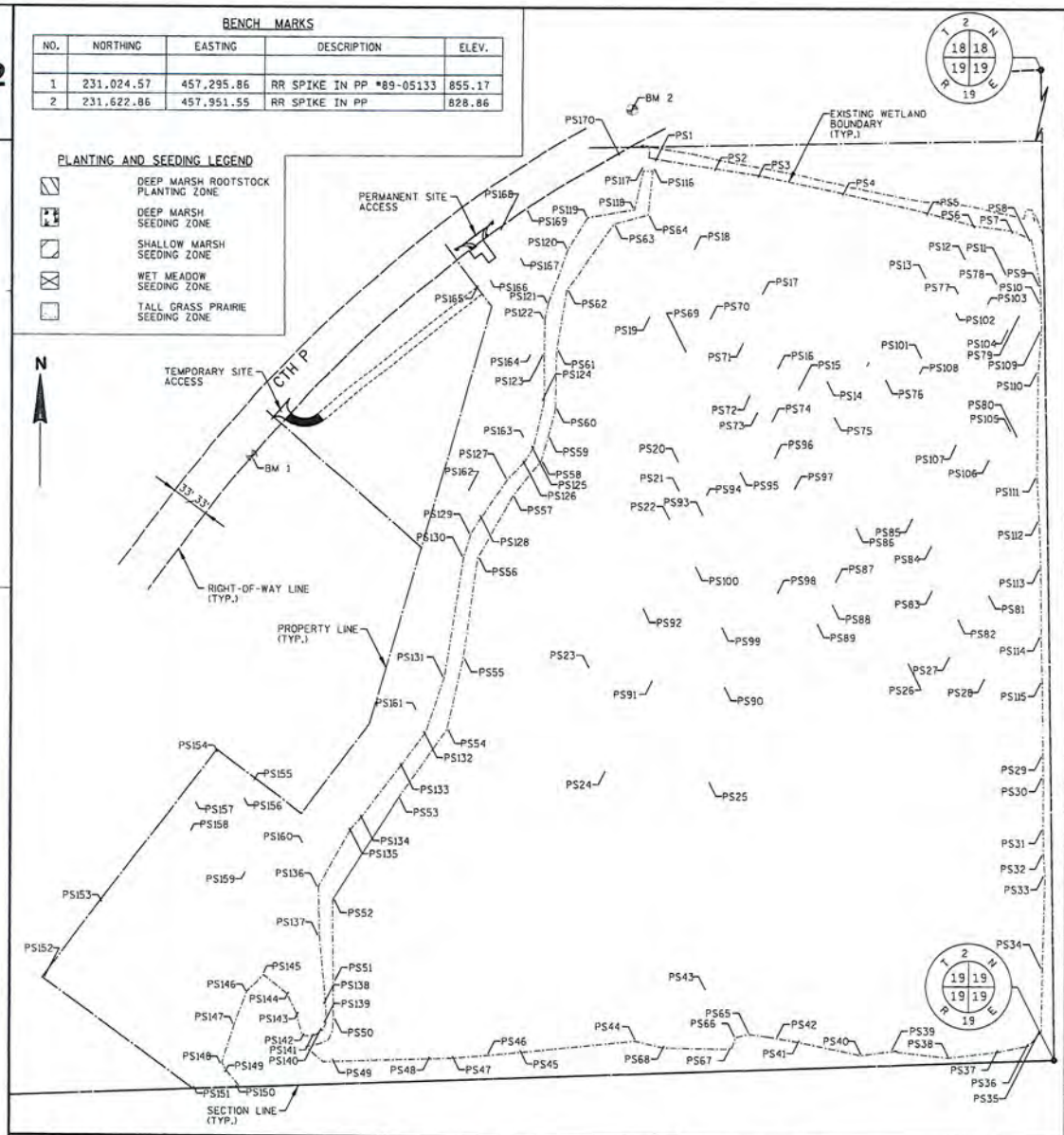
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PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP *89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

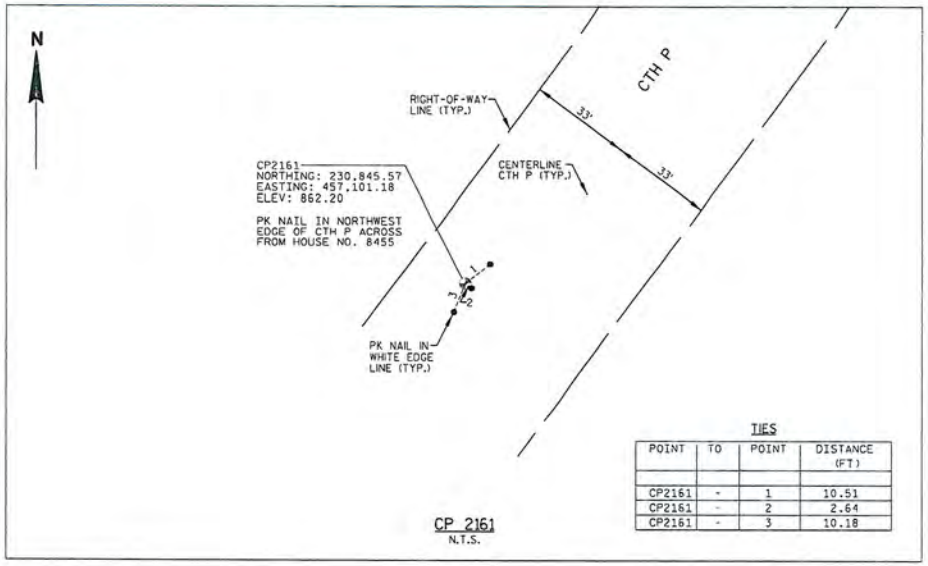


PLANTING AND SEEDING COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING	POINT NUMBER	NORTHING	EASTING
PS1	231,533.38	457,992.66	PS86	230,899.66	458,342.10
PS2	231,517.12	458,095.08	PS87	230,807.67	458,306.66
PS3	231,505.21	458,170.12	PS88	230,766.85	458,301.31
PS4	231,473.33	458,316.97	PS89	230,735.00	458,275.22
PS5	231,439.93	458,463.06	PS90	230,624.51	458,114.67
PS6	231,418.22	458,545.91	PS91	230,634.59	457,988.90
PS7	231,409.59	458,611.65	PS92	230,759.77	457,973.11
PS8	231,396.58	458,641.64	PS93	230,923.00	458,075.36
PS9	231,319.99	458,657.24	PS94	230,956.95	458,082.44
PS10	231,289.40	458,657.96	PS95	230,991.03	458,140.36
PS11	231,340.06	458,599.81	PS96	231,023.77	458,200.39
PS12	231,364.64	458,528.92	PS97	230,967.94	458,235.06
PS13	231,333.00	458,460.89	PS98	230,787.99	458,205.89
PS14	231,151.42	458,290.85	PS99	230,728.40	458,109.87
PS15	231,137.46	458,240.81	PS100	230,831.60	458,063.81
PS16	231,175.46	458,205.39	PS101	231,193.95	458,453.74
PS17	231,303.66	458,178.31	PS102	231,270.54	458,514.14
PS18	231,380.89	458,060.08	PS103	231,287.06	458,569.10
PS19	231,262.89	457,982.51	PS104	231,241.02	458,603.38
PS20	231,016.60	458,032.72	PS105	231,069.80	458,608.77
PS21	230,964.60	458,034.18	PS106	231,019.97	458,571.36
PS22	230,915.22	458,017.79	PS107	231,045.30	458,514.43
PS23	230,657.99	457,879.45	PS108	231,167.05	458,451.13
PS24	230,478.01	457,908.13	PS109	231,238.72	458,659.15
PS25	230,458.56	458,089.34	PS110	231,168.35	458,653.66
PS26	230,666.25	458,433.20	PS111	230,987.72	458,652.26
PS27	230,678.78	458,504.15	PS112	230,912.85	458,656.46
PS28	230,640.37	458,565.11	PS113	230,829.93	458,659.30
PS29	230,506.77	458,664.57	PS114	230,713.49	458,660.70
PS30	230,469.27	458,665.13	PS115	230,634.05	458,662.68
PS31	230,380.06	458,665.61	PS116	231,518.44	457,991.10
PS32	230,336.08	458,666.38	PS117	231,521.81	457,969.89
PS33	230,300.15	458,669.26	PS118	231,449.97	457,954.15
PS34	230,143.63	458,665.43	PS119	231,436.74	457,873.32
PS35	230,032.89	458,664.32	PS120	231,381.35	457,838.84
PS36	230,009.64	458,644.20	PS121	231,288.57	457,804.69
PS37	229,998.17	458,591.35	PS122	231,259.99	457,798.50
PS38	229,987.72	458,505.33	PS123	231,196.88	457,797.43
PS39	229,998.12	458,408.31	PS124	231,119.74	457,797.78
PS40	229,990.96	458,353.95	PS125	231,041.68	457,779.73
PS41	230,013.28	458,247.24	PS126	231,017.11	457,764.40
PS42	230,019.63	458,208.90	PS127	230,984.60	457,735.12
PS43	230,102.06	458,083.47	PS128	230,920.17	457,690.98
PS44	230,013.49	457,962.30	PS129	230,889.45	457,671.72
PS45	229,992.26	457,764.14	PS130	230,849.16	457,659.75
PS46	229,986.93	457,708.56	PS131	230,642.16	457,627.10
PS47	229,981.69	457,647.41	PS132	230,545.65	457,595.34
PS48	229,980.30	457,607.74	PS133	230,490.31	457,554.80
PS49	229,974.49	457,440.80	PS134	230,401.05	457,486.87
PS50	230,045.10	457,444.56	PS135	230,378.34	457,467.42
PS51	230,113.97	457,444.18	PS136	230,276.87	457,411.75
PS52	230,253.11	457,442.15	PS137	230,191.55	457,413.98
PS53	230,429.51	457,554.29	PS138	230,068.71	457,425.55
PS54	230,548.16	457,637.40	PS139	230,039.41	457,426.02
PS55	230,672.43	457,664.99	PS140	230,028.36	457,420.49
PS56	230,845.54	457,689.57	PS141	230,018.91	457,407.66
PS57	230,952.73	457,749.60	PS142	230,019.03	457,390.48
PS58	231,015.50	457,798.28	PS143	230,056.42	457,380.83
PS59	231,055.57	457,810.30	PS144	230,091.61	457,363.64
PS60	231,105.34	457,823.26	PS145	230,126.68	457,321.02
PS61	231,204.65	457,824.96	PS146	230,094.53	457,289.72
PS62	231,309.21	457,842.26	PS147	230,036.89	457,268.27
PS63	231,421.13	457,922.98	PS148	229,968.03	457,246.60
PS64	231,436.39	457,982.52	PS149	229,952.07	457,255.58
PS65	230,027.01	458,159.10	PS150	229,928.86	457,274.95
PS66	230,020.41	458,134.35	PS151	229,925.94	457,201.35
PS67	230,000.37	458,128.08	PS152	230,116.29	456,943.25
PS68	230,002.05	458,012.42	PS153	230,247.76	457,040.85
PS69	231,203.36	458,045.55	PS154	230,508.77	457,239.18
PS70	231,260.26	458,087.95	PS155	230,460.49	457,303.48
PS71	231,217.46	458,144.55	PS156	230,428.09	457,286.55
PS72	231,127.99	458,156.65	PS157	230,421.34	457,203.25
PS73	231,100.76	458,169.48	PS158	230,372.96	457,194.55
PS74	231,085.82	458,195.62	PS159	230,299.46	457,287.84
PS75	231,092.38	458,303.61	PS160	230,352.29	457,386.54
PS76	231,154.21	458,392.39	PS161	230,584.88	457,580.73
PS77	231,305.77	458,517.10	PS162	230,964.62	457,671.02
PS78	231,323.78	458,584.10	PS163	231,057.15	457,764.62
PS79	231,266.53	458,623.30	PS164	231,197.57	457,776.26
PS80	231,059.59	458,619.94	PS165	231,317.74	457,685.71
PS81	230,784.46	458,572.68	PS166	231,326.80	457,707.45
PS82	230,742.87	458,519.50	PS167	231,364.19	457,759.93
PS83	230,792.16	458,473.37	PS168	231,413.31	457,724.94
PS84	230,869.93	458,472.39	PS169	231,445.42	457,771.19
PS85	230,916.56	458,439.22	PS170	231,543.42	457,929.44

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

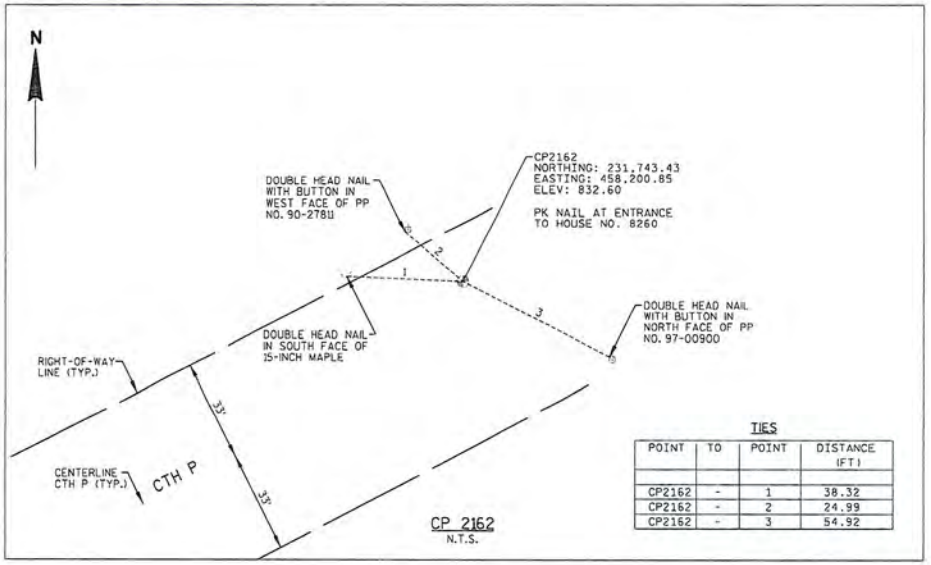
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PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_



TIES

POINT	TO	POINT	DISTANCE (FT)
CP2161	-	1	10.51
CP2161	-	2	2.64
CP2161	-	3	10.18

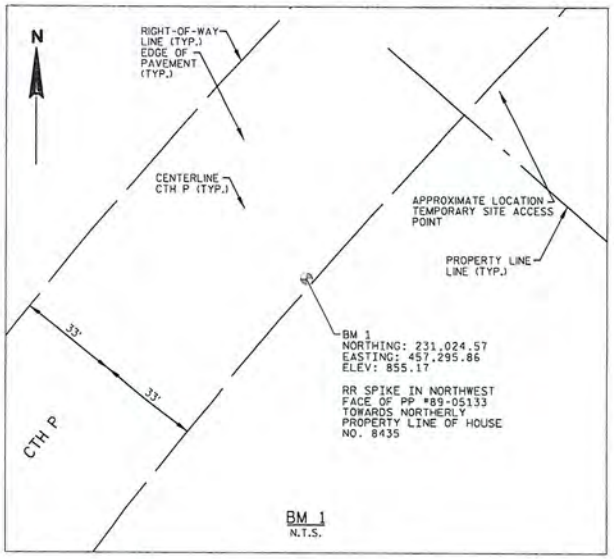
CP 2161
N.T.S.



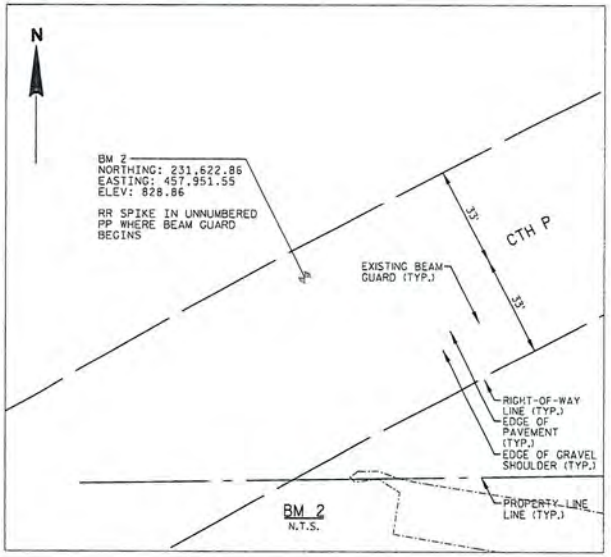
TIES

POINT	TO	POINT	DISTANCE (FT)
CP2162	-	1	38.32
CP2162	-	2	24.99
CP2162	-	3	54.92

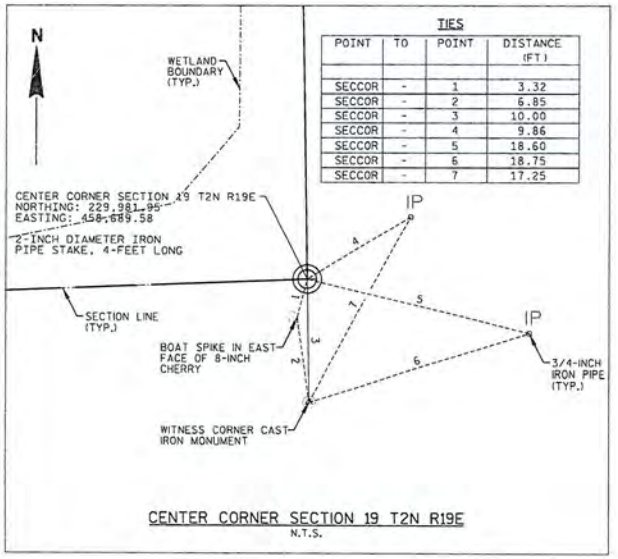
CP 2162
N.T.S.



BM 1
N.T.S.



BM 2
N.T.S.



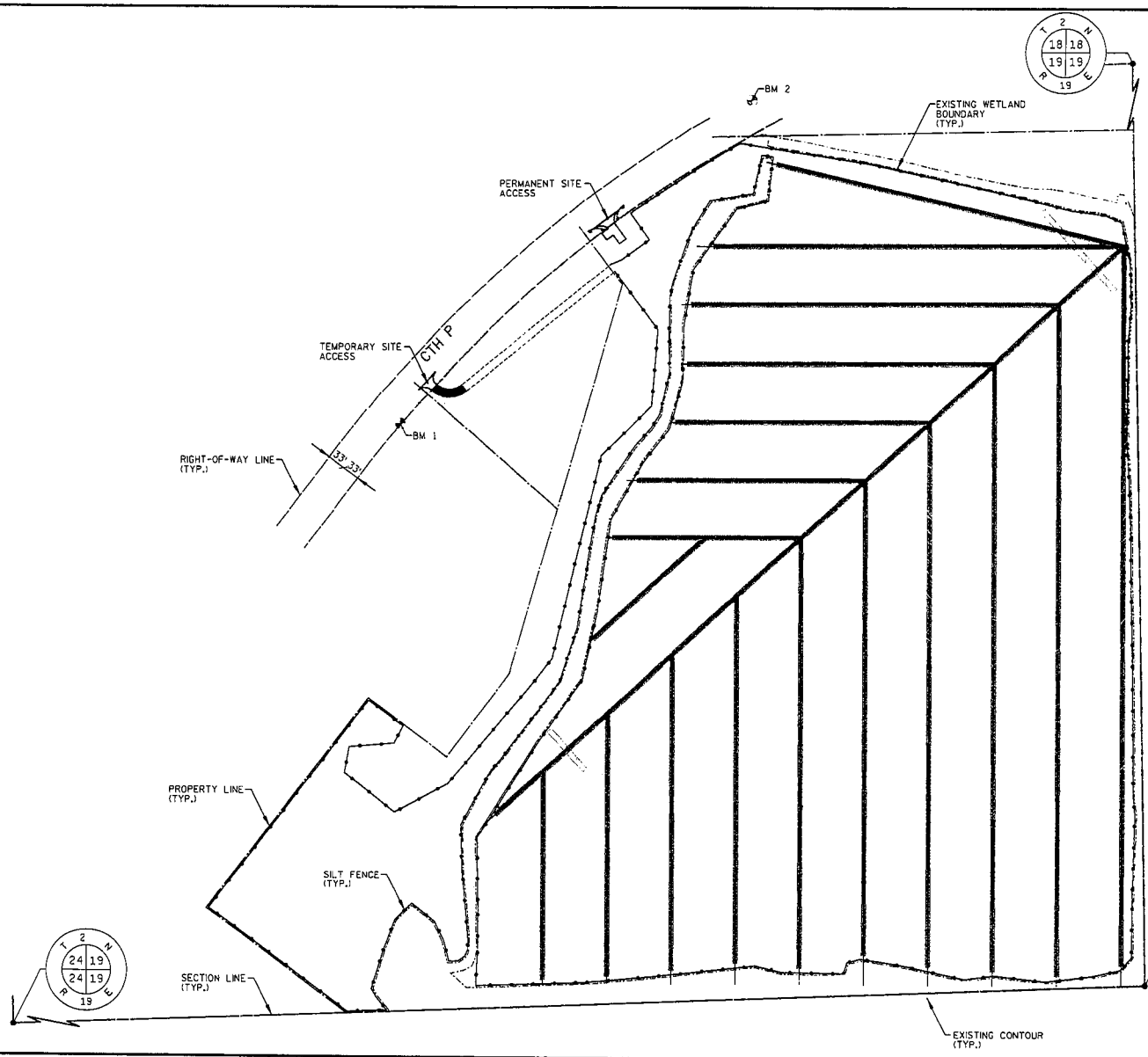
TIES

POINT	TO	POINT	DISTANCE (FT)
SECCOR	-	1	3.32
SECCOR	-	2	6.85
SECCOR	-	3	10.00
SECCOR	-	4	9.86
SECCOR	-	5	18.60
SECCOR	-	6	18.75
SECCOR	-	7	17.25

CENTER CORNER SECTION 19 T2N R19E
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	ALIGNMENT TIES	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\027201_ed.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_



DRAIN TILE DISABLEMENT LEGEND

- DRAIN TILE (APPROXIMATE LOCATION)
- DRAIN TILE DISABLEMENT
- DRAIN TILE EXPLORATION

SUGGESTED DRAIN TILE DISABLEMENT SEQUENCE OF EVENTS

1. USE DRAIN TILE EXPLORATION TO EXPOSE THE DRAIN TILE MAIN LINE.
2. DISABLE DRAIN TILE MAIN LINE MAKING SURE TO LOCATE ALL CONNECTING DRAIN TILE LINES.
3. DISABLE ALL OTHER DRAIN TILE LINES LOCATED DURING DISABLEMENT OF DRAIN TILE MAIN LINE.

NOTES:

1. THE ENTIRE DRAIN TILE SYSTEM IS TO BE DISABLED.
2. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
3. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
4. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
5. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
6. SEE DRAIN TILE DISABLEMENT CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	DRAIN TILE DISABLEMENT	SCALE, FEET 0 100 200	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\027301_dp.dgn
PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

WISDOT/CADDS SHEET 42

REMOVING GUARDRAIL

LOCATION	204.0165 LF
PERMANENT SITE ACCESS POINT	82
TOTAL	82

EXCAVATION COMMON

LOCATION	205.0100 CY
TRACKING MAT	16.85
TOTAL	16.85

BASE AGGREGATE

LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON
TEMPORARY SITE ACCESS POINT	13.69
PERMANENT SITE ACCESS POINT	43.00
TOTAL	56.69

BREAKER RUN

LOCATION	311.0110 TON
TRACKING MAT	58.97
TOTAL	58.97

ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES

LOCATION	465.0120 TON
TEMPORARY SITE ACCESS POINT	6.78
PERMANENT SITE ACCESS POINT	21.28
TOTAL	28.06

DRAIN TILE EXPLORATION

LOCATION	612.0700 (LF)
SOUTHWEST PORTION WETLAND RESTORATION AREA	100
NORTHEAST PORTION WETLAND RESTORATION AREA	200
TOTAL	300

STEEL PLATE BEAM GUARD CLASS A

LOCATION	614.0305 (LF)
PERMANENT SITE ACCESS POINT	53
TOTAL	53

3

3

MULCHING, SEEDING MIXTURE NO. 70, SEED BED PREPARATION, SEEDING, ROOTSTOCK PROTECTION, ROOTSTOCK, SEED MIX

LOCATION	627.0200* MULCHING SY	630.0170* SEEDING MIXTURE NO. 70 LB	630.0400* SEEDING NURSE CROP LB	SPV.0005.01 SEED BED PREPARATION ACRE	SPV.0005.02 SEEDING ACRE	SPV.0005.03 ROOTSTOCK PROTECTION ACRE	SPV.0060.01 ROOTSTOCK EACH	SPV.0085.01 SEED MIX LB
DEEP MARSH ROOTSTOCK PLANTING ZONE	24429			1.54		1.54	2685	
DEEP MARSH SEEDING ZONE				4.21	4.21			50.52
SHALLOW MARSH SEEDING ZONE				5.96	5.96			71.52
WET MEADOW SEEDING ZONE				21.41	21.41			256.92
TALL GRASS PRAIRIE SEEDING ZONE				5.05	5.05			60.60
TEMPORARY SITE ACCESS POINT	685	2.46	4.93					
UNDISTRIBUTED	68	0.25	0.49					
TOTALS	25182	2.71	5.42	38.17	36.63	1.54	2685	439.56

* NOTE: ADDITIONAL QUANTITIES OF THESE ITEMS ARE ALSO REQUIRED FOR ITEM NUMBER SPV.0105.02 GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF1	SF2	168	17
SF2	SF3	76	8
SF3	SF4	150	15
SF4	SF5	150	15
SF5	SF6	86	9
SF6	SF7	66	7
SF7	SF8	33	3
SF8	SF9	78	8
SF9	SF10	81	8
SF10	SF11	71	7
SF11	SF12	181	18
SF12	SF13	75	8
SF13	SF14	83	8
SF14	SF15	116	12
SF15	SF16	79	8
SF16	SF17	165	17
SF17	SF18	89	9
SF18	SF19	44	4
SF19	SF20	36	4
SF20	SF21	157	16
SF21	SF22	111	11
SF22	SF23	31	3
SF23	SF24	54	5
SF24	SF25	87	9
SF25	SF26	98	10
SF26	SF27	55	6
SF27	SF28	109	11
SF28	SF29	56	6
SF29	SF30	33	3
SF30	SF31	26	3
SF31	SF32	21	2
SF32	SF33	116	12
SF33	SF34	51	5
SF34	SF35	199	20
SF35	SF36	56	6

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF36	SF37	61	6
SF37	SF38	40	4
SF38	SF39	167	17
SF39	SF40	71	7
SF40	SF41	69	7
SF41	SF42	139	14
SF42	SF43	211	21
SF43	SF44	145	15
SF44	SF45	127	13
SF45	SF46	175	18
SF46	SF47	123	12
SF47	SF48	79	8
SF48	SF49	42	4
SF49	SF50	51	5
SF50	SF51	99	10
SF51	SF52	106	11
SF52	SF53	138	14
SF53	SF54	61	6
SF54	SF55	83	8
SF55	SF56	21	2
SF56	SF57	74	7
SF57	SF58	82	8
SF58	SF59	65	7
SF59	SF60	99	10
SF60	SF61	29	3
SF61	SF62	63	6
SF62	SF63	77	8
SF63	SF64	80	8
SF64	SF65	29	3
SF65	SF66	44	4
SF66	SF67	78	8
SF67	SF68	36	4
SF68	SF69	42	4
SF69	SF70	210	21
SF70	SF71	102	10
SF71	SF72	69	7
SF72	SF73	112	11

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF73	SF74	30	3
SF74	SF75	116	12
SF75	SF76	85	9
SF76	SF77	123	12
SF77	SF78	29	3
SF78	SF79	12	1
SF79	SF80	16	2
SF80	SF81	17	2
SF81	SF82	39	4
SF82	SF83	39	4
SF83	SF84	55	6
SF84	SF85	45	5
SF85	SF86	62	6
SF86	SF87	72	7
SF87	SF88	18	2
SF88	SF89	30	3
SF89	SF90	74	7
SF90	SF91	321	32
SF91	SF92	164	16
SF92	SF93	328	33
SF93	SF94	80	8
SF94	SF95	37	4
SF95	SF96	84	8
SF96	SF97	49	5
SF97	SF98	119	12
SF98	SF99	112	11
SF99	SF100	303	30
SF100	SF101	390	39
SF101	SF102	132	13
SF102	SF103	141	14
SF103	SF104	135	14
SF105	SF106	24	2
SF106	SF107	64	6
SF107	SF108	60	6
SF108	SF109	56	6
SF109	SF1	186	19
UNDISTRIBUTED (25%)		2508	251
	TOTALS	12541	1261

EROSION CONTROL MOBILIZATIONS

LOCATION	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
PROJECT 3180-08-71	2	2
TOTALS	2	2

TRAFFIC CONTROL

LOCATION	ITEM 643.0420 TRAFFIC CONTROL BARRICADES TYPE III DAYS	ITEM 643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A DAYS	ITEM 643.0900 TRAFFIC CONTROL SIGNS DAYS
CTH P	288	288	576
TOTALS	288	288	576

* NOTE: SEE SDD 15D29-1 TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD FOR PLACEMENT

GEOTEXTILE FABRIC TYPE SAS

LOCATION	645.0140 SY
TRACKING MAT	116.46
TOTAL	116.46

DRAIN TILE DISABLEMENT

LOCATION	SPV.0090.01 LF
WETLAND RESTORATION AREA	13600
TOTAL	13600

CONSTRUCTION STAKING SEEDING AND PLANTING ZONES

LOCATION	SPV.0105.01 LS
WETLAND RESTORATION AREA	1
TOTAL	1

GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

LOCATION	SPV.0105.02 LS
PERMANENT SITE ACCESS POINT	1
TOTAL	1

APPROXIMATE BID ITEM QUANTITIES REQUIRED FOR SPV.0105.02		
ITEM NO.	ITEM DESCRIPTION	QUANTITY
208.0100*	BORROW	570 CY
625.0500*	SALVAGED TOPSOIL	490 SY
627.0200*	MULCHING	490 SY
630.0170*	SEEDING MIXTURE NO. 70	1.73 LB
630.0400*	SEEDING NURSE CROP	3.47 LB

* NOTE: THESE QUANTITIES ARE NOT INCLUDED ELSEWHERE IN THE PLANS OR ESTIMATE

R/W PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
3180-08-21		
FEDERAL PROJECT NUMBER	4.0	

PLAT OF RIGHT OF WAY REQUIRED FOR

STH 11 - BURLINGTON BYPASS

WETLAND MITIGATION SITE

STH 11 — RACINE CO.

CONSTRUCTION NO. 3180-08-71

CONVENTIONAL SIGNS AND ABBREVIATIONS

ACCESS POINT	A.P.	STATE LINE	
ACCESS RIGHTS	A.R..	COUNTY LINE	
ACRES	AC.	TOWN AND RANGE LINE	
AHEAD	AH.	SECTION LINE	
AND OTHERS	ET. AL.	QUARTER LINE	
BACK	BK.	SIXTEENTH LINE	
BARN	B	NEW CENTERLINE	
CENTERLINE	℄	OLD CENTERLINE	
CENTRAL ANGLE OR DELTA	Δ	PROPOSED OR NEW R/W LINE	
CONSTRUCTION PERMIT	C.P.	EXISTING R/W LINE	
CONVEYANCE	CONV.	PROPERTY LINE	
CORNER	COR.	LOT, TIE AND OTHER MINOR DASHED LINES	
DEED	(D)	SLOPE INTERCEPTS	
DIST. BETWEEN ¼ CORNERS	(DIST.)	CORPORATE LIMITS	
DOCUMENT	DOC.	WATER	
ESTATE	EST.	GAS	
EXCLUDING	EXCL.	TELEPHONE OR TELEGRAPH	
FRONTAGE ROAD	FR. RD.	ELECTRIC	
GARAGE	G	CABLE TELEVISION	
HOUSE	H	FIBER OPTIC	
LAND CONTRACT	L.C.	SANITARY SEWER	
LENGTH OF CURVE	L	STORM SEWER	
LONG CHORD	L. CH.	NO ACCESS (By Previous Acquisition)	
MONUMENT	MON.	NO ACCESS (By Acquisition)	
OUTLOT	O.L.	NO ACCESS (By Statutory Authority)	
PERMANENT	PERM.	LIMITED EASEMENT (Temporary or Permanent)	
PROPERTY LINE	P.L.	WELL	WELL
QUIT CLAIM DEED	Q.C.D.	SEPTIC PUMP	S.P.
RADIUS	R	SEPTIC TANK	S.T.
REFERENCE LINE	℟	SEPTIC VENT	S.V.
RELOCATED	RELOC.	SIGN	SIGN
REMAINING	REM.		
RIGHT OF WAY	R/W		
SECTION	SEC.		
SEVERED	SEV.		
STATION	STA.		
TANGENT	TAN.		
TEMPORARY	TEMP.		
TEMPORARY INTEREST	TI		
TRANSIT LINE	T		
BRIDGE			
BUILDING			
CATTLE PASS			
IRON PIPE	I.P.		
POWER POLE			
TELEPHONE POLE			
TELEPHONE PEDESTAL	T.P.		
R/W MONUMENT			
R/W STANDARD			
GAS PUMP ISLAND	G.P.		

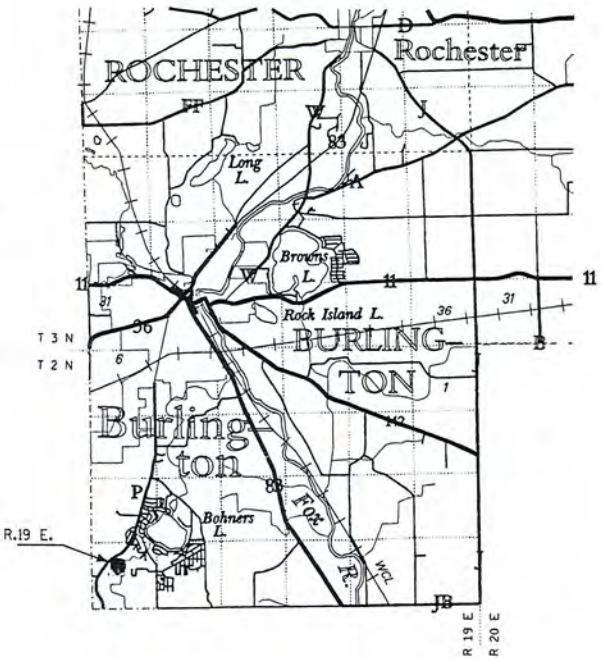
NOTES

ALL COORDINATES ARE GROUND BASED.

BEARINGS ON THIS PLAT ARE ORIENTED TO THE WISCONSIN COORDINATE SYSTEM SOUTH ZONE. ALL PLAT DISTANCES ARE GROUND LENGTH AND MAY BE CONVERTED TO GRID LENGTH BY MULTIPLYING THE THE DISTANCE BY THE GRID FACTOR PROVIDED ON THE DETAIL SHEETS.

RIGHT OF WAY MONUMENTS ARE AND ARE PLACED PRIOR TO OR AT THE TIME OF LAND TITLE TRANSFER.

RIGHT OF WAY BOUNDARIES ARE DEFINED WITH COURSES OF THE PERIMETER OF THE HIGHWAY LANDS REFERENCED TO THE U.S. PUBLIC LAND SURVEY OR OTHER SURVEYS OF PUBLIC RECORD.

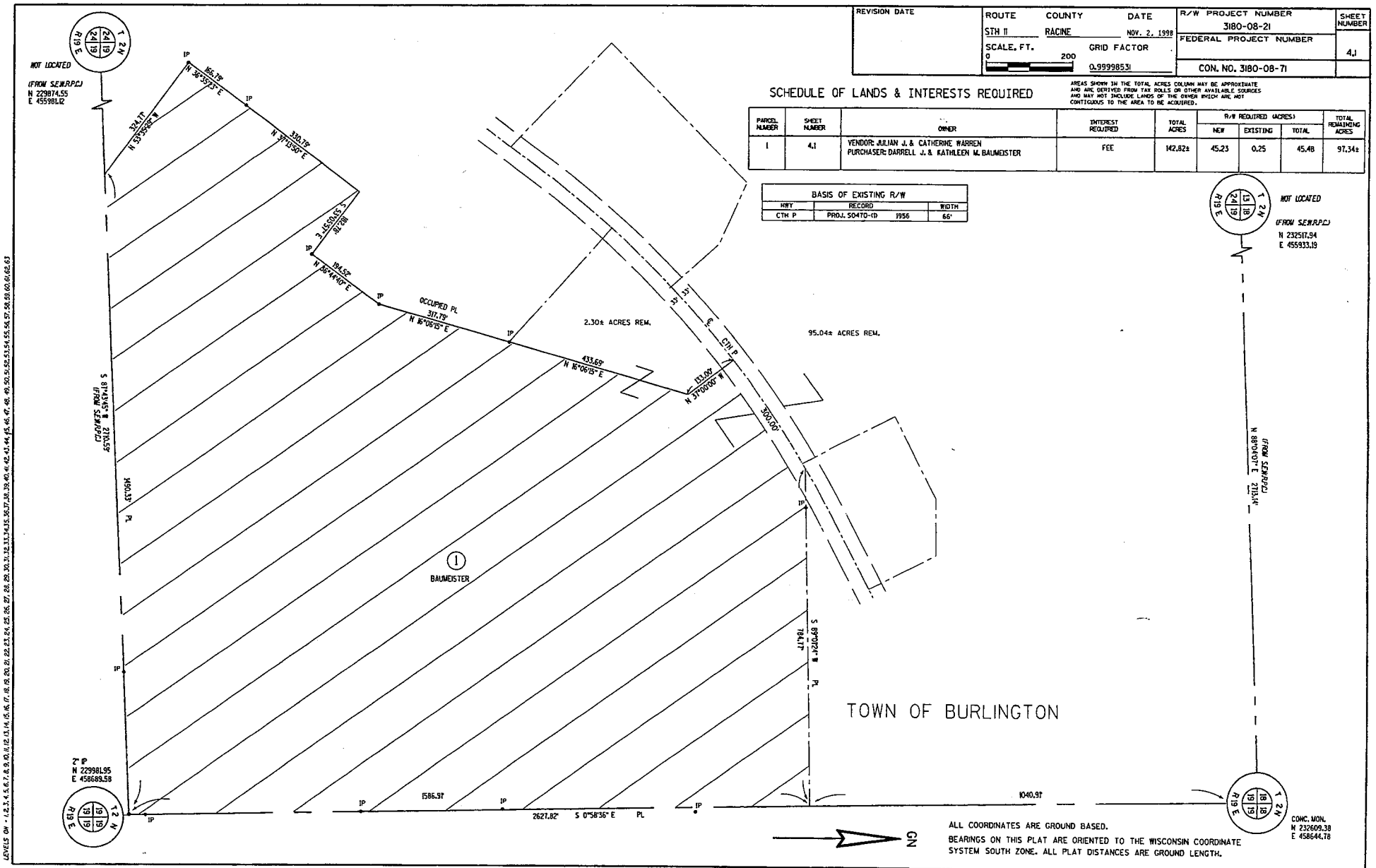


SITE LOCATION IN THE NW 1/4 OF SEC. 19, T. 2 N., R.19 E.

LAYOUT SCALE 0 1 MI.

REVISION DATE	STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
	APPROVED FOR DISTRICT OFFICE:
	DATE: 11/2/98 Michael L. Pitts

FILE NAME: RAC_10N ORIGINATOR: LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63 PLOT SCALE : ..... PLOT DATE: ..... REV. DATE:



REVISION DATE	ROUTE	COUNTY	DATE	R/W PROJECT NUMBER	SHEET NUMBER
	STH 11	RACINE	NOV. 2, 1998	3180-08-21	
	SCALE. FT. 0 200	GRID FACTOR 0.99998531		FEDERAL PROJECT NUMBER	4.1
				CON. NO. 3180-08-71	

SCHEDULE OF LANDS & INTERESTS REQUIRED

AREAS SHOWN IN THE TOTAL ACRES COLUMN MAY BE APPROXIMATE AND ARE DERIVED FROM TAX ROLLS OR OTHER AVAILABLE SOURCES AND MAY NOT INCLUDE LANDS OF THE OWNER WHICH ARE NOT CONTIGUOUS TO THE AREA TO BE ACQUIRED.

PARCEL NUMBER	SHEET NUMBER	OWNER	INTEREST REQUIRED	TOTAL ACRES	R/W REQUIRED (ACRES) NEW	EXISTING	TOTAL	TOTAL REMAINING ACRES
1	4.1	VENDOR: JULIAN J. & CATHERINE WARREN PURCHASER: DARRELL J. & KATHLEEN M. BAUMEISTER	FEE	142.82±	45.23	0.25	45.48	97.34±

BASIS OF EXISTING R/W

HWY	RECORD		WIDTH
CTH P	PROJ. 50470-01	1956	66'

LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63
PLOT SCALE:
PLOT NAME:
REV. DATE:
ORIGINATOR: DISTRICT 2
FILE NAME: MDGN: CADD.DGN

EXHIBIT 3:
Special Provisions
for the
Baumeister Wetland Mitigation Site Construction

Special Provisions

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9.	Seeding, Item SPV.0005.02.	5
10.	Rootstock Protection, Item SPV.0005.03.	6
11.	Rootstock, Item SPV.0060.01	7
12.	Seed Mix, Item SPV.0085.01.	9
13.	Drain Tile Disablement, Item SPV.0090.01	13
14.	Construction Staking Seeding and Planting Zones, Item SPV.0105.01	13
15.	Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02	14

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 3180-08-71, City of Burlington Bypass (Wetland Mitigation – Baumeister Farm), located in the Town of Burlington, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2003 Edition, the Supplemental Specifications 2005 Edition, and these special provisions including the Additional Special Provisions (ASP's). The department considers only standard specifications, supplemental specifications and interim supplemental specifications issued directly from the department as valid for this contract.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.
(100105)

2. Scope of Work.

The work under this contract consists of construction of a site access point and wetland restoration at a 45.5-acre site and includes drain tile disablement, seedbed preparation, seeding, rootstock planting, rootstock protection and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract. (082003)

3. Prosecution and Progress

Begin work within 10 calendar days after the engineer issues a written notice to proceed.

Provide the start date to the engineer in writing within one month after executing the contract, but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within 10 calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

Proceed according to the following schedule of operations:

1. Install temporary site access point

2. Install erosion control
3. Install temporary stream crossings, if necessary
4. Disable drain tile (Suggested sequence: Complete drain tile exploration at each end of the main then disable the main. Locate and flag tile laterals as the main is disabled, then disable all lateral tiles).
5. Complete all work within the seeding and planting areas (October 7 to November 15, 2006)
6. Remove temporary crossings (if installed)
7. Install permanent access point
8. Restore disturbed areas

All topsoil stripped to construct the temporary site access point and tracking pad is to be placed in a neat pile on site with the project manager's approval. The pile should be near the entrance for the temporary site access point and will be removed by others.

4. Utilities

This contract is not subject to the provisions of Administrative Rule TRANS 220.

There are known utility facilities located adjacent to the project limits. Coordinate construction activities with a call to Diggers Hotline per statutes. Use caution to ensure the integrity of underground facilities and overhead lines. Bidders are advised to contact each utility listed in the plans prior to preparing their bids. The following is a list of the utilities with facilities in the area:

We Energies – Electric
We Energies has electric facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

We Energies – Gas Operations
We Energies has gas facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

SBC
SBC has a telephone line located in the right-of-way southeast of CTH P. The proposed work for the site access points is above this line. Although this facility is below the proposed work, it will not have any conflicts with the proposed work.

Time Warner Cable
Time Warner Cable has facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

5. Environmental Protection.

Section 107.18 of the Standard Specifications is supplemented as follows:

All equipment to be used on the site must be relatively free of material that may contain

weed seed, such as purple loosestrife or other non-native and/or invasive species, upon entering or exiting the site. Make equipment available for inspection by the engineer prior to operating within the mitigation site limits.

Provide the Erosion Control Implementation Plan (ECIP) 14 days prior to the Pre-Construction Conference.

Blanding's turtles are known to occur adjacent to the project area. If any Blanding's turtles are observed within the construction area, they should be immediately relocated out of the construction area and to a suitable location as approved by the engineer in the field.

Do no store or operate equipment, stockpile materials, or place settling basins in wetlands as shown on the plan, unless approved by the engineer.

Broom or brush any mud, dirt or debris deposited on CTH P or other roads, as a result of entering and leaving the construction site, as directed and approved by the engineer.

6. Steel Plate Beam Guard Class A.

Radii tighter than 75 feet shall be shop bent by the manufacturer prior to delivering the beam guard to the project site.
(082003) 614-020

7. Mulching

Perform this work in accordance with the Section 627 of the Standard Specifications, except as hereinafter modified.

Provide mulching material for all seeding areas, consisting of clean straw free of debris, with no weed seed, including reed canary grass, purple loosestrife, Canada thistle, giant reed grass, leafy spurge, spotted knapweed, box elder, buckthorn, or other non-native and/or invasive species.

Place mulch the same day of seeding. Where required, uniformly spread mulch over the seeded zones as indicated on the plan to a loose depth of ½ to 1½ inch by blowing from a machine, by hand, or as directed by the engineer.

8. Seed Bed Preparation, Item SPV.0005.01

A Description

This special provision describes preparing the seed bed for planting rootstock and seeding in the deep marsh zone, and seeding in the shallow marsh, wet meadow and tall grass prairie zones as shown on the plan and as hereinafter provided.

B Materials (Vacant)

C Construction Methods
Provide the engineer with 5 working days notice prior to any discing. Mow existing vegetation to within 6 inches of the ground surface. Work the upper 6 inches of topsoil at locations specified in the plan until the size of existing vegetation, stalks, leaves and other biomass does not exceed an average of 6 inches in size, or as directed by the engineer. Disc no more than 7 days prior to the time of seeding or as directed by the engineer. If planting does not occur within 7 days following discing, repeat specified discing (at the cost of the contractor) to ensure a proper seeding surface. Once discing has been performed, prohibit driving over the disced area with equipment or vehicles prior to seeding activities.

D Method of Measurement
The department will measure Seed Bed Preparation by the acre acceptably prepared.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.01	Seed Bed Preparation	Acre

Payment is full compensation for discing and firming the seed bed and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

9. Seeding, Item SPV.0005.02.

A Description
This special provision describes storing, mixing, sowing and raking the seed mix provided under Seed Mix, in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones as shown on the plans or as directed by the engineer. Perform seeding in accordance with the requirements hereinafter provided.

B Materials
Utilize native seed provided in accordance with Seed Mix, Item SPV.0085.01.

C Construction Methods
Mix the seed at the project site according to the seeding schedules specified under the item of Seed Mix, or as directed by the engineer. Sow seed after October 15, 2006 and prior to November 15, 2006. Do not seed in flooded areas or when conditions are otherwise unsatisfactory for seeding. Provide the engineer 5 working days' notice prior to any seeding activities.

Mix and sow seed on the same day. Sow cover crop and native seed together. Seed using Method A, Section 630.3.3.1 in the Standard Specifications and the following additional techniques.

C.1 Shallow Marsh Seeding Zone (5.96 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Deep Marsh Seeding Zone (4.21 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.3 Wet Meadow Seeding Zone (21.41 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Tall Grass Prairie Seeding Zone (5.05 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

D Measurement
The department will measure Seeding by the acre acceptably completed.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.02	Seeding	Acre

Payment is full compensation for handling, on-site storage of seed, weighing, mixing, sowing and raking; supplying water, sand, and/or sawdust for mixing seed; and for all labor, tools, equipment and incidentals necessary to complete the work.

10. Rootstock Protection, Item SPV.0005.03.

A Description

This special provision describes furnishing, installing, and maintaining Rootstock Protection according to the plan, and as directed by the project engineer. Install Rootstock Protection prior to the rootstock planting. Maintain Rootstock Protection throughout the life of the contract, as needed, or within 24 hours of notification by the engineer.

B Materials

Use posts consisting of 1-inch by 2-inch by 5-foot wooden stakes and cross members consisting of biodegradable, natural organic fiber bailing twine.

C Construction

Install posts a minimum of 2 feet into the ground or to a depth that secures the post and resists being pushed over. Install Rootstock Protection in such a manner as to provide grid-like patterns 10 feet by 20 feet through the area of the rootstock plantings. Extend the perimeter of the Rootstock Protection 2 feet in all directions beyond the limits of the rootstock plantings. Attach bailing twine for cross members to all posts as shown in the plan using knots or any other means approved by the engineer. Attach bailing twine to all intermediate posts by means approved by the engineer.

D Measurement

The department will measure Rootstock Protection per unit acre acceptable completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.03	Rootstock Protection	Acre

Payment is full compensation for furnishing all materials, installing posts, cross members, disposal of surplus materials; maintaining the Rootstock Protection through the life of the contract; and for all labor, tools, equipment, and incidentals necessary to install the Rootstock Protection.

11. Rootstock, Item SPV.0060.01

A Description

This special provision describes furnishing and planting wetland herbaceous plant rootstock of the species specified, complete in place in the deep marsh rootstock planting area as designated on the plans, or as directed by the engineer. It includes furnishing all necessary materials and performing all necessary work such as excavating plant holes, anchoring rootstock, and necessary care, such as trimming, required replacements pending acceptance, and such work necessary and incidental thereto to complete the item in accordance with the plans, specifications and contract.

B Materials

The source of all plant materials is nursery-grown stock, not wild-collected, from an area not to exceed 150 linear miles from the project site, and within the State of Wisconsin. All plants must be healthy, 1 to 2 years old, and have well-developed root systems. Plants that show evidence of mold, rot, freezing, or frost damage will be rejected. Where evidence is submitted that a specified rootstock cannot be obtained, substitutions may be made upon the specific approval of the engineer.

Deep Marsh (1.54 Acres)

Scientific Name	Common Name	Quantity
Scirpus atrovirens	blue green bulrush	500
Scirpus fluviatilis	river bulrush	500
Scirpus validus	softstem bulrush	500
Acorus calamus	duck potato	500
Sparganium eurycarpum	giant bur-reed	300
Pontedaria cordata	pickerelweed	200
Sagittaria latifolia	broad-leaved arrowhead	185
	Total:	2,685

C Construction Methods

Plant rootstock in the deep marsh planting zone prior to seeding and mulching operations and within the specified planting periods. Provide the engineer with 5 working days notice of the intended date of delivery of Rootstock to the project site. Present all rootstock to the engineer for inspection and partial acceptance prior to planting.

C.1 Timing

Plant wetland rootstock on the day of delivery at the project site. In the event that this is not possible, temporarily store plants by placing them in a well-ventilated, cool, shaded, moist storage space (not to exceed 48 hours).

C.2 Planting layout

Plant Rootstock at a density of approximately 1750 per acre within the deep marsh planting zone as shown in the plan or as directed by the engineer.

C.3 Planting Method

Plant Rootstock by hand with the use of a tree spud or other comparable method; or as directed by the engineer.

C.4 Care

Handle Rootstock with care and skill to prevent damage; keep moist and cool prior to planting. Do not disturb freshly planted Rootstock with subsequent activities that would cause uprooting or injury.

D Measurement

The department will measure Rootstock as each individual rootstock acceptably planted according to the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Rootstock	Each

Payment is full compensation for furnishing, delivering, storing and planting the plants and for furnishing all labor, tools, and equipment and incidentals necessary to complete the work.

12. Seed Mix, Item SPV.0085.01.

A Description
This special provision describes supplying native seed for planting in the deep and shallow marsh, wet meadow and tall grass seeding zones as indicated on the plan; supplying seed samples, germination test data and storage and delivery of seed; all in accordance with the special provisions provided herein.

B Material
Use the following native seed specifications during seed acquisition.

1. Provide native seed true to species, packed separately, with label information including scientific and common name, quantity, date and location picked, name and company supervising the picking.

2. Provide seed free of non-seed debris and of non-native and/or invasive species including, but not limited to, reed canary grass, purple loosestrife, spotted knapweed and Canada thistle.

3. Provide seed of local ecotype and origin no further than 150 linear miles from the project location, and from within the State of Wisconsin.

4. Provide seed that was picked at the appropriate time for ripeness and viability. Obtain germination test results and certification for a random sample of each species prior to receiving delivery of the seed. Provide written documentation of germination tests to the engineer prior to seeding.

5. Accept seed only if it has a minimum germination rate of 80 percent. If the seed does not meet the minimum required 80 percent germination rate, additional seed must be supplied at the cost of the seed supplier/contractor to meet the total viable seed quantity.

6. Deliver a representative sample of each species to the engineer for inspection and

identification prior to the acceptance of the seed.

7. Provide cover crop in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones consisting of perennial rye (*Lolium perenne*).

8. Use the following seeding schedule in each of the designated zones. Substitutions or changes to the seeding schedule must be approved by the engineer prior to seeding. All seed quantities provided assume a minimum 80% germination rate.

B.1 Seed Mixes
Seeding rates and mixes are as follows, or as directed by the engineer:

B.1.1 Shallow Marsh Seeding Zone (5.96 Acres)
The seed mix for the shallow marsh planting zone is composed of 71.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 119.2 pounds of cover crop in the shallow marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 71.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total shallow marsh seed mix.

Scientific Name	Common Name
Glyceria striata	manna grass
Alisma triviale	water plantain
Scirpus acutus	hard stem bulrush
Scirpus cyperinus	wool grass
Scirpus validus	softstem bulrush

B.1.2 Deep Marsh Seeding Zone (4.21 Acres)
The seed mix for the deep marsh planting zone is composed of 50.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 84.2 pounds of cover crop in the deep marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 50.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total deep marsh seed mix.

Scientific Name	Common Name
Scirpus atrovirens	blue green bulrush
Scirpus fluviatilis	river bulrush
Acorus calamus	duck potato
Sparganium eurycarpum	giant bur-reed
Pontedaria cordata	pickerelweed
Sagittaria latifolia	broad-leaved arrowhead
Zizania aquatica	wild rice

B.1.3 Wet Meadow Seeding Zone (21.41 Acres)

The seed mix for the wet meadow planting is composed of 85.64 pounds of sedges and rushes, 85.64 pounds of grasses and 85.64 pounds of forbs, for a total of 256.92 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 428.2 pounds of cover crop in the wet meadow seeding zone.

a. Sedges and Rushes. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total sedge and rush seed mix.

Scientific Name	Common Name
Carex comosa	bottlebrush sedge
Carex cristatella	crested oval sedge
Carex granularis	meadow sedge
Carex hystericina	porcupine sedge
Carex scoparia	lance-fruited oval sedge
Carex stipata	awl-fruited sedge
Carex vulpinoidea	fox sedge
Scirpus atrovirens	green bulrush
Scirpus validus	soft-stemmed bulrush

b. Grasses. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 3 species, with no individual species comprising more than 35% of the total grass seed mix.

Scientific Name	Common Name
Elymus canadensis	Canada wild rye
Glyceria striata	fowl manna grass
Calamagrostis canadensis	Canada blue joint
Leersia oryzoides	rice cut grass

c. Forbs. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 10 species, with no individual species comprising more than 15% of the total forb seed mix.

Scientific Name	Common Name
Solidago gigantea	giant goldenrod
Aster puniceus	bristly aster
Aster novae-angliae	New England aster
Helenium autumnale	sneezeweed
Verbena hastata	blue vervain
Mimulus ringens	monkey flower
Thalictrum dasycarpum	tall meadow rue
Vernonia fasciculata	ironweed
Angelica atropurpurea	angelica
Asclepias incarnata	marsh milkweed
Eupatorium maculatum	joe pye weed
Eupatorium perfoliatum	boneset

B.1.4 Tall Grass Prairie Seeding Zone (5.05 Acres)

The seed mix for the tall grass prairie seeding zone is composed of 40.40 pounds of grasses and 20.20 pounds of forbs, for a total of 60.60 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 101.00 pounds of cover crop in the tall grass prairie seeding zone.

Grasses. Seed at 8 pounds per acre for a total of 40.40 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total grass seed mix.

Scientific Name	Common Name
Andropogon gerardii	big bluestem
Bouteloua curtipendula	side oats grama
Elymus canadensis	Canada wild rye
Panicum virgatum	switch grass
Sorghastrum nutans	Indian grass
Sporobolus heterolepsis	prairie dropseed
Schizachyrium scoparium	little bluestem

Forbs. Seed at 4 pounds per acre for a total of 20.20 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total forb seed mix.

Scientific Name	Common Name
Desmodium canadense	tick clover
Echinacea purpurea	purple coneflower
Heliopsis helianthoides	oxeye sunflower
Monarda fistulosa	bergamot
Ratibida pinnata	yellow coneflower
Rudbeckia hirta	black-eyed susan
Solidago rigida	stiff goldenrod

C (Vacant)

D Measurement

The department will measure Seed Mix meeting the required 80 percent germination rate by actual pounds of native seed supplied.

Native seed not meeting the required 80 percent germination rate will be measured by the equivalent pounds, based on the following formula for each species.

Equivalent pounds =
(number of actual pounds of native seed supplied) X (actual percent germination rate/80)

E Basis of Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER DESCRIPTION UNIT

SPV.0085.01	Seed Mix	LB

Payment is full compensation for furnishing and delivery of native seed and cover crop to the project site, providing seed samples and germination data and the necessary labor, tools, equipment, and incidentals necessary to complete the work.

13. Drain Tile Disablement, Item SPV.0090.01

A Description

This special provision describes disabling the existing drain tile system by removing the cover soil and crushing the tile in place followed by filling the resulting trench as hereinafter provided.

B Materials (Vacant)

C Construction Methods

Disable drain tile prior to any seeding or planting in the specified seeding zones. Drain Tile Exploration, Item 612.0700 will be accomplished to verify the approximate location of the drain tile main as shown on the plans. Disable drain tile by excavating a trench as shown in the plans at the approximate location shown on the plan and as identified per Drain Tile Exploration, Item 612.0700. Utilize a back hoe or similar equipment to complete excavation. After drain tile has been exposed, crush the tile with a back hoe bucket or equivalent. Drain tile will be considered sufficiently crushed when no tile fragments greater than 6 inches in diameter remain. Once the engineer has verified that the tile has been sufficiently crushed, fill the resulting trench with the spoil removed during the tile excavation.

D Method of Measurement

The department will measure Drain Tile Disablement by the linear foot acceptably disabled.

E Basis of Payment

The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.01	Drain Tile Disablement	LF

Payment is full compensation for disabling drain tile, filling the resulting trench and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

14. Construction Staking Seeding and Planting Zones, Item SPV.0105.01

A Description

This special provision describes locating and staking the boundaries of the silt fence and seeding and planting zones as shown on the plans.

B Materials
Use wooden lath a minimum of 4 feet in length labeled with the appropriate information (station, location of seeding or planting zones).

C Construction Method
Once boundaries are located, install lath a minimum of 1 foot into the ground or to a depth that secures the lath and resists being pushed over. Stake boundaries of the seeding and planting zones at a minimum of 50-foot intervals or such intervals required to properly delineate boundaries.

D Method of Measurement
The department will measure Construction Staking Seeding and Planting Zones as a single lump sum unit for each construction staking acceptably completed.

E Basis of Payment
The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.01	Construction Staking Seeding and Planting Zones	LS

Payment is full compensation for furnishing all materials, locating boundaries, installing and labeling lath, and for all labor, tools, equipment, and incidentals necessary to complete the work required under this bid item.

15. Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02

A Description
This special provision describes excavating, filling, grading, shaping and compacting and finishing as necessary to construct the permanent site access point as shown on the plans, and in accordance with the pertinent requirements of the standard specifications and as hereinafter provided.

B (Vacant)

C Construction
Dispose of all surplus and unsuitable material in accordance with 205.3.12 of the standard specifications.

D Measurement
The department will measure Grading, Shaping and Finishing Permanent Site Access Point as a single complete unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.02	Grading, Shaping & Finishing Permanent Site Access Point	LS

Payment is full compensation for all excavation, grading, shaping, and compacting; providing and placing fill, salvaged topsoil, seed, and mulch; and for furnishing all labor, tools, equipment and incidentals necessary to complete the contract work.

The base course, surfacing and finishing items will be measured and paid for under the pertinent items provided in the contract.

BAUMEISTER WETLAND MITIGATION SITE

THIRD YEAR MONITORING REPORT

DECEMBER 2009

Wisconsin Department of Transportation
Southeast District
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1.0 INTRODUCTION

Construction of the Burlington Bypass (STH 11) required grading, filling and excavation for the new roadway and for vertical and horizontal realignment at intersecting roadways. The first phase of construction (*STH 11 Bypass Eastern Segment*) began in the spring of 2006 and resulted in unavoidable wetland loss totaling 37.10 acres. Prior to construction of this bypass segment, in 1997, the Wisconsin Department of Transportation (WisDOT) conducted a wetland mitigation site search. The Baumeister parcel (Site) was identified as a potential site for compensatory mitigation for wetland impacts associated with the STH 11 Bypass Eastern Segment. The 45.48-acre Site was subsequently purchased by the WisDOT, which restored wetland plant communities that likely occurred historically in this area and enhanced existing natural communities on other portions of the Site.

According to the U.S. Army Corps of Engineers correspondence (2006-2807-DJP) for this project, dated June 8, 2006, the project was designed to preserve 3.4 acres of existing wetlands and 3.91 acres of upland forest; restore 5.05 acres of upland to tall grass prairie, and restore approximately 33.12 acres of prior-converted wetlands. The project included drain tile disablement, and planting and seeding of the upland and wetland restoration areas. The expected wetland plant communities included in the construction plans were 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres of wet meadow, and 5.05 acres of tall grass prairie. During the construction phase of the project, the tall grass prairie restoration area was reduced to 3.65 acres. The remaining 1.4 acres intended for tall grass prairie restoration was preserved in its existing state.

Annual monitoring of the site is required for five years. During this period, public access to the site is prohibited. This third-year monitoring evaluates the third post-construction growing season hydrology and plant communities.

1.1 Site Description

Physical Description of Site

The 45.48-acre Site is located east of CTH P and north of Dyer Lake in the northwest 1/4 of Section 19, Township 2 North, Range 19 East (Figure 1). Dyer Lake is located approximately ½ mile south of the Site in Kenosha County and is connected to the Site by an unnamed tributary that flows in a northeast direction. The Site is bounded primarily by drainage ditches and an unnamed tributary that converge at its northeast corner where the drainage flows in a northeast direction and empties into Bohner Lake. The output from Bohner Lake is Spring Brook, which flows into the Fox River just south of the City of Burlington (Figure 1). Its watershed is an approximate 2.2 square mile area in which the primary land use is rural, including both agricultural and residential development. There are also a number of wetlands and small lakes in the watershed. The local watershed contributing to the Site consists of 69 acres of land.

The ditches were apparently constructed to convey water outputting from an extensive drain tile system that had been installed throughout the entire prior-converted wetland area. The banks and an approximate 25-foot wide strip of vegetation along the tributary and drainage ditches consisted of wet meadow, lowland forest and shrub carr wetland that were dominated by common buckthorn (*Rhamnus cathartica*), honeysuckle species (*Lonicera* spp.), reed canary

grass (*Phalaris arundinacea*), and willow species (*Salix* spp.). Prior to construction, existing wetlands on the Site associated with the ditches and tributary totaled 3.40 acres. Uplands were present in the southern and western portions of the Site (5.05 acres), as well as a prior converted wetland that was typically planted in corn (33.12 acres).

During the construction phase, the drain tile system was disabled and the prior converted wetland restored to shallow marsh, deep marsh, and wet meadow. Upland areas were restored to tall grass prairie. The remainder of the Site consists of 3.91 acres of land that is upland forest, a constructed access point, and other areas not disturbed by the project. Existing wetlands and forested areas were preserved and the entire Site will be managed throughout the 5-year monitoring period to control and eradicate non-native and invasive species.

Land Use

The majority of the Site was utilized for row crop agriculture. According to the previous landowner, the parcel was usually planted in corn. Land use adjacent to the Site consists of several residences, one commercial property, agricultural fields, existing wetlands, and woodlands.

Soils

The Soil Survey of Kenosha and Racine Counties, Wisconsin (Soil Survey) (USDA SCS 1970) identifies the following soil mapping units within the mitigation site: Houghton muck (Ht), Radford silt loam, 0 to 3 percent slopes (RaA), Casco-Rodman Complex, 20 to 35 percent slopes (CrE), Casco loam, 12 to 20 percent slopes, eroded (CeD2), and Fox loam, 6 to 12 percent slopes, eroded (FoC2) (Figure 2).

Houghton muck soils comprise the majority of the Site and consist of very poorly drained, deep, organic soils that have formed from the decomposition of grasses and sedges. Houghton muck soils generally form in broad depressions and basins and have poor internal drainage.

Radford soils are somewhat poorly drained and occupy small depressions, drainageways, and other wet areas that abut well-drained, eroded slopes. Radford soils typically have slow surface runoff, moderate permeability, and slow internal drainage. The Radford soils found on the Site are found on slopes ranging from 0 to 3 percent.

The Casco-Rodman complex and Casco soils on the Site consist of well-drained to excessively drained, loamy soils that have formed over calcareous sand and gravel outwash. They generally are found along the rim of glacial moraines and are mildly to moderately eroded. The Casco soils within the Site are found in steeper areas with slopes ranging from 12 to 20 percent (CeD2) and from 20 to 35 percent (CrE). The rate of runoff and potential for erosion is high in these soils.

Fox silt loam soils consist primarily of well-drained, loamy soils over calcareous sand and gravel outwash. The Fox soils found on the Site lie on gently sloping terrain ranging from 6 to 12 percent slopes and have a moderate potential for erosion and medium potential for runoff.

The Racine County hydric soils list indicates that Houghton muck is a hydric whole soil unit, while the list indicates that Radford silt loam has hydric inclusions of wetter soils. Houghton muck is also listed as hydric in *Hydric Soils of the United States,* a USDA Natural Resources Conservation Service publication.

1.2 Goals and Objectives

The primary construction goals established for the Baumeister wetland mitigation site were coordinated with the WDNR and focused on restoration of prior-converted wetlands to native wetland plant communities.

- The primary functional goals for the wetland mitigation site include:

    1) improve quality of water flowing into Bohner Lake
    2) expand the existing primary environmental corridor
    3) increase the amount and quality of wildlife habitat within the region

Specific goals developed during the design phase for the wetland mitigation site included:

- increase the level of significance for wetland functional values such as wildlife habitat, water quality, shoreline protection, aesthetics, and floral diversity by restoring the native plant communities (wet meadow, shallow marsh, deep marsh and tall grass prairie)

- enhance the value of wildlife habitat by managing vegetation to increase floral species diversity and decrease the area dominated by invasive species

- Provide habitat for grassland birds that are species of management concern (WDNR 1997).

The primary long-term objective for the Site is to establish a self-sustaining wetland by restoring an area of prior converted wetland to wet meadow, shallow marsh and deep marsh. Specific criteria for plant community establishment are as follows:

- At least 50 percent cover by desirable hydrophytic species by the 5th year following construction
- Establishment of at least 80 percent of the estimated wetland acreage shown in the plan
- At least 75 percent native species cover by the 5th year following construction

Criteria for success of the existing wetland management areas are as follows:

- elimination of all fruiting buckthorn and honeysuckle shrubs
- net reduction of the total areal coverage of reed canary grass by a minimum of 25%

In accordance with the Plans and Special Provisions (Exhibits 2 and 3, respectively), mitigation site construction began in September 2006 with drain tile disablement, followed by rootstock planting and seeding (Table 1). Site construction was completed in November 2006.

2.0 METHODS

2.1 Vegetation

Sampling of the Baumeister Site occurred on 9/4 and 9/19 of 2008, and 8/19 and 8/21 in 2009. Plant species were identified and cover calculated using the line-intercept method. This method is useful for sampling grasses and sedges where individual counts can be tedious. Three transects were run across the Site (Figure 4). Plant species were identified starting at 0 meters and then every 20 meters along each transect. Cover, or the amount of physical space a given plant occupies, was measured in the following manner: a meter tape was laid on the transect line, and using the transect point as zero, plants were sampled from 1 to 2 meters and from 3 to 4 meters on both sides of the transect. Any plant that intercepted the vertical projection of these segments of the line was identified and its cover was measured as the length of the meter tape intercepted. Plant cover was recorded to the nearest decimeter (10th of a meter) that each species intercepted the line. All plant species identified on the wetland site during monitoring activities are included in a cumulative wetland species list (Table 2).

Percent cover, relative percent cover, and relative percent frequency were calculated for each species found on all of the transect lines (Tables 3-6). Percent cover for each species was measured by summing all of the vegetative cover for each transect line and dividing by the total sample length. Relative percent cover was estimated by dividing the cover value for each species by the total cover values of all species. Relative percent frequency was estimated by dividing the frequency value for a species by the total frequency values for all species. Plant species were grouped and compared according to their percent relative cover, wetland indicator status, and seed source (native vs. non-native). In order to maintain consistency, all individuals that could only be identified to the level of genus were labeled as unknown when categorizing wetland indicator status, seed source, and life cycle. The following indicator status categories detail how plants were evaluated for their estimated probability of occurring in wetlands (Reed 1988):

Indicator Status	Indicator Status Symbol	Description
Obligate Wetland	OBL	almost always occurs in wetlands (estimated >99% probability) under natural conditions
Facultative Wetland (FACW)	FACW	usually occurs in wetlands (estimated 67-99% probability) but occasionally found in non-wetlands
Facultative (FAC)	FAC	equally likely to occur in wetlands (estimated 34-66% probability) or uplands
Facultative upland	FACU	usually occurs in non-wetlands, but occasionally

		found in wetlands (estimated 1-33% probability)
Obligate upland	UPL	almost never occurs in wetlands (estimated <1% probability)under natural conditions

A plus (+) or minus (-) symbol after a wetland indicator ranking shows a tendency toward the wetter or drier ranking, respectively. The indicator status rankings are based on the *National List of Plant Species that Occur in Wetlands: North Central (Region 3)* (Reed 1988).

2.2 Hydrology

Pre-construction hydrologic data included an engineering analysis to determine hydrology and depth to ground water. Monitoring wells were installed on site by WisDOT in 2003. A plan for restoration of wetland hydrology and the post-construction hydroperiod were developed based on the information gathered from the wells from April 2003 through September 2005. The site re-vegetation plan was then developed and based on the projected post-construction hydroperiod. Hydrology will be further assessed during the fifth monitoring year wetland delineation and as necessary if plant community response is noted to be insufficient during the monitoring period.

2.3 Wildlife

Although not a specified activity in the Army Corps of Engineers permit, casual wildlife observations were recorded during monitoring activities. All wildlife identified was noted in a field notebook. Though undoubtedly incomplete, the data collected provides some measure of wildlife usage of the parcel.

3.0 RESULTS

3.1 Vegetation

The cumulative list of plant species identified on this site totals 122 species, a 33% increase from the recorded 92 species in 2007 (Table 2). Monitoring data in 2009 showed a total of 68 species intercepted by transects a 20% increase from the total species (58) intercepted during the 2007 monitoring season (Table 3). An analysis of the species recorded during the sampling showed 72 percent perennials, 21 percent annuals with the remaining being biennials or a combination of the aforementioned. The total percent cover for all vegetation strata recorded in 2009 was 458.49% compared with 330.78% in 2007.

Species intercepted by the vegetation transects were ordered from the most abundant to the least abundant in Table 4. Based on relative percent cover for 2009, the ten species in greatest abundance were fowl-manna grass (*Glyceria striata*, 14.31%), rice cut-grass (*Leersia oryzoides*, 12.56%), black bulrush (*Scirpus atrovirens*, 5.41%), common sneezeweed (*Helenium autumnale*, 4.77%), brown fox sedge (*Carex vulpinoidea*, 3.86%), common fox sedge (*Carex stipata*, 3.85%), giant ragweed (*Ambrosia trifida*; 3.46%), Bebb's oval sedge (*Carex bebbii*, 3.38%), arrow-leaved tear thumb (*Polygonum sagittatum*, 3.26%), and boneset (*Eupatorium perfoliatum*, 3.03%). All are native, eight are perennials and all of the species are wetland indicator species. Two of these species were also in the top ten species of 2007; giant ragweed (13.04%) and rice cutgrass (6.89%).

In 2007, the top ten species included three native perennials, seven annuals, five non-native, and seven with a wetland indicator status of FAC or greater. Giant ragweed (*Ambrosia trifida*; 13.04%), yellow foxtail (*Setaria glauca*; 9.32%), eastern willow herb (*Epilobium coloratum*, 9.22%), water pepper (*Polygonum hydropiper,* 8.31%) green foxtail (*Setaria viridis*; 7.65%), common ragweed (*Ambrosia artemisiifolia*; 7.16%), giant foxtail (*Setaria faberi*; 4.71%), false nutsedge (*Cyperus strigosus*; 4.24%) and lady's thumb (*Polygonum persicaria*, 4.13).

Table 5 shows species intercepted by the vegetation transects and sorted by wetland indicator status. Twenty seven obligate wetland plants represent 66.65%, an increase of 11 species and more than a 50% increase in total relative cover from the 2007 (29.0%). Facultative wetland plants (FACW+, FACW and FACW-) stayed closer to the 2007 relative cover at 23.35% (20.55% in 2007). Facultative (FAC+ and FAC) plants totaled 7.05% (a decrease from 27.53%). In combination, these wetland indicator species accounted for 97.05% of the relative cover and this is an increase of 20% from the 2007 (77.08%) relative cover of vegetation sampled (Figures 5a and 5b).

Data was also sorted to examine the relative cover of native versus exotic (non-native) plant species (Table 6). Native vegetation consisted of 54 species and 91.68% of the vegetation intercepted by transects; this represents 36 percent increase in relative cover when compared with 2007 (55.63%). The most abundant percent cover native species in 2007 included giant ragweed (43.14%) which has decreased to 15.86%. Other notable changes from 2007 include a decrease in eastern willow-herb to 12.72% (30.49%); a decrease in common ragweed to 1.38% from 23.68% , an increase in rice cut-grass to 57.59% from 22.79%, and a notable decrease in false nutsedge to 0.09% from 14.02%. *Relative percent cover* for giant ragweed in 2007, 13.04%, is now decreased to 3.46% and common ragweed from 7.16% *relative cover* in 2007 to 0.30%. The top four species in 2009 for Relative Cover include *Glyceria striata*, at 14.31% from 0%, rice cut grass as noted above, an increase in black bulrush from 0.27% to 5.41%, and common sneezeweed from 0% to 4.77%. Of 54 native species intercepted during the 2009 vegetation sampling, 78% are perennials and 87% are wetland indicator species.

The *relative percent cover* of non-native species on the site (Figures 6a and 6b) showed a decrease to fourteen species accounting for only 8.32% cover down more than 36 percent when compared to the 2007 percent cover (44.37%). *Percent cover* of non-native species in 2007 showed yellow foxtail (30.83%), water pepper (*P. hydropiper*; 27.50%), green foxtail (25.29%), giant foxtail (15.59%), and lady's thumb (13.68%) as the five most abundant non-native species. Of these five species, only water-pepper remains in the top five species and it has decreased from 27.50% to 5.86% relative cover. The top five species in 2009 for *percent relative cover* are *Phalaris arundinacea* (reed canary grass), slightly increased to 2.06% from 0.28%; *Urtica dioica* (stinging nettle) at 1.92% from 3.50%; *Agrostis gigantea* (redtop) increased to 1.61% from 0.46%;. *Polygonum hydropiper* (water-pepper), increased from 1.28% to 1.61%; and *Daucus carota* (Queen Anne's lace) which demonstrated no significant change. Of the fourteen non-native species found on the site, 50% were perennials and 29% annuals.

Special conditions in the Army Corps of Engineers permit require that vegetation cover maps at a scale of 1 inch equals 400 feet, or larger scale, be prepared for each growing season; since the restoration zones within the site are very similar to the construction plans, the original construction plan is still valid for the cover map (Figure 3). Three wetland plant communities

are developing that include deep marsh, shallow marsh and wet meadow, as well as the upland tallgrass prairie.

The Army Corps of Engineers permit also includes a special condition that permanent photo-vantage points be established and representative photographs of the mitigation site be taken during the period between July 1 and September 30. Eight photo-vantage points were established and pictures were taken during the 2008-2009 growing season (Figures 4 and 7).

3.2 Hydrology

Meteorological data for the period from April through October (Table 7) indicates that precipitation was higher than average for the 2008 growing season and average for the 2009 growing season. A total of 30.47 inches were recorded in 2008, a surplus of 6 inches as compared to normal. In 2007 there was a recorded surplus of approximately 2 inches. A summary of precipitation for the growing season and yearly totals showed significantly higher than normal during 2008, an overall increase of 11 inches; however, just above average in 2009.

Average temperatures from April through October in 2008 and 2009 were somewhat warmer; however, there were no significant deviations from the normal. The average temperature during the growing season, 2008, was 71 degrees and in 2009, 69.6 degrees compared to the overall average of 69.3 degrees.

3.3 Wildlife

Observations made during the vegetation monitoring show that a number of animal species utilize the Site (Table 8). White-tailed deer (*Odocoileus virginianus),* a mammal, was sighted during field reviews as well as several amphibians including the American toad (*Bufo americanus*), green frog (*Rana clamitans)* and northern leopard frog (*Rana pipiens*). Invertebrates include the garden spider (*Argiope aurantia*), dragonflies to include green darner (*Anax junius*), skipper (*Hesperidae* family), and the tiger swallowtail (Papilio glaucas). Avifauna observed included great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), chimney swift (*Chaetura pelagic*), marsh wren (*Cistothorus palustris*), American crow (*Corvus brachyrhynchos*), common yellowthroat (*Geothlypis trichas*), barn swallow (*Hirundo rustica*) and wild turkey (*Meleagris gallopavo*). There are numerous wildlife utilizing the parcel as evidenced by tracks and habitat needs; however, individual wildlife surveys are not conducted as part of the monitoring process.

4.0 DISCUSSION

4.1 Vegetation

The primary goals established for the Site during the design phase were to improve the quality of runoff into tributaries by establishing dense vegetative cover, expanding the primary environmental corridor, and increasing the amount and quality of regional wildlife habitat. These goals were achieved through cessation of agricultural practices and expansion of wetland plant communities as habitat adjacent to the existing environmental corridor. The restored wetlands naturally function to provide soil stabilization, erosion deterrence, stormwater retention, and habitat value for a variety of species.

First-year monitoring results in 2007 indicated the Baumeister parcel had high vegetative cover

and diversity with a total vegetation cover for all strata of 330.78 %. Percent cover continues to increase and the 2009 percent cover is now at 458.49% with 0% bare ground. Of the ten most prevalent species, 100% are native, eighty percent are perennials, and all are wetland indicator species with seven of the 10 being Obligate. Of the two annuals, one is giant ragweed; however, this species has decreased from 13.04% relative cover in 2007 to 5.41% in 2008 and 3.46% in 2009 which indicates a steady decline as more desirable species become more established.

As noted earlier, native species account for 91.68% relative cover, an increase of 36% in two years (the 2007 cover was 55.63%). Of the total relative cover, 72% are perennials compared to the 2007 value of 63.4%; 21% are annuals. Sixty-eight species were intercepted on transects; and the overall number of cumulative species noted on-site increased to 122, an increase of 33%. The majority of the non-native species observed on the Site are typically found in abandoned agricultural areas. In terms of species richness, native vegetation dominates the site with 41 of the 58 species observed on the sample transects. Native flora is dominant and has increased to 91.68% and 54 species intercepted by transects. Only fourteen species comprise the non-native species intercepted during monitoring data collection.

Wetland indicator species, in combination, accounted for 97.05% of the relative cover and this is an increase of 20% from the 2007 (77.08%) relative cover of vegetation sampled. As noted earlier, 66.65% of the vegetation sampled are obligate wetland species totaling twenty-seven plants. This increase of 11 plants exemplifies the hydrology and favorable conditions on the site. Facultative wetland plants (FACW+, FACW and FACW-) stayed closer to the 2007 relative cover at 23.35% while facultative (FAC+ and FAC) plants decreased from 27.53% to 7.05%.

The high percentage of wetland indicator species (97.05% relative cover) indicates very favorable hydrologic conditions for establishment of wetland plant communities. The agricultural weed seed bank continues to demonstrate gradual depletion with increased competition from perennial native wetland species.

As documented by monitoring efforts and noted earlier, reed canary grass is the dominant non-native with 2.06% relative cover. This species is more concentrated along the edges of the parcel near the ditches and near the parcel entrance. In the other areas, reed canary grass is evidenced by small individual stands. Because infiltration of reed canary grass is a threat to native species diversity if allowed to spread, management activities target this species with the application of herbicides and/or mowing to inhibit spread. Efforts to control the other non-desirable non-native perennial, stinging nettle included mowing. This species is dominant near the perimeter and long the ditch banks.

4.2 Hydrology

As part of the design process, hydrology was assessed to determine what sources of water contribute to the Site and affect the shallow ground water table. This information is important in determining re-vegetation plans because the depth of the shallow water table positively correlates with distribution of wetland vegetation. The water table at the Site is high, resulting in soil saturation to the surface and ponding in depressional areas during normal precipitation. Even though the degree of soil saturation fluctuates somewhat following precipitation events, the shallow ground water table remains at a fairly consistent level because its primary water source

is from ground water discharge.

Relative stability of the Site hydrology supports the hydrophytic vegetation and continued success of the wetland restoration. Hydrology will be assessed further during the 5th year monitoring period as well.

4.3 Wildlife

Wildlife diversity will continue to increase with the succession of a variety of habitats; the density of vegetation and prolific seed production provides an abundance of food and cover for numerous species. The dense cover also makes it difficult to observe species that are more secretive and smaller in size. In addition to the species observed during vegetation monitoring visits, waterfowl species and sandhill cranes (*Grus canadensis*) were observed in and adjacent to the Site during construction. Other wildlife observed included eastern milk snake (*Lampropeltis triangulum*), common gartersnake (*Thamnophis sirtalis*), Canada goose (*Branta canadensis*), and a variety of common migratory songbirds. The presence of woodchuck and muskrat burrows near the streambank indicate the presence of both species.

As noted earlier, the number of animal species recorded during vegetation monitoring is misleading due to the infrequency of visits. These brief monitoring visits provided only limited opportunities to observe wildlife, resulting in little information regarding the presence of herptiles, invertebrates and waterfowl.

5.0 CONCLUSION

The Baumeister Wetland Mitigation Site shows is demonstrating the characteristics of a third-year mitigation site. Earlier dominant weedy species observed on the Site were typical for newly-restored abandoned agricultural areas. Non-native species are decreasing dramatically as native wetland vegetation dominates the Site. Hydrophytes which account for 97.05% of relative cover, is an objective indicator of both the hydrology and restoration success. Two-thirds of species intercepted by transects are obligate species. The established native vegetation is found in shallow marsh and fresh wet meadow wetlands. In terms of species richness, this restoration exemplifies the success of mitigation goals.

Annual weed species are expected to show a reduction in cover. Management goals will continue to focus on species that considered most threatening to the integrity of the restoration and established natives. This restoration has met our original commitments to the Lake Bohner Association to take the parcel out of agricultural production, disable drain tiles, and to restore it to wetland with native vegetation.

6.0 REFERENCES

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APPENDIX A:

Tables

Table 1. List of Species Planted at the Baumeister Wetland Mitigation Site

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS	OBSERVED ON SITE
SEED			
Wet Meadow Planting Zone			
Alisma triviale	water plantain	OBL	Yes
Angelica autropurpurea	pruple stemmed angelica	OBL	No
Asclepias incarnata	swamp-milkweed	OBL	Yes
Aster novae-angliae	New England aster	FACW	Yes
Aster puniceus	bristly aster	OBL	No
Calamagrostis canadensis	Canada bluejoint	OBL	No
Carex comosa	bottle brush sedge	OBL	Yes
Carex cristatella	crested oval sedge	OBL	No
Carex granularis	meadow sedge	FACW+	No
Carex hystericina	porcupine sedge	OBL	No
Carex scoparia	lance-fruited oval sedge	FACW	Yes
Carex stipata	common fox sedge	OBL	Yes
Carex vulpinoidea	brown fox sedge	OBL	Yes
Elymus canadensis	Canada wild rye	FAC-	No
Eupatorium maculatum	joe pye weed	OBL	Yes
Eupatorium perfoliatum	boneset	FACW+	Yes
Glyceria striata	fowl-mannagrass	OBL	Yes
Helenium autumnale	common sneezeweed	FACW+	Yes
Leersia oryzoides	rice cut-grass	OBL	Yes
Mimulus ringens	Allegheny monkey-flower	OBL	Yes
Scirpus atrovirens	black bulrush	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Solidago gigantea	smooth goldenrod	FACW	Yes
Thalictrum dasycarpum	purple meadow-rue	FACW-	No
Verbena hastata	common (blue) vervain	FACW+	Yes
Vernonia fasciculata	smooth ironweed	FACW	No
Shallow Marsh			
Alisma triviale	northern water plantair	OBL	Yes
Glyceria striata	fowl-mannagrass	OBL	Yes
Scirpus acutus	hardstem-bulrush	OBL	Yes
Scirpus cyperinus	common wool grass	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	No
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes
Zizania aquatica	wild rice	OBL	No
Tallgrass Prairie			
Andropogon gerardii	big bluestem	FAC-	No
Bouteloua curtipendula	side-oats gramma-grass	UPL	No
Desmodium canadense	Canadian tick-trefoil	FAC-	No
Echinacea purpurea	broad-leaved purple coneflower	UPL	No
Elymus canadensis	Canada wild rye	FAC-	Yes
Heliopsis helianthoides	sunflower-everlasting, false sunflower	UPL	No
Monarda fistulosa	wild bergamot	FACU	No
Panicum virgatum	switch grass	FAC+	No
Ratibida pinnata	globular coneflower	UPL	No
Rudbeckia hirta	black-eyed Susan	FACU	No
Schizachyrium scoparium	little bluestem	FACU-	No
Solidago rigida	stiff goldenrod	FACU-	No
Sorghastrum nutans	Indian grass	FACU+	No
Sporobolus heterolepis	prairie dropseed	FACU-	No
ROOTSTOCK			
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	No
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Scirpus validus	soft stem bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes

Table 2. Cumulative List of Plant Species Identified at the Baumeister Wetland Mitigation Site 2006-2009

1 *Abutilon theophrasti*
2 *Acer negundo*
3 *Achillea millefolium*
4 *Agalinis tenuifolia*
5 *Agrostis gigantea*
6 *Alisma triviale*
7 *Alliaria petiolata*
8 *Amaranthus hybridus*
9 *Ambrosia artemisiifolia*
Ambrosia trifida
Asclepias incarnata
Asclepias syriaca
Aster ericoides
Aster firmus
Aster lanceolatus
Aster novae-angliae
Aster pilosus
Barbarea vulgaris
Bidens cernua
Bidens comosa
Bidens frondosa
Bidens vulgata
Boehmeria cylindrica
Bromus inermis
Capsella bursa-pastoris
Carex bebbii
Carex comosa
Carex scoparia
Carex stipata
Carex vulpinoidea
Cerastium vulgatum
Chenopodium album
Cirsium arvense
Cirsium vulgare
Conus stolonifera
Conyza canadensis
Cornus racemosa
Cyperus bipartitus
Cyperus esculentus
Cyperus strigosus
Daucus carota
42 *Desmodium canadense*
43 *Dipsacus sylvestris*
44 *Echinochloa crusgalli*
45 *Echinocystis lobata*
46 *Eleocharis erythropoda*
47 *Elymus canadensis*
48 *Elytrigia repens*
49 *Epilobium coloratum*
50 *Erigeron strigosus*
51 *Eupatorium maculatum*
52 *Eupatorium perfoliatum*
53 *Euthamia graminifolia*
54 *Festuca elatior*
55 *Fraxinus pensylvanica*
56 *Geum aleppicum*
57 *Geum canadense*
58 *Glyceria grandis*
59 *Glyceria striata*
60 *Helenium autumnale*
61 *Hordeum jubatum*
62 *Impatiens capensis*
63 *Juncus effusus*
64 *Juncus tenuis*
65 *Juncus torreyi*
66 *Lactuca serriola*
67 *Leersia oryzoides*
68 *Lolium temulentum*
69 *Lycopus americanus*
70 *Melilotus alba*
71 *Mentha arvensis*
72 *Mimulus ringens*
73 *Muhlenbergia mexicana*
74 *Oenothera biennis*
75 *Panicum capillare*
76 *Panicum dichotomiflorum*
77 *Penthorum sedoides*
78 *Phalaris arundinacea*
79 *Phleum pratense*
80 *Pilea pumila*
81 *Plantago major*
82 *Poa palustris*
83 *Poa pratensis*
84 *Polygonum amphibium*
85 *Polygonum hydropiper*
86 *Polygonum hydropiperoides*
87 *Polygonum lapathifolium*
88 *Polygonum pensylvanicum*
89 *Polygonum persicaria*
90 *Polygonum sagittatum*
91 *Potentilla norvegica*
92 *Rhamnus cathartica*
93 *Rorippa palustris*
94 *Rumex crispus*
95 *Sagittaria latifolia*
96 *Salix discolor*
97 *Salix x rubens*
98 *Scirpus atrovirens*
99 *Scirpus cyperinus*
100 *Scirpus fluviatilis*
101 *Scirpus validus*
102 *Scutellaria lateriflora*
103 *Setaria faberi*
104 *Setaria glauca*
105 *Setaria viridis*
106 *Solidago canadensis*
107 *Solidago gigantea*
108 *Sonchus asper*
109 *Sonchus oleraceus*
110 *Sparganium eurycarpum*
111 *Stachys palustris*
112 *Taraxacum officinale*
113 *Thlaspi arvense*
114 *Trifolium hybridum*
115 *Trifolium pratense*
116 *Trifolium repens*
117 *Typha angustifolia*
118 *Typha latifolia*
119 *Ulmus americana*
120 *Urtica dioica*
121 *Verbena hastata*
122 *Verbena urticifolia*

Table 3. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Non-Vegetation													
Open Water	Other	Other	Other	Other	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**
Vegetation													
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.13%	0.02%	0.03%	0.72%	0.28%	0.15%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00%	0.07%	0.00%	0.00%	0.14%	0.00%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.46%	0.09%	1.61%	0.95%	0.14%	1.47%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00%	0.38%	0.11%	0.00%	0.14%	0.29%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.80%	0.00%	0.00%	1.19%	0.00%	0.00%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	7.16%	0.93%	0.30%	5.25%	1.54%	0.88%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.04%	5.41%	3.46%	6.92%	4.91%	3.37%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00%	0.10%	0.08%	0.00%	0.14%	0.15%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.01%	0.00%	0.00%	0.24%	0.00%	0.00%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	0.00%	0.05%	0.83%	0.00%	0.14%	2.05%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	0.00%	0.02%	0.25%	0.00%	0.14%	0.59%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	0.06%	0.21%	0.96%	0.24%	0.98%	2.20%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.00%	0.00%	0.06%	0.00%	0.00%	0.15%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.21%	0.38%	0.10%	0.48%	0.28%	0.29%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	1.30%	0.13%	0.40%	2.15%	0.42%	0.59%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00%	2.00%	0.91%	0.00%	2.38%	1.03%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	0.00%	1.82%	3.38%	0.00%	1.96%	3.52%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.00%	1.43%	2.74%	0.00%	0.98%	2.20%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.06%	0.00%	0.56%	0.24%	0.00%	0.44%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	0.00%	0.33%	3.85%	0.00%	0.42%	2.64%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	0.00%	1.61%	3.86%	0.00%	1.96%	3.08%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.22%	0.00%	0.00%	0.24%	0.00%	0.00%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.00%	0.09%	0.19%	0.00%	0.28%	0.44%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.90%	0.22%	0.13%	1.19%	0.70%	0.29%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	4.24%	0.86%	0.02%	4.53%	2.10%	0.15%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.39%	0.25%	0.36%	0.48%	0.70%	0.88%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.15%	0.00%	0.00%	0.24%	0.00%	0.00%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	1.33%	0.18%	0.04%	2.86%	0.70%	0.15%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00%	0.00%	0.14%	0.00%	0.00%	0.44%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	0.00%	0.00%	0.20%	0.00%	0.00%	0.44%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00%	0.09%	0.15%	0.00%	0.14%	0.29%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.22%	14.21%	2.77%	6.68%	8.42%	3.23%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.03%	1.26%	0.21%	0.24%	2.81%	0.73%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 3. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	0.00%	0.10%	0.00%	0.00%	0.28%	0.00%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	2.61%	2.19%	3.03%	2.39%	2.52%	3.52%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	0.44%	0.33%	1.34%	0.72%	0.56%	1.76%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00%	0.01%	0.00%	0.00%	0.14%	0.00%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	0.00%	0.08%	0.00%	0.00%	0.14%	0.00%
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	0.00%	12.73%	14.31%	0.00%	6.31%	6.30%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	0.00%	3.25%	4.77%	0.00%	4.21%	4.40%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	0.01%	0.19%	1.10%	0.24%	0.28%	0.73%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	0.00%	0.55%	1.06%	0.00%	0.84%	1.17%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	6.89%	14.50%	12.56%	4.77%	6.73%	6.60%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	0.06%	0.42%	0.49%	0.72%	1.12%	1.91%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00%	0.00%	0.24%	0.00%	0.00%	0.29%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	0.00%	0.00%	0.17%	0.00%	0.00%	0.73%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.03%	1.79%	0.48%	0.24%	3.65%	1.32%
Muhlenbergia mexicana	wirestem-muhly	FACW	N	P	0.00	0.26	1.47	0.00%	0.07%	0.32%	0.00%	0.14%	0.29%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.28%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.07%	0.00%	0.00%	0.24%	0.00%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	1.69%	0.14%	0.00%	2.15%	0.14%	0.00%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.58%	1.48%	0.36%	0.95%	1.82%	0.59%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	0.28%	1.19%	2.06%	0.72%	1.40%	2.64%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	0.58%	0.00%	0.32%	0.48%	0.00%	0.29%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	0.00%	0.10%	2.84%	0.00%	0.14%	1.91%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	1.47%	2.52%	0.09%	0.95%	2.24%	0.15%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	0.27%	0.58%	1.39%	0.95%	1.26%	2.64%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	8.31%	1.05%	1.28%	5.25%	0.84%	1.17%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	0.10%	2.08%	0.00%	0.24%	1.54%	0.00%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.01%	0.95%	0.03%	0.24%	0.84%	0.15%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.49%	0.10%	0.00%	0.72%	0.42%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	4.13%	0.03%	0.00%	5.49%	0.14%	0.00%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	1.29%	2.38%	3.26%	1.43%	2.24%	2.79%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.04%	0.25%	0.17%	0.72%	1.12%	0.88%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	1.51%	1.74%	0.24%	3.10%	4.35%	1.32%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	0.01%	0.91%	2.22%	0.24%	0.98%	1.61%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00%	0.00%	0.05%	0.00%	0.00%	0.15%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	0.27%	7.03%	5.41%	0.72%	5.33%	4.55%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	0.00%	1.15%	2.21%	0.00%	1.26%	1.61%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	0.55%	1.35%	1.14%	0.72%	1.40%	1.17%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.11%	1.13%	0.76%	0.95%	1.54%	1.76%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	0.00%	0.08%	0.97%	0.00%	0.56%	1.91%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	4.71%	0.24%	0.00%	4.53%	0.42%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 3. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	9.32%	1.00%	0.16%	7.40%	1.40%	0.44%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	7.65%	0.03%	0.00%	7.40%	0.14%	0.00%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	0.03%	0.11%	0.35%	0.24%	0.56%	1.61%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	0.34%	0.25%	0.47%	0.95%	0.84%	1.17%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.09%	0.07%	0.06%	0.48%	0.28%	0.15%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	0.04%	0.28%	1.60%	0.24%	0.42%	1.32%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00%	0.03%	0.00%	0.00%	0.14%	0.00%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	0.00%	0.05%	0.05%	0.00%	0.14%	0.15%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.06%	0.00%	0.00%	0.24%	0.00%	0.00%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.50%	1.06%	1.92%	4.53%	2.38%	3.08%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	1.41%	1.63%	2.97%	2.63%	2.10%	3.37%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.16%	0.00%	0.00%	0.24%	0.00%	0.00%
Total Vegetation					**330.78**	**395.15**	**458.49**	**100.00%**	**99.96%**	**100.00%**	**100.00%**	**99.86%**	**100.00%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by decreasing percent relative cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Non-Vegetation													
Open Water	Other	Other	Other	Other	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**
Vegetation													
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	0.00%	12.73%	14.31%	0.00%	6.31%	6.30%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	6.89%	14.50%	12.56%	4.77%	6.73%	6.60%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	0.27%	7.03%	5.41%	0.72%	5.33%	4.55%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	0.00%	3.25%	4.77%	0.00%	4.21%	4.40%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	0.00%	1.61%	3.86%	0.00%	1.96%	3.08%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	0.00%	0.33%	3.85%	0.00%	0.42%	2.64%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.04%	5.41%	3.46%	6.92%	4.91%	3.37%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	0.00%	1.82%	3.38%	0.00%	1.96%	3.52%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	1.29%	2.38%	3.26%	1.43%	2.24%	2.79%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	2.61%	2.19%	3.03%	2.39%	2.52%	3.52%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	1.41%	1.63%	2.97%	2.63%	2.10%	3.37%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	0.00%	0.10%	2.84%	0.00%	0.14%	1.91%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.22%	14.21%	2.77%	6.68%	8.42%	3.23%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.00%	1.43%	2.74%	0.00%	0.98%	2.20%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	0.01%	0.91%	2.22%	0.24%	0.98%	1.61%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	0.00%	1.15%	2.21%	0.00%	1.26%	1.61%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	0.28%	1.19%	2.06%	0.72%	1.40%	2.64%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.50%	1.06%	1.92%	4.53%	2.38%	3.08%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.46%	0.09%	1.61%	0.95%	0.14%	1.47%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	0.04%	0.28%	1.60%	0.24%	0.42%	1.32%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	0.27%	0.58%	1.39%	0.95%	1.26%	2.64%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	0.44%	0.33%	1.34%	0.72%	0.56%	1.76%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	8.31%	1.05%	1.28%	5.25%	0.84%	1.17%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	0.55%	1.35%	1.14%	0.72%	1.40%	1.17%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	0.01%	0.19%	1.10%	0.24%	0.28%	0.73%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	0.00%	0.55%	1.06%	0.00%	0.84%	1.17%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	0.00%	0.08%	0.97%	0.00%	0.56%	1.91%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	0.06%	0.21%	0.96%	0.24%	0.98%	2.20%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00%	2.00%	0.91%	0.00%	2.38%	1.03%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	0.00%	0.05%	0.83%	0.00%	0.14%	2.05%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.11%	1.13%	0.76%	0.95%	1.54%	1.76%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.06%	0.00%	0.56%	0.24%	0.00%	0.44%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	0.06%	0.42%	0.49%	0.72%	1.12%	1.91%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.03%	1.79%	0.48%	0.24%	3.65%	1.32%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	0.34%	0.25%	0.47%	0.95%	0.84%	1.17%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	1.30%	0.13%	0.40%	2.15%	0.42%	0.59%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.58%	1.48%	0.36%	0.95%	1.82%	0.59%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.39%	0.25%	0.36%	0.48%	0.70%	0.88%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	0.03%	0.11%	0.35%	0.24%	0.56%	1.61%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	0.58%	0.00%	0.32%	0.48%	0.00%	0.29%
Muhlenbergia mexicana	wirestem-muhly	FACW	N	P	0.00	0.26	1.47	0.00%	0.07%	0.32%	0.00%	0.14%	0.29%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by decreasing percent relative cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	7.16%	0.93%	0.30%	5.25%	1.54%	0.88%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	0.00%	0.02%	0.25%	0.00%	0.14%	0.59%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	1.51%	1.74%	0.24%	3.10%	4.35%	1.32%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00%	0.00%	0.24%	0.00%	0.00%	0.29%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.03%	1.26%	0.21%	0.24%	2.81%	0.73%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	0.00%	0.00%	0.20%	0.00%	0.00%	0.44%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.00%	0.09%	0.19%	0.00%	0.28%	0.44%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.04%	0.25%	0.17%	0.72%	1.12%	0.88%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	0.00%	0.00%	0.17%	0.00%	0.00%	0.73%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	9.32%	1.00%	0.16%	7.40%	1.40%	0.44%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00%	0.09%	0.15%	0.00%	0.14%	0.29%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00%	0.00%	0.14%	0.00%	0.00%	0.44%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.90%	0.22%	0.13%	1.19%	0.70%	0.29%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00%	0.38%	0.11%	0.00%	0.14%	0.29%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.21%	0.38%	0.10%	0.48%	0.28%	0.29%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	1.47%	2.52%	0.09%	0.95%	2.24%	0.15%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00%	0.10%	0.08%	0.00%	0.14%	0.15%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.09%	0.07%	0.06%	0.48%	0.28%	0.15%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.00%	0.00%	0.06%	0.00%	0.00%	0.15%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	0.00%	0.05%	0.05%	0.00%	0.14%	0.15%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00%	0.00%	0.05%	0.00%	0.00%	0.15%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	1.33%	0.18%	0.04%	2.86%	0.70%	0.15%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.13%	0.02%	0.03%	0.72%	0.28%	0.15%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.01%	0.95%	0.03%	0.24%	0.84%	0.15%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	4.24%	0.86%	0.02%	4.53%	2.10%	0.15%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	7.65%	0.03%	0.00%	7.40%	0.14%	0.00%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	4.71%	0.24%	0.00%	4.53%	0.42%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	4.13%	0.03%	0.00%	5.49%	0.14%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	1.69%	0.14%	0.00%	2.15%	0.14%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.80%	0.00%	0.00%	1.19%	0.00%	0.00%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.49%	0.10%	0.00%	0.72%	0.42%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.22%	0.00%	0.00%	0.24%	0.00%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.16%	0.00%	0.00%	0.24%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.15%	0.00%	0.00%	0.24%	0.00%	0.00%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	0.10%	2.08%	0.00%	0.24%	1.54%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.07%	0.00%	0.00%	0.24%	0.00%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.06%	0.00%	0.00%	0.24%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.01%	0.00%	0.00%	0.24%	0.00%	0.00%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	0.00%	0.10%	0.00%	0.00%	0.28%	0.00%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by decreasing percent relative cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	0.00%	0.08%	0.00%	0.00%	0.14%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00%	0.07%	0.00%	0.00%	0.14%	0.00%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.28%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00%	0.03%	0.00%	0.00%	0.14%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00%	0.01%	0.00%	0.00%	0.14%	0.00%
Total Vegetation					**330.78**	**395.15**	**458.49**	**100.00%**	**99.96%**	**100.00%**	**100.00%**	**99.86%**	**100.00%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Non-Vegetation													
Open Water	Other	Other	Other	Other	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**
Obligate Wetland Vegetation (OBL)													
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	0.00%	12.73%	14.31%	0.00%	6.31%	6.30%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	6.89%	14.50%	12.56%	4.77%	6.73%	6.60%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	0.27%	7.03%	5.41%	0.72%	5.33%	4.55%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	0.00%	1.61%	3.86%	0.00%	1.96%	3.08%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	0.00%	0.33%	3.85%	0.00%	0.42%	2.64%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	0.00%	1.82%	3.38%	0.00%	1.96%	3.52%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	1.29%	2.38%	3.26%	1.43%	2.24%	2.79%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.22%	14.21%	2.77%	6.68%	8.42%	3.23%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.00%	1.43%	2.74%	0.00%	0.98%	2.20%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	0.01%	0.91%	2.22%	0.24%	0.98%	1.61%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	0.00%	1.15%	2.21%	0.00%	1.26%	1.61%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	0.04%	0.28%	1.60%	0.24%	0.42%	1.32%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	0.27%	0.58%	1.39%	0.95%	1.26%	2.64%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	8.31%	1.05%	1.28%	5.25%	0.84%	1.17%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	0.55%	1.35%	1.14%	0.72%	1.40%	1.17%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	0.00%	0.08%	0.97%	0.00%	0.56%	1.91%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	0.00%	0.05%	0.83%	0.00%	0.14%	2.05%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.11%	1.13%	0.76%	0.95%	1.54%	1.76%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	0.06%	0.42%	0.49%	0.72%	1.12%	1.91%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.03%	1.79%	0.48%	0.24%	3.65%	1.32%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.58%	1.48%	0.36%	0.95%	1.82%	0.59%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	0.00%	0.02%	0.25%	0.00%	0.14%	0.59%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	0.00%	0.00%	0.20%	0.00%	0.00%	0.44%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00%	0.38%	0.11%	0.00%	0.14%	0.29%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.21%	0.38%	0.10%	0.48%	0.28%	0.29%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00%	0.10%	0.08%	0.00%	0.14%	0.15%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	0.00%	0.05%	0.05%	0.00%	0.14%	0.15%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	0.10%	2.08%	0.00%	0.24%	1.54%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.06%	0.00%	0.00%	0.24%	0.00%	0.00%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	0.00%	0.10%	0.00%	0.00%	0.28%	0.00%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	0.00%	0.08%	0.00%	0.00%	0.14%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00%	0.03%	0.00%	0.00%	0.14%	0.00%
Total Obligate Wetland Vegetation					**95.93**	**275.93**	**305.60**	**29.00%**	**69.80%**	**66.65%**	**24.82%**	**52.73%**	**55.87%**
Facultative Wetland Vegetation (FACW+, FACW, FACW-)													
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	0.00%	3.25%	4.77%	0.00%	4.21%	4.40%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	2.61%	2.19%	3.03%	2.39%	2.52%	3.52%

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	1.41%	1.63%	2.97%	2.63%	2.10%	3.37%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	0.00%	0.10%	2.84%	0.00%	0.14%	1.91%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	0.28%	1.19%	2.06%	0.72%	1.40%	2.64%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.46%	0.09%	1.61%	0.95%	0.14%	1.47%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	0.44%	0.33%	1.34%	0.72%	0.56%	1.76%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	0.01%	0.19%	1.10%	0.24%	0.28%	0.73%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	0.06%	0.21%	0.96%	0.24%	0.98%	2.20%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.06%	0.00%	0.56%	0.24%	0.00%	0.44%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	0.34%	0.25%	0.47%	0.95%	0.84%	1.17%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	1.30%	0.13%	0.40%	2.15%	0.42%	0.59%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	0.58%	0.00%	0.32%	0.48%	0.00%	0.29%
Muhlenbergia mexicana	wirestem-muhly	FACW	N	P	0.00	0.26	1.47	0.00%	0.07%	0.32%	0.00%	0.14%	0.29%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	0.00%	0.00%	0.17%	0.00%	0.00%	0.73%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00%	0.00%	0.14%	0.00%	0.00%	0.44%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.90%	0.22%	0.13%	1.19%	0.70%	0.29%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00%	0.00%	0.05%	0.00%	0.00%	0.15%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	1.33%	0.18%	0.04%	2.86%	0.70%	0.15%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.01%	0.95%	0.03%	0.24%	0.84%	0.15%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.13%	0.02%	0.03%	0.72%	0.28%	0.15%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	4.24%	0.86%	0.02%	4.53%	2.10%	0.15%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.49%	0.10%	0.00%	0.72%	0.42%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	1.69%	0.14%	0.00%	2.15%	0.14%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	4.13%	0.03%	0.00%	5.49%	0.14%	0.00%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00%	0.07%	0.00%	0.00%	0.14%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Total Facultative Wetland Vegetation					**67.99**	**48.54**	**107.07**	**20.55%**	**12.28%**	**23.35%**	**30.07%**	**19.50%**	**26.98%**
Facultative Wetland Vegetation (FAC+, FAC)													
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.04%	5.41%	3.46%	6.92%	4.91%	3.37%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.50%	1.06%	1.92%	4.53%	2.38%	3.08%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	0.00%	0.55%	1.06%	0.00%	0.84%	1.17%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	1.51%	1.74%	0.24%	3.10%	4.35%	1.32%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.04%	0.25%	0.17%	0.72%	1.12%	0.88%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	9.32%	1.00%	0.16%	7.40%	1.40%	0.44%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00%	0.01%	0.00%	0.00%	0.14%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.07%	0.00%	0.00%	0.24%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Total Facultative Wetland Vegetation (FAC+, FAC)					**91.08**	**39.66**	**32.33**	**27.53%**	**10.03%**	**7.05%**	**23.15%**	**15.29%**	**10.41%**
Facultative - Vegetation (FAC-)													
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.03%	1.26%	0.21%	0.24%	2.81%	0.73%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00%	0.09%	0.15%	0.00%	0.14%	0.29%

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	1.47%	2.52%	0.09%	0.95%	2.24%	0.15%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	7.65%	0.03%	0.00%	7.40%	0.14%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.22%	0.00%	0.00%	0.24%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Total Facultative (-) Vegetation					**31.13**	**15.45**	**2.07**	**9.41%**	**3.91%**	**0.45%**	**9.07%**	**5.33%**	**1.17%**
Facultative Upland Vegetation (FACU+, FACU, FACU-)													
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00%	2.00%	0.91%	0.00%	2.38%	1.03%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	0.03%	0.11%	0.35%	0.24%	0.56%	1.61%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	7.16%	0.93%	0.30%	5.25%	1.54%	0.88%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00%	0.00%	0.24%	0.00%	0.00%	0.29%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.00%	0.00%	0.06%	0.00%	0.00%	0.15%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.09%	0.07%	0.06%	0.48%	0.28%	0.15%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	4.71%	0.24%	0.00%	4.53%	0.42%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.01%	0.00%	0.00%	0.24%	0.00%	0.00%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.28%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Total Facultative Upland Vegetation					**39.71**	**13.84**	**8.92**	**12.00%**	**3.50%**	**1.95%**	**10.74%**	**5.89%**	**4.25%**
Upland Vegetation (UPL)													
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.39%	0.25%	0.36%	0.48%	0.70%	0.88%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.00%	0.09%	0.19%	0.00%	0.28%	0.44%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.80%	0.00%	0.00%	1.19%	0.00%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.16%	0.00%	0.00%	0.24%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.15%	0.00%	0.00%	0.24%	0.00%	0.00%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Total Upland Vegetation					**4.95**	**1.72**	**2.50**	**1.50%**	**0.43%**	**0.55%**	**2.15%**	**1.12%**	**1.32%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by origin)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Non-Vegetation													
Open Water	Other	Other	Other	Other	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	Other	Other	Other	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**
Native Vegetation													
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	0.00%	12.73%	14.31%	0.00%	6.31%	6.30%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	6.89%	14.50%	12.56%	4.77%	6.73%	6.60%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	0.27%	7.03%	5.41%	0.72%	5.33%	4.55%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	0.00%	3.25%	4.77%	0.00%	4.21%	4.40%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	0.00%	1.61%	3.86%	0.00%	1.96%	3.08%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	0.00%	0.33%	3.85%	0.00%	0.42%	2.64%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.04%	5.41%	3.46%	6.92%	4.91%	3.37%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	0.00%	1.82%	3.38%	0.00%	1.96%	3.52%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	1.29%	2.38%	3.26%	1.43%	2.24%	2.79%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	2.61%	2.19%	3.03%	2.39%	2.52%	3.52%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	1.41%	1.63%	2.97%	2.63%	2.10%	3.37%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	0.00%	0.10%	2.84%	0.00%	0.14%	1.91%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.22%	14.21%	2.77%	6.68%	8.42%	3.23%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.00%	1.43%	2.74%	0.00%	0.98%	2.20%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	0.01%	0.91%	2.22%	0.24%	0.98%	1.61%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	0.00%	1.15%	2.21%	0.00%	1.26%	1.61%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	0.04%	0.28%	1.60%	0.24%	0.42%	1.32%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	0.27%	0.58%	1.39%	0.95%	1.26%	2.64%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	0.44%	0.33%	1.34%	0.72%	0.56%	1.76%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	0.55%	1.35%	1.14%	0.72%	1.40%	1.17%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	0.01%	0.19%	1.10%	0.24%	0.28%	0.73%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	0.00%	0.55%	1.06%	0.00%	0.84%	1.17%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	0.00%	0.08%	0.97%	0.00%	0.56%	1.91%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	0.06%	0.21%	0.96%	0.24%	0.98%	2.20%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00%	2.00%	0.91%	0.00%	2.38%	1.03%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	0.00%	0.05%	0.83%	0.00%	0.14%	2.05%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.11%	1.13%	0.76%	0.95%	1.54%	1.76%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.06%	0.00%	0.56%	0.24%	0.00%	0.44%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	0.06%	0.42%	0.49%	0.72%	1.12%	1.91%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.03%	1.79%	0.48%	0.24%	3.65%	1.32%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	0.34%	0.25%	0.47%	0.95%	0.84%	1.17%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	1.30%	0.13%	0.40%	2.15%	0.42%	0.59%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.58%	1.48%	0.36%	0.95%	1.82%	0.59%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	0.03%	0.11%	0.35%	0.24%	0.56%	1.61%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	0.58%	0.00%	0.32%	0.48%	0.00%	0.29%
Muhlenbergia mexicana	wirestem-muhly	FACW	N	P	0.00	0.26	1.47	0.00%	0.07%	0.32%	0.00%	0.14%	0.29%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	7.16%	0.93%	0.30%	5.25%	1.54%	0.88%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	0.00%	0.02%	0.25%	0.00%	0.14%	0.59%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.03%	1.26%	0.21%	0.24%	2.81%	0.73%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	0.00%	0.00%	0.20%	0.00%	0.00%	0.44%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.04%	0.25%	0.17%	0.72%	1.12%	0.88%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by origin)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	0.00%	0.00%	0.17%	0.00%	0.00%	0.73%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00%	0.09%	0.15%	0.00%	0.14%	0.29%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00%	0.00%	0.14%	0.00%	0.00%	0.44%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.90%	0.22%	0.13%	1.19%	0.70%	0.29%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00%	0.38%	0.11%	0.00%	0.14%	0.29%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.21%	0.38%	0.10%	0.48%	0.28%	0.29%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00%	0.10%	0.08%	0.00%	0.14%	0.15%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.00%	0.00%	0.06%	0.00%	0.00%	0.15%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	0.00%	0.05%	0.05%	0.00%	0.14%	0.15%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.13%	0.02%	0.03%	0.72%	0.28%	0.15%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.01%	0.95%	0.03%	0.24%	0.84%	0.15%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	4.24%	0.86%	0.02%	4.53%	2.10%	0.15%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	1.69%	0.14%	0.00%	2.15%	0.14%	0.00%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.49%	0.10%	0.00%	0.72%	0.42%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.16%	0.00%	0.00%	0.24%	0.00%	0.00%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	0.10%	2.08%	0.00%	0.24%	1.54%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.07%	0.00%	0.00%	0.24%	0.00%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.06%	0.00%	0.00%	0.24%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.03%	0.00%	0.00%	0.24%	0.00%	0.00%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.01%	0.00%	0.00%	0.24%	0.00%	0.00%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	0.00%	0.10%	0.00%	0.00%	0.28%	0.00%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	0.00%	0.08%	0.00%	0.00%	0.14%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00%	0.07%	0.00%	0.00%	0.14%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.28%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00%	0.04%	0.00%	0.00%	0.14%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00%	0.03%	0.00%	0.00%	0.14%	0.00%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00%	0.01%	0.00%	0.00%	0.14%	0.00%
Total Native Vegetation					**184.02**	**356.60**	**420.34**	**55.63%**	**90.21%**	**91.68%**	**53.94%**	**83.73%**	**87.54%**
Non-Native Vegetation													
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	0.28%	1.19%	2.06%	0.72%	1.40%	2.64%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.50%	1.06%	1.92%	4.53%	2.38%	3.08%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.46%	0.09%	1.61%	0.95%	0.14%	1.47%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	8.31%	1.05%	1.28%	5.25%	0.84%	1.17%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.39%	0.25%	0.36%	0.48%	0.70%	0.88%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	1.51%	1.74%	0.24%	3.10%	4.35%	1.32%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00%	0.00%	0.24%	0.00%	0.00%	0.29%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.00%	0.09%	0.19%	0.00%	0.28%	0.44%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	9.32%	1.00%	0.16%	7.40%	1.40%	0.44%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	1.47%	2.52%	0.09%	0.95%	2.24%	0.15%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.09%	0.07%	0.06%	0.48%	0.28%	0.15%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2009 Vegetation Survey (sorted by origin)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover			Relative Cover			Relative Frequency		
					2007	2008	2009	2007	2008	2009	2007	2008	2009
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00%	0.00%	0.05%	0.00%	0.00%	0.15%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	1.33%	0.18%	0.04%	2.86%	0.70%	0.15%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00%	0.00%	0.04%	0.00%	0.00%	0.15%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	7.65%	0.03%	0.00%	7.40%	0.14%	0.00%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	4.71%	0.24%	0.00%	4.53%	0.42%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	4.13%	0.03%	0.00%	5.49%	0.14%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.80%	0.00%	0.00%	1.19%	0.00%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.22%	0.00%	0.00%	0.24%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.15%	0.00%	0.00%	0.24%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.04%	0.00%	0.00%	0.24%	0.00%	0.00%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00%	0.09%	0.00%	0.00%	0.14%	0.00%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00%	0.05%	0.00%	0.00%	0.14%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%
Total Non-Native Vegetation					**146.76**	**38.54**	**38.15**	**44.37%**	**9.75%**	**8.32%**	**46.06%**	**16.13%**	**12.46%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 7. Meteorological Data for the Baumeister Wetland Mitigation Site (2009)

Normals based on data from National Climate Data Center (Burlington, Wisconsin)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Precipitation (in.)													
Normal	1.25	1.13	2.02	3.40	3.18	3.78	3.54	4.64	3.37	2.59	2.48	1.74	**33.12**
2007	0.86	1.36	3.21	4.03	1.99	3.64	1.40	7.92	1.93	2.96	0.04	N/A	**29.34**
2008	2.07	3.32	3.11	4.42	2.92	12.27	3.20	0.88	4.16	2.62	1.47	4.00	**44.44**
2009	0.97	2.31	3.68	4.50	2.56	5.44	0.71	4.04	1.57	5.57	1.80	0.91X	**34.06 X**
Average Temperature (F)													
Normal	18.0	23.5	32.6	44.6	56.5	65.6	70.6	68.5	60.7	49.5	35.9	23.8	**43.20**
2007	23.0	12.4	35.0	42.5	59.5	67.8	69.2	69.6	62.8	54.5	34.7	N/A	**48.3***
2008	22.4	22.0	32.5	46.2	53.1	66.8	71.3	71.0	65.2	52.1	38.8	22.4	**44.29**
2009	15.8	27.1	36.1	45.1	57.2	65.1	68.6	68.8	63.9	48.3	45.2	31.3X	**44.96 X**

Notes:

N/A = Data not available

X = Monthly means or totals based on incomplete time series; 1-9 days missing.

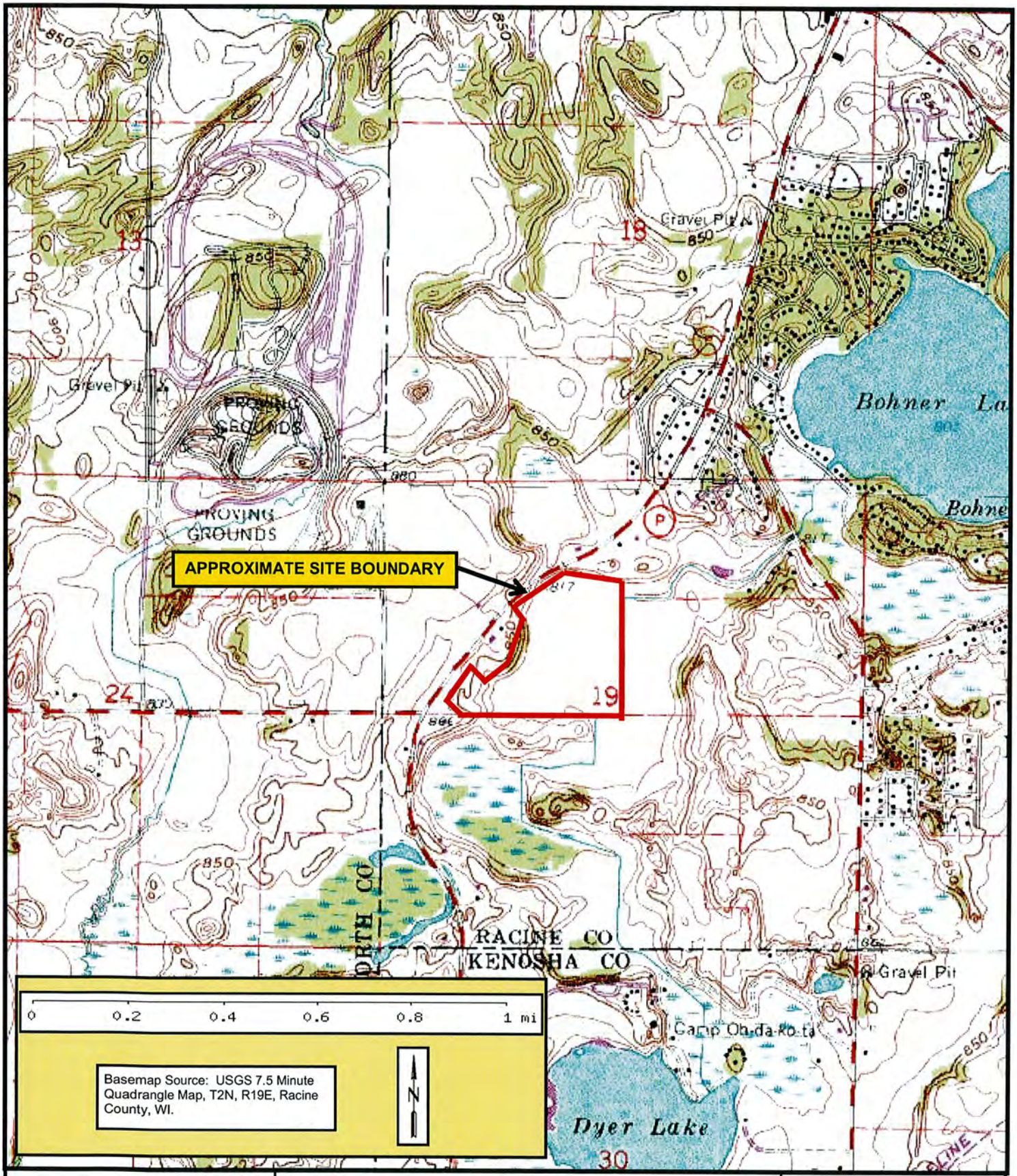
* Does not include data from December

Table 8. List of Wildlife Species Observed at the Baumeister Wetland Mitigation Site 2007-2009

Scientific Name	Common Name	Evidence
Invertebrates		
Anax junius	green darner	visual
Argiope aurantia	garden spider	visual
Hesperiidae (Family)	skipper	visual
Papilio glaucas	tiger swallowtail	visual
Amphibians		
Bufo americanus	American toad	visual
Lampropeltis triangulum	milk snake	visual
Rana clamitans	green frog	visual
Rana pipiens	Northern Leopard Frog	visual
Thamnophis sirtalis	gartersnake	visual
Birds		
Ardea herodias	great blue heron	visual
Branta canadensis	Canada goose	visual
Buteo jamaicensis	red-tailed hawk	visual
Chaetura pelagica	chimney swift	visual
Cistothorus palustris	marsh wren	visual
Corvus brachyrhynchos	American crow	visual
Geothlypis trichas	common yellowthroat	visual
Grus canadensis	sandhill crane	visual
Hirundo rustica	barn swallow	visual
Meleagris gallopavo	Wild turkey	visual
Mammals		
Odocoileus virginianus	whitetail deer	tracks

APPENDIX B:

Figures

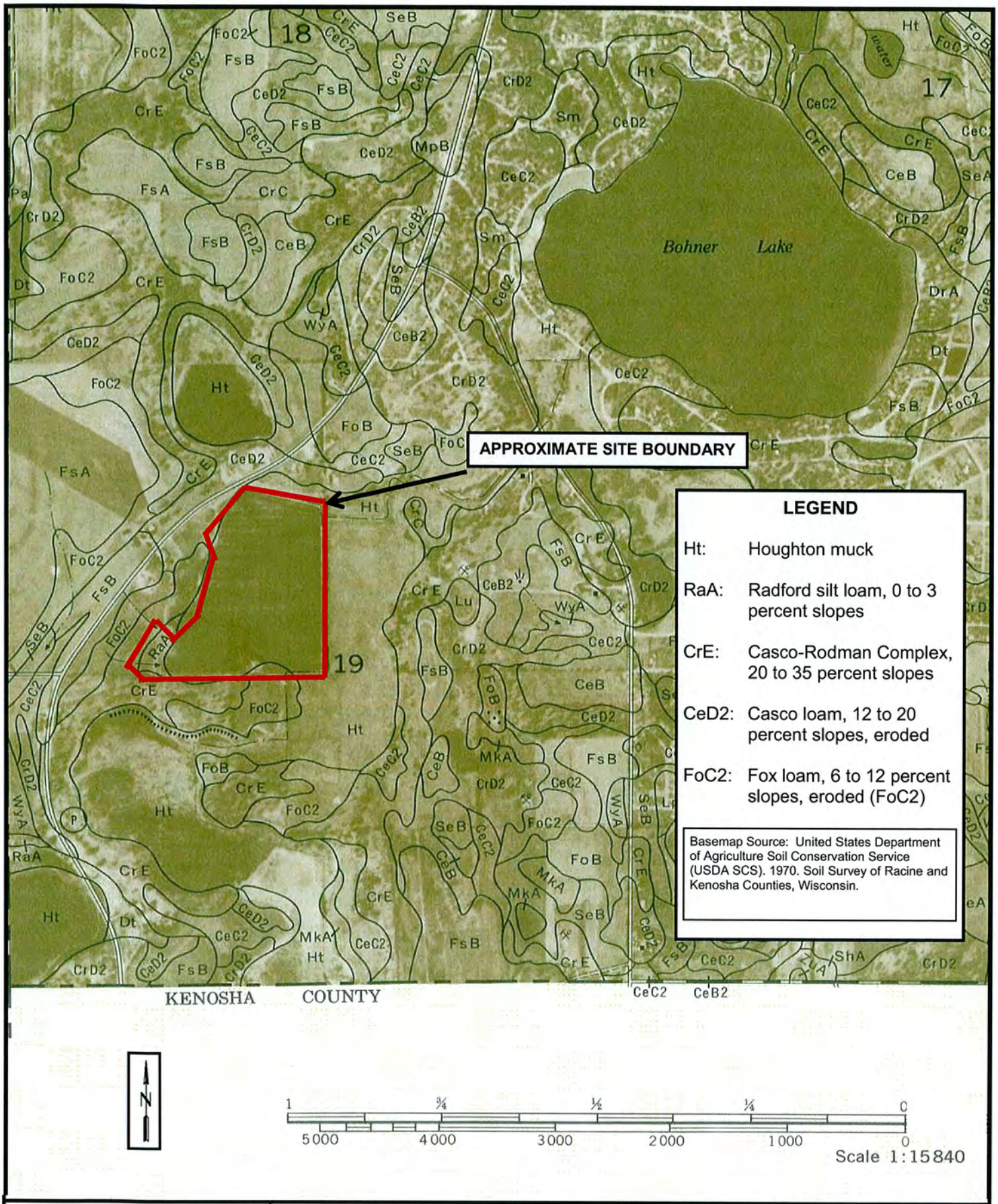


TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 1: PROJECT LOCATION

FILE NAME: FIGURE_05.DWG

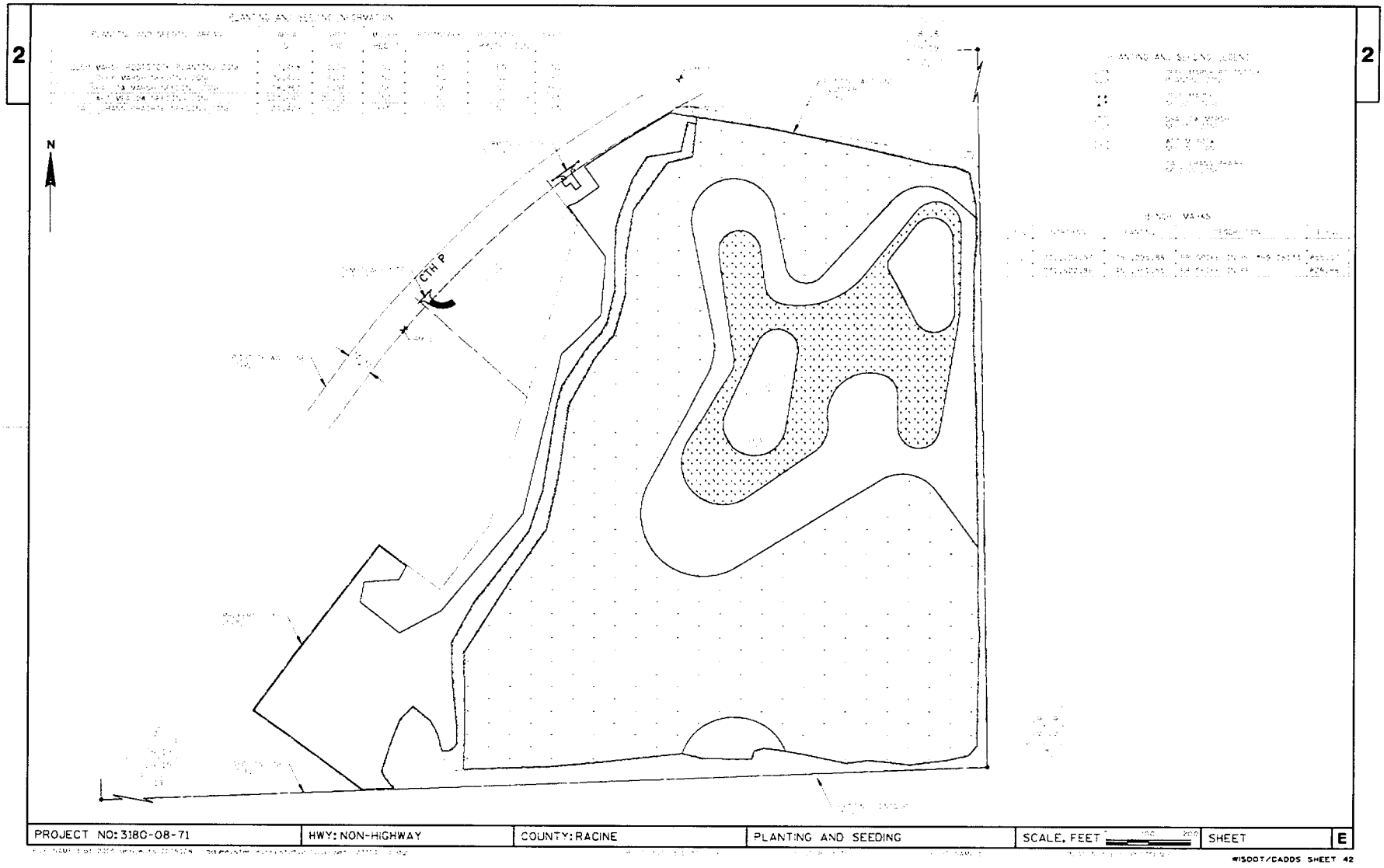


TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 2:
SOILS MAP

FILE NAME: FIGURE_05.DWG

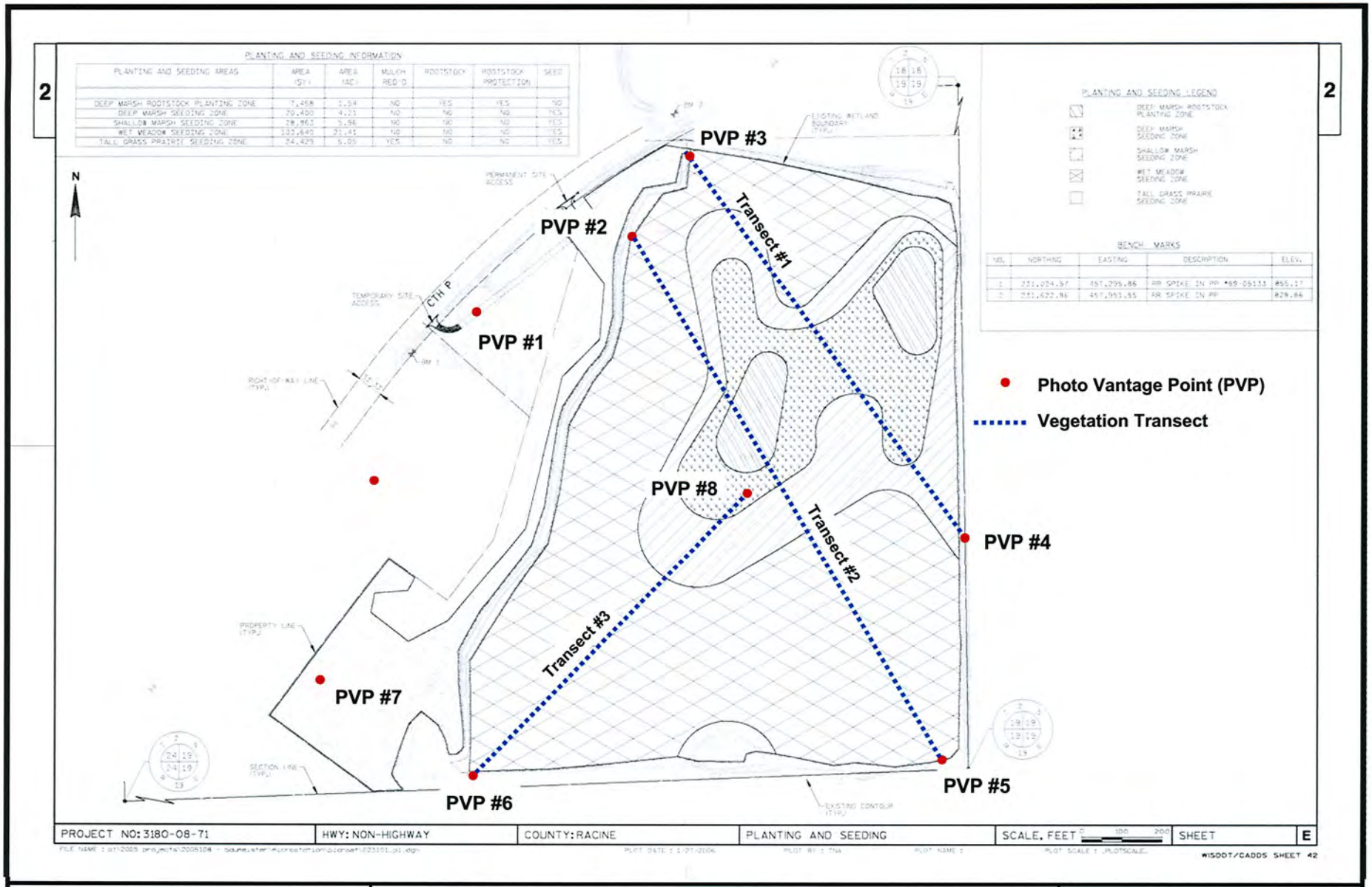


TN & A T N & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 3: VEGETATION PLANTING ZONES

FILE NAME: FIGURE_05.DWG



TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 4:
PHOTO VANTAGE POINTS AND VEGETATON TRANSECT LOCATIONS

FILE NAME: FIGURE_05.DWG

Figure 5a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Wetland Indicator Status (2007-2009)

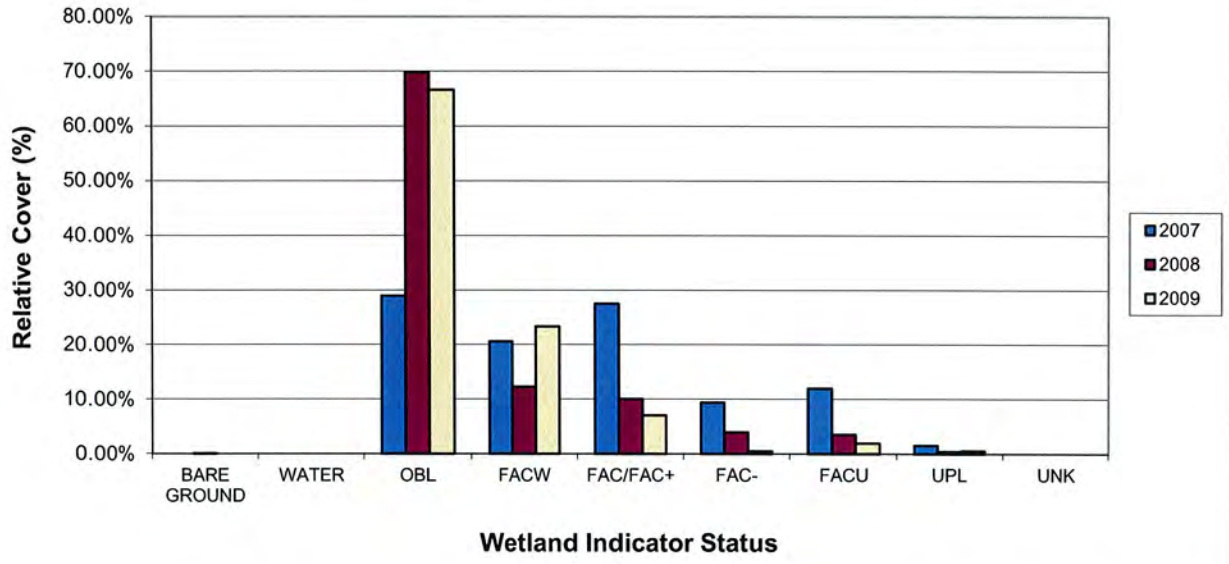


Figure 5b: Vegetation Comparison of the Baumeister Wetland Mitigaiton Site
Relative Frequency vs. Wetland Indicator Status (2007-2009)

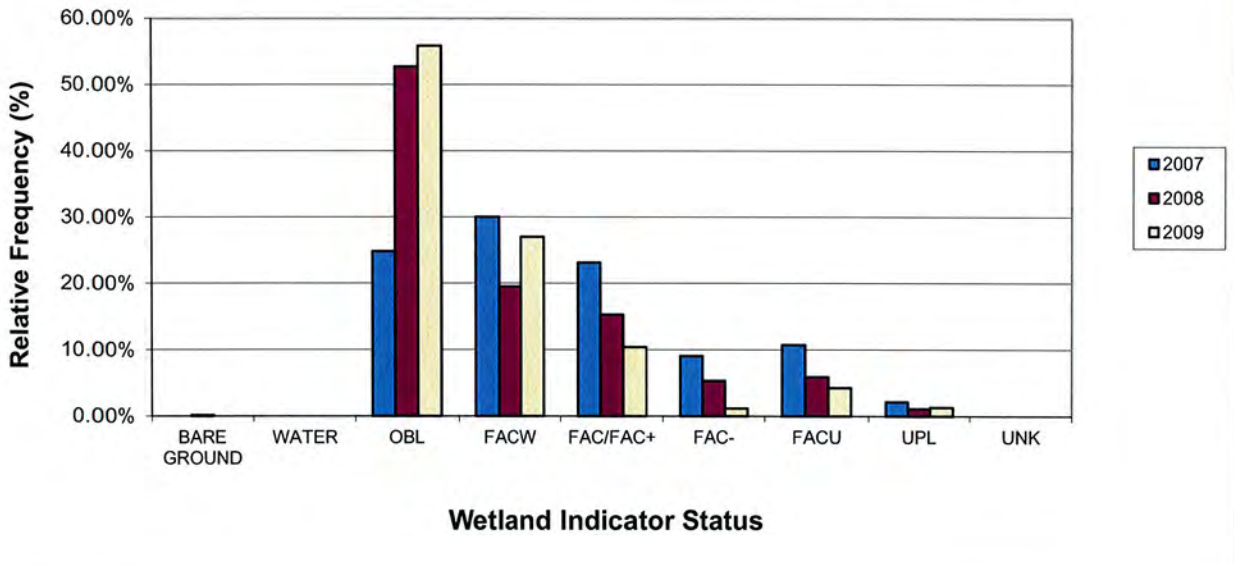


Figure 6a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Origin (2007-2009)

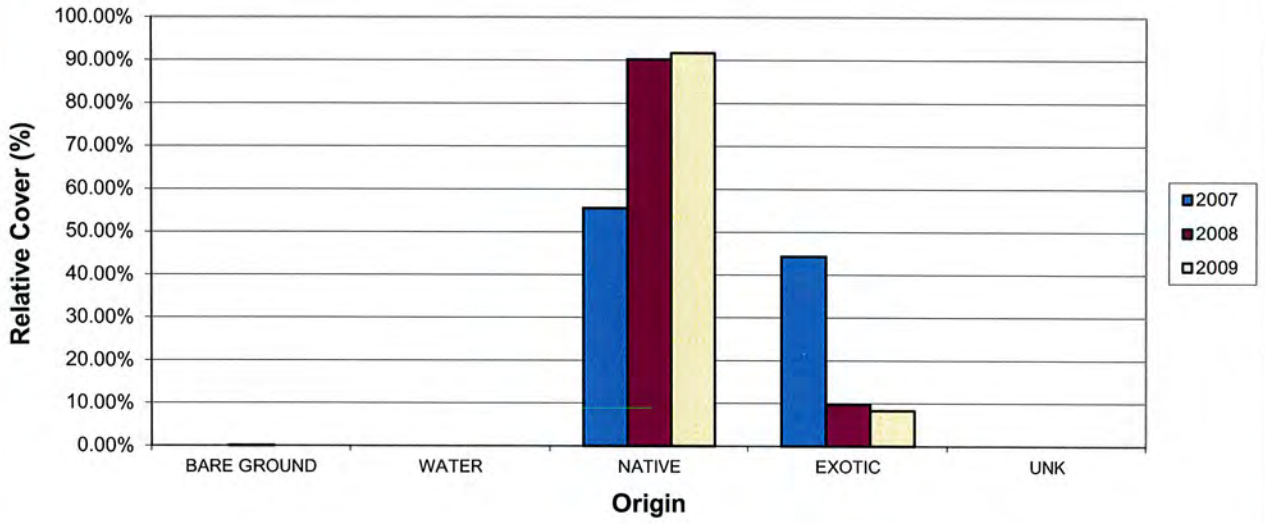


Figure 6b: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Frequency vs. Origin (2007-2009)

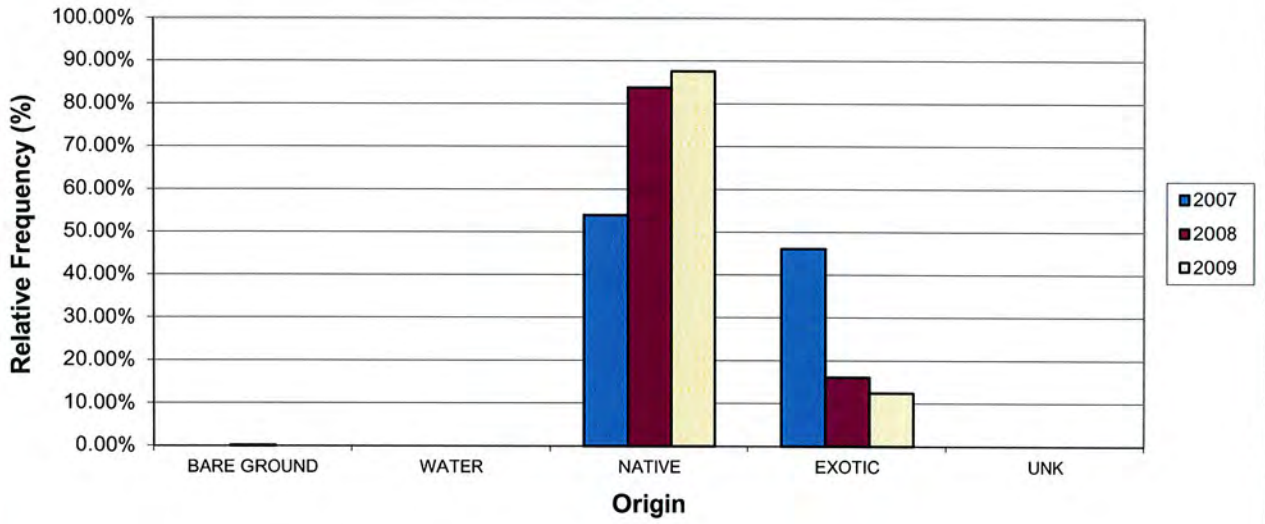


Figure 7
Page 1 of 4

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 1. PVP #1 facing southeast (8/21/09). Restoration site dominated by native planted species such as fowl manna grass, rice cut grass and black bulrush.



Photograph 2. PVP #2 facing south (8/19/09). Area dominated by native species along with scattered stands of reed canary grass.

Figure 7
Page 2 of 4

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 3. PVP #3 facing southeast (8/19/09). Edges of site contain stands of reed canary grass and some native species such as fowl manna grass, sneezeweed and New England aster.



Photograph 4. PVP #4 facing south (8/19/09). Wetland restoration zones (wet meadow, deep and shallow marsh) dominated by native species such as rice cut grass, broad-leaved arrowhead and sedge species.

Figure 7
Page 3 of 4

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 5. PVP #5 facing east (8/21/09). Areas along the ditch, especially on the south and east site boundaries are dominated by a band of giant ragweed.



Photograph 6. PVP #6 facing north (8/21/09). There is a small remaining stand of giant ragweed located around PVP #6 (the southwest end of Transect #3). The size of and quantity of plants in this area continues to decrease yearly.

PHOTOGRAPHIC LOG
Baumeister Wetland Mitigation Site
Racine County, Wisconsin



Photograph 7. PVP #7 facing northeast (8/21/09) . The transition between prairie planting and wet meadow.



Photograph 8. PVP #8 facing west (8/21/09). The deep and shallow marsh at this location (NW end of Transect #3) dominated by native species such as broad-leaved arrowhead, woolgrass, river bulrush, black bulrush and cattails.

EXHIBIT 1:
United States Army Corps of Engineers Correspondence

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

COPY

June 8, 2006

REPLY TO
Operations
Regulatory (2006-2807-DJP)

Ms. Barbara Eisenberg
T N & A Associates, Inc.
1033 N. Mayfair Road, Suite 200
Milwaukee, Wisconsin 53226

Dear Mr. Eisenberg:

This is in response to your May 24, 2006, letter requesting Corps concurrence with the compensatory mitigation proposed for the City of Burlington, STH 11 Bypass (WisDOT Project I.D. 3180-08-71). The compensatory mitigation site, also known as Baumeister Farm, is located in the NW ¼, Sec. 19, T. 2N., R. 19E., Racine County, Wisconsin.

We have reviewed the final plans and special provisions provided with your May 24, 2006, letter. The project is designed to retain 3.4 acres of existing wetlands, retain 3.91 acres of existing upland, restore 5.05 acres of upland to tall grass prairie, and to restore approximately 33.12 acres of wetlands within tiled crop land. The project would include the disablement of the existing sub-surface drain tile network and the planting and seeding of the wetland and upland prairie restoration areas. The project is expected to restore 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres or wet meadow, and 5.05 acres of tall grass upland prairie. The initial site preparation would be followed by 5-years of comprehensive monitoring and management to insure that the project's goals, objectives, and success criteria are met. The actual wetland credits available at the site are subject to the results of vegetative survey that would be conducted in the final phase of monitoring that would establish a more precise determination of the types of wetlands actually restored at the site

Based on the information provided, we concur that the "Baumeister Farm" wetland mitigation project would provide wetland restoration that would be adequate to provide compensation mitigation for the unavoidable wetland impacts associated with the Burlington Bypass project.

The decision regarding this action is based on information found in the administrative record, which documents the District's decision-making process, the basis for the decision, and the final decision.

RECEIVED
REGULATORY BRANCH
WAUKESHA

COPY

If you have any questions, contact Dale Pfeiffle in our Waukesha office at (262) 547-0868. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely

Robert J. Whiting
Chief, Regulatory Branch

Copy furnished:

Joanne Kline
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

Karla Leithoff
Wisconsin Department of Transportation
District 2
P.O. Box 798
Waukesha, Wisconsin 53187-0798

EXHIBIT 2:
Construction Plans
for the
Baumeister Wetland Mitigation Site

PROJECT ID: 3180-08-71

COUNTY: RACINE

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
3180-08-71		

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
Section No.	7	Sign Plates
Section No.	8	Structure Plans
Section No.	9	Computer Earthwork Data
Section No.	9	Cross Sections

TOTAL SHEETS =

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CITY OF BURLINGTON BYPASS

(WETLAND MITIGATION - BAUMEISTER FARM)

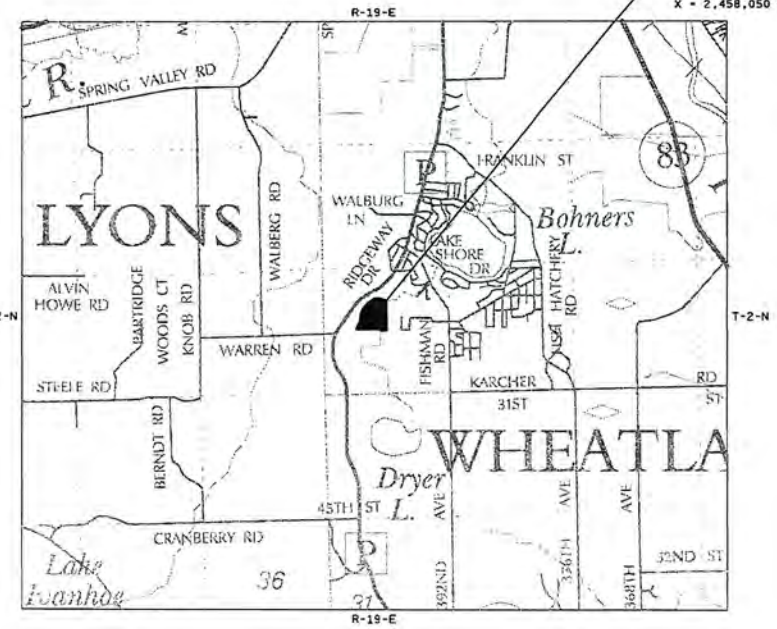
NON-HIGHWAY
RACINE COUNTY

STATE PROJECT NUMBER
3180-08-71





PROJECT LOCATION
Y = 230,700 +/-
X = 2,458,050 +/-



LAYOUT
SCALE 0 ½ MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

All coordinates on this plan are ground coordinates, (unless noted X, Y for grid) based on the Wisconsin State Plane Coordinate system (WSPCS) NAD 27 South Zone. To convert ground coordinates (N, E) to Grid Coordinates (Y, X), multiply ground coordinate by a combination factor of 0.99998531 and add 2,000,000 to the X coordinate.

Elevations shown on this plan are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

DESIGN DESIGNATION

A.D.T.	= N/A
A.D.T.	= N/A
D.H.V.	= N/A
D.D.	= N/A
T.	= N/A
DESIGN SPEED	= N/A
ESALS	= N/A

CONVENTIONAL SYMBOLS

PLAN
- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE
- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

UTILITIES
- ELECTRIC (E)
- FIBER OPTIC (FO)
- GAS (G)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

ORIGINAL PLANS PREPARED BY
TN & A TN & Associates, Inc.
Engineering and Science

WISCONSIN
JASON R. MATSON
37111
WAUKESHA, WI
PROFESSIONAL ENGINEER

1/30/2006 (Date) (Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	WISDOT
Designer	TN & ASSOCIATES
Project Manager	A. SMEJA
District Examiner	K. LEITHOFF
District Supervisor	D. SKORY
C.O. Examiner	

APPROVED FOR DISTRICT OFFICE
DATE 1/30/06 (Signature)

E

FILE NAME : p:\2005 projects\2005108 - baumeister\wlcrostation\planset\010101_ti.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

WISDOT/CADDS SHEET 10

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS, EXCEPT FOR PLANTING ZONES ARE TO BE SEEDED AND MULCHED IMMEDIATELY FOLLOWING COMPLETION OF WORK ACTIVITIES.

TEMPORARY STORAGE OF EQUIPMENT AND MATERIALS IN EXISTING WETLANDS IS NOT PERMITTED UNLESS AUTHORIZED BY THE ENGINEER.

ACCESS TO THE SITE IS PERMITTED ONLY AT THE SITE ACCESS POINTS SHOWN ON THE PLANS. EXACT LOCATION OF THE SITE ACCESS POINTS TO BE DETERMINED BY THE ENGINEER IN THE FIELD. THE SOUTHWESTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE TEMPORARY AND THE NORTHEASTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE PERMANENT.

UTILITIES EXIST ADJACENT TO THE PROJECT AND MAY BE AFFECTED BY THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIGGERS HOTLINE AND ANY UTILITIES IN THE AREA THAT ARE NOT A MEMBER OF DIGGERS HOTLINE.

ALL EROSION CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND ARE TO BE INSTALLED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.

OTHER AGENCIES

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FAX: (262) 763-2118
ASTREIF@TOWNOFBURLINGTON.COM

DISTRICT DNR AREA LIAISON

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TK6192@SBC.COM

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FAX: (262) 506-6711
AEBERHARDT@ATCLLC.COM

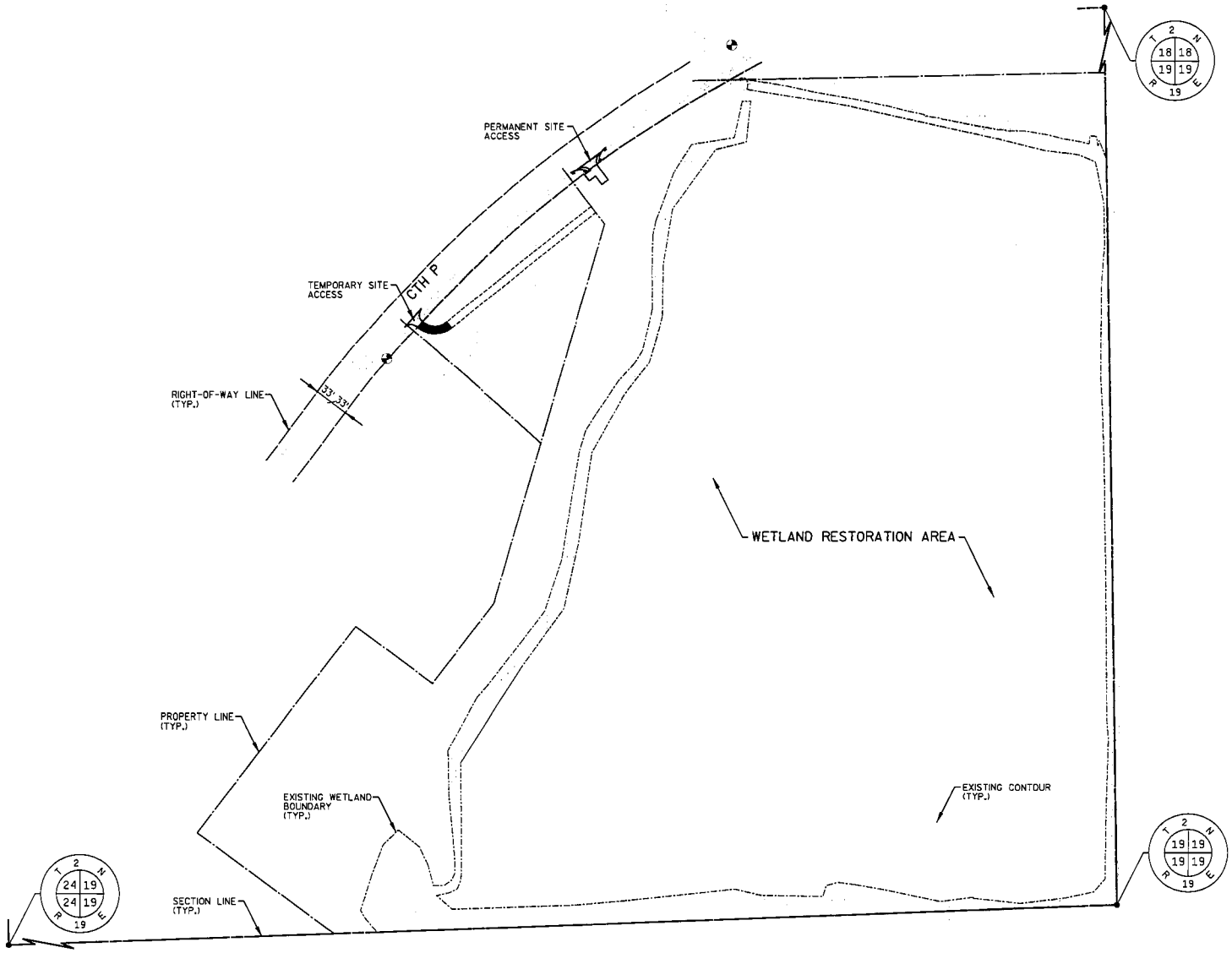
* MEMBER OF DIGGERS HOTLINE

STANDARD DETAIL DRAWINGS

8E9-6	SILT FENCE
14B15-4a	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-4b	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B18-4a	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
15D29-1	TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD

DIGGERS HOTLINE

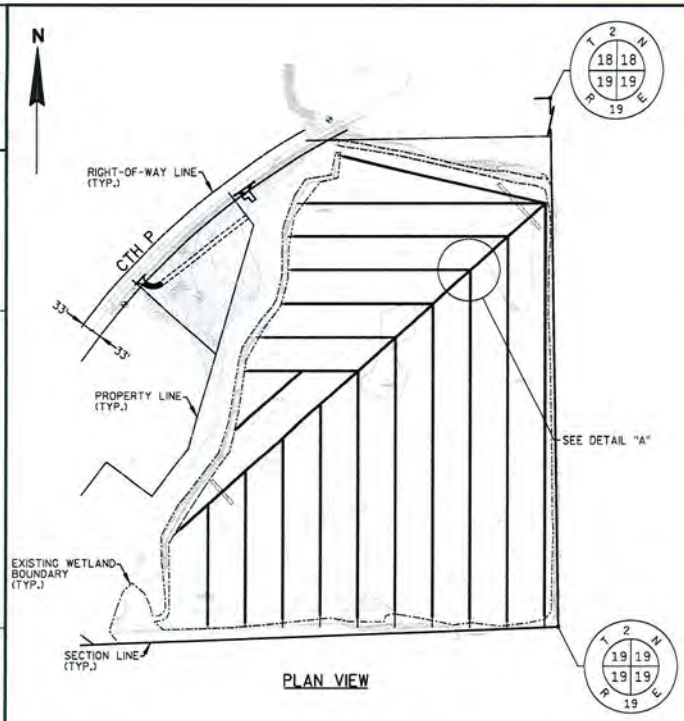
Toll Free (800) 242-8511
Milwaukee Area (414) 259-1181
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com



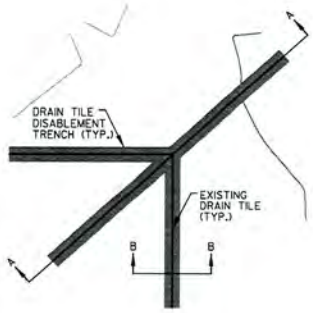
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PROJECT OVERVIEW	SCALE, FEET 0 100 200	SHEET E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\020201_po.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

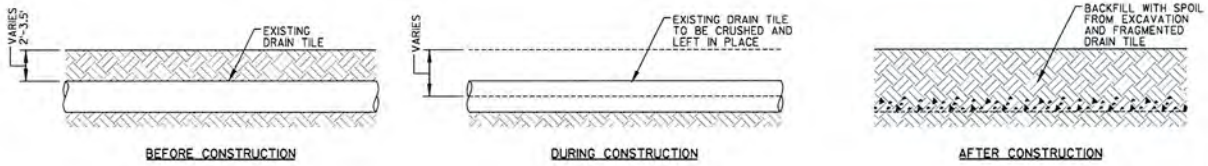
WISDOT/CADDS SHEET 42



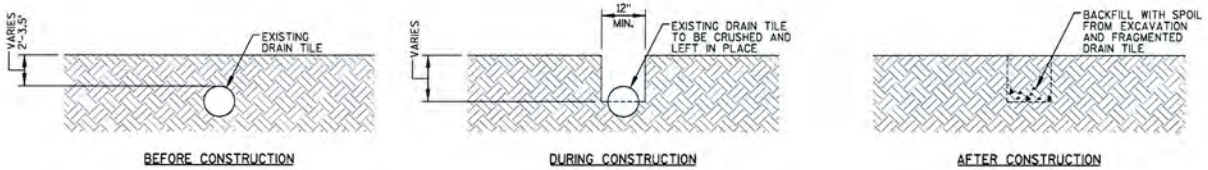
PLAN VIEW



DETAIL "A"



SECTION A-A



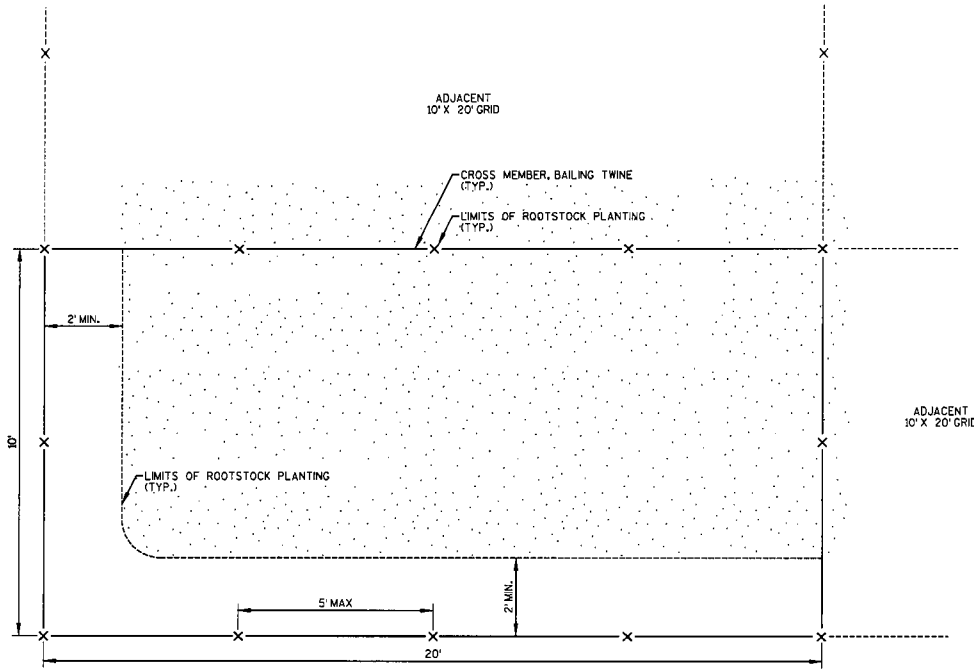
SECTION B-B

NOTES:

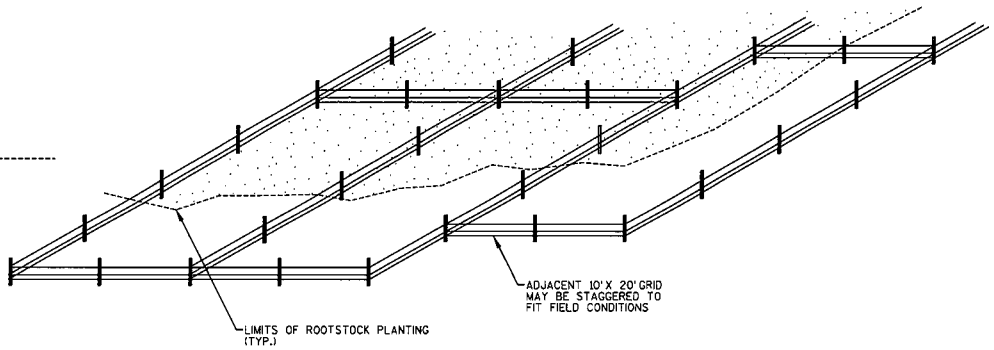
1. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
2. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
3. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
4. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
5. SEE DRAIN TILE DISABLEMENT PLAN SHEET FOR ADDITIONAL INFORMATION.

DRAIN TILE DISABLEMENT DETAIL
N.T.S.

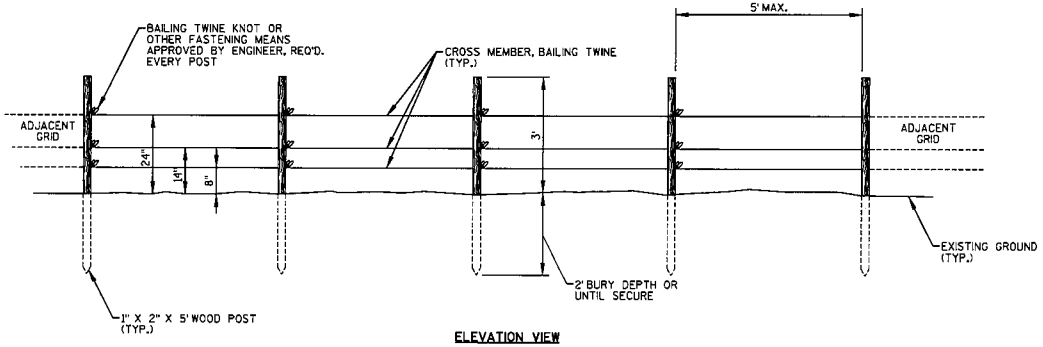
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



PLAN VIEW



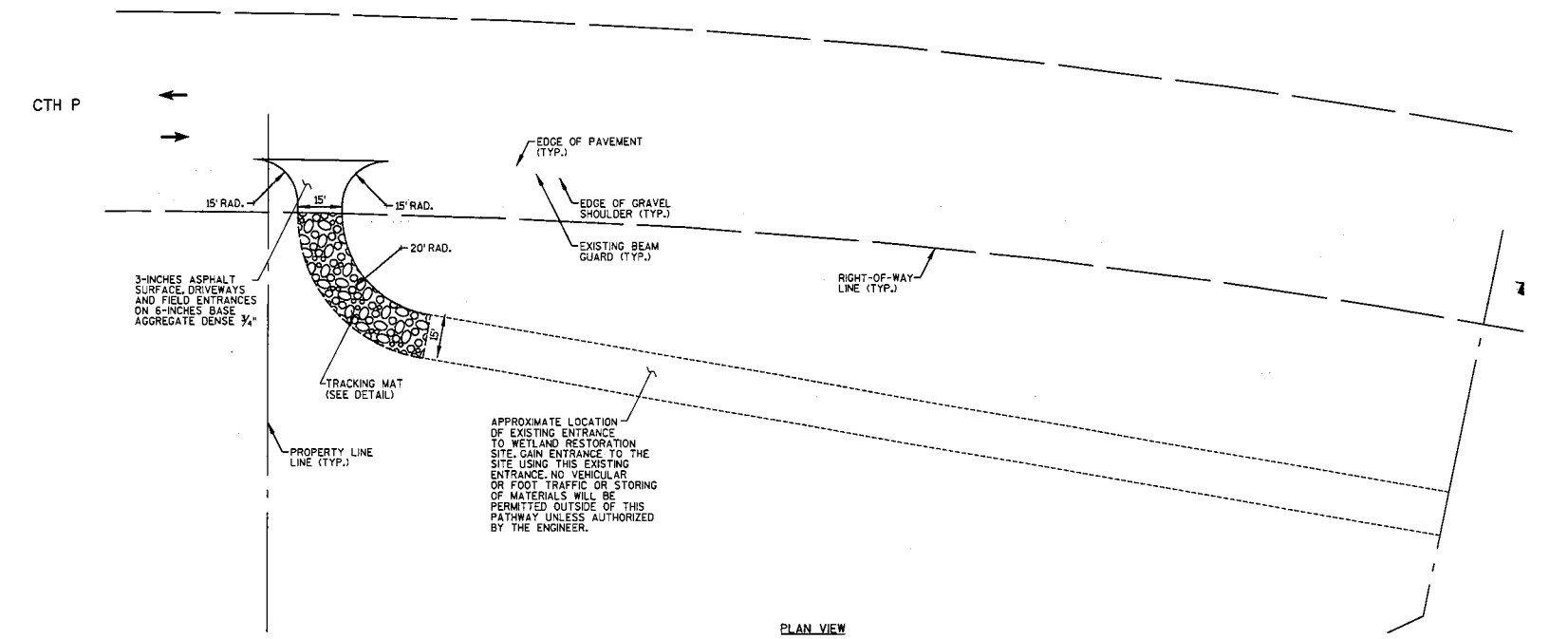
ISOMETRIC VIEW



ELEVATION VIEW

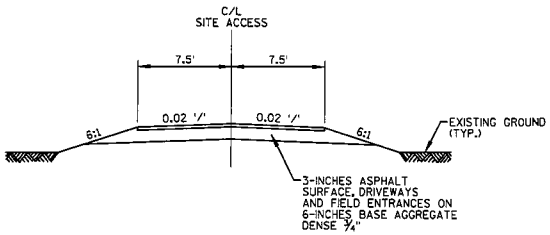
ROOTSTOCK PROTECTION DETAIL
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

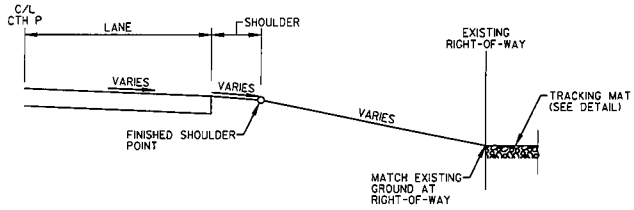


PLAN VIEW

NOTE: ALL TOPSOIL STRIPPED TO CONSTRUCT THE TEMPORARY SITE ACCESS POINT AND TRACKING PAD IS TO BE PLACED IN A NEAT PILE ON SITE WITH THE PROJECT MANAGER'S APPROVAL. THE PILE SHOULD BE NEAR THE ENTRANCE FOR THE TEMPORARY SITE ACCESS POINT AND WILL BE REMOVED BY OTHERS.



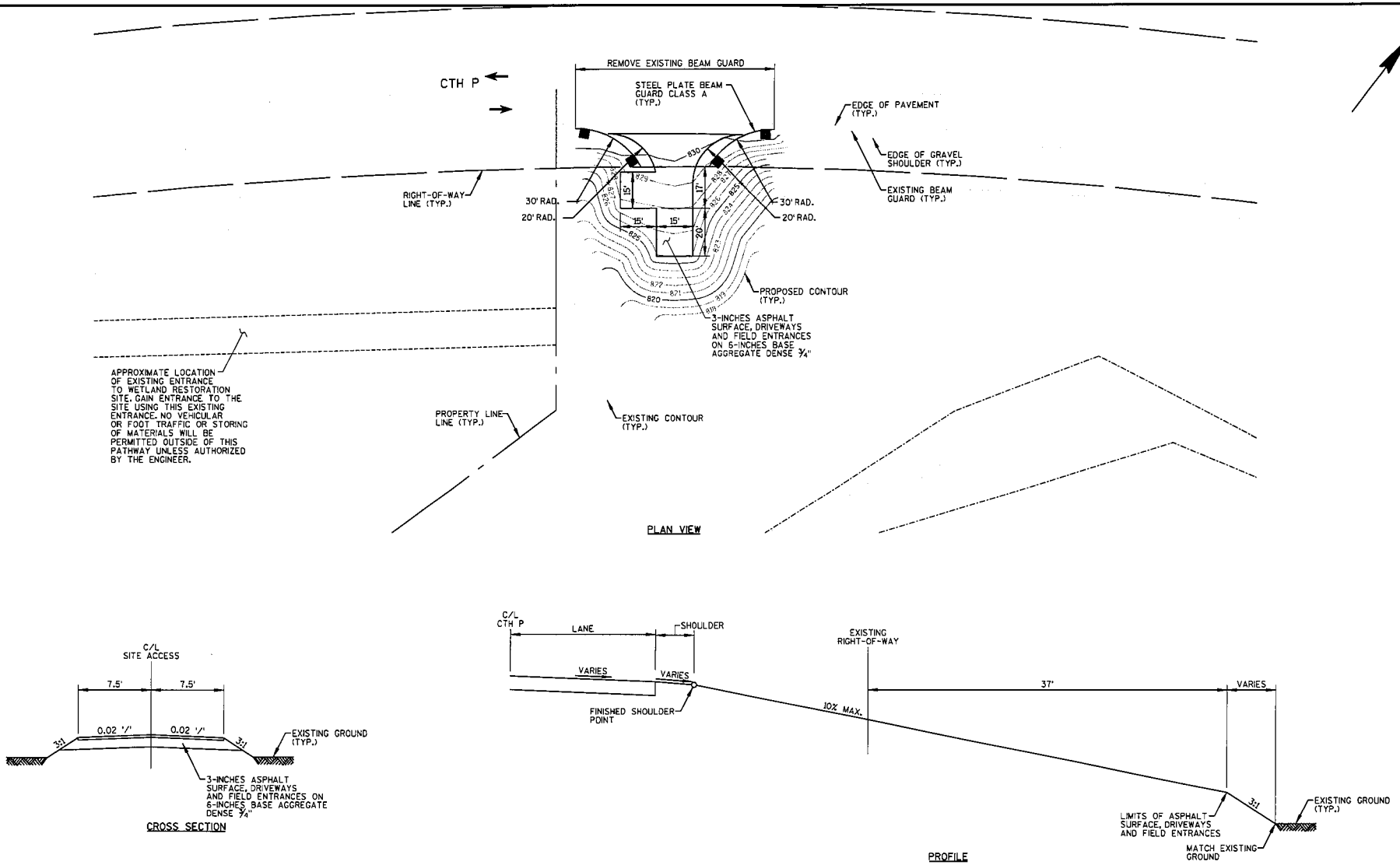
INSIDE RIGHT-OF-WAY CROSS SECTION



PROFILE

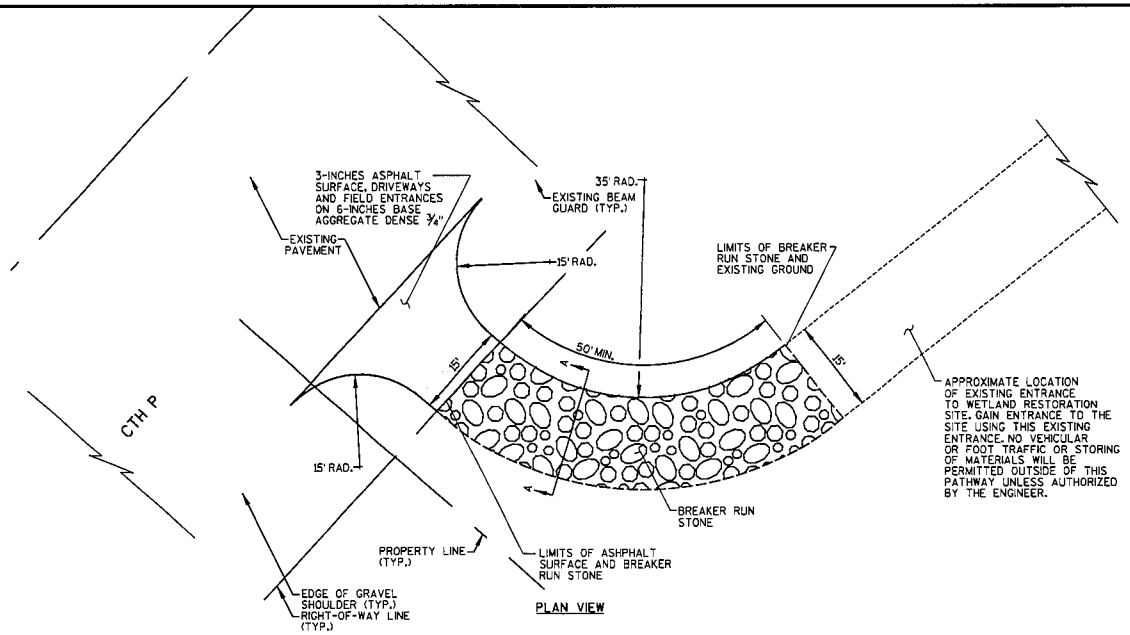
TEMPORARY SITE ACCESS POINT
CTH P
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

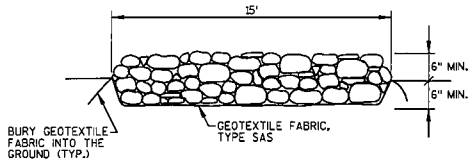


PERMANENT SITE ACCESS POINT
CTH P
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



PLAN VIEW



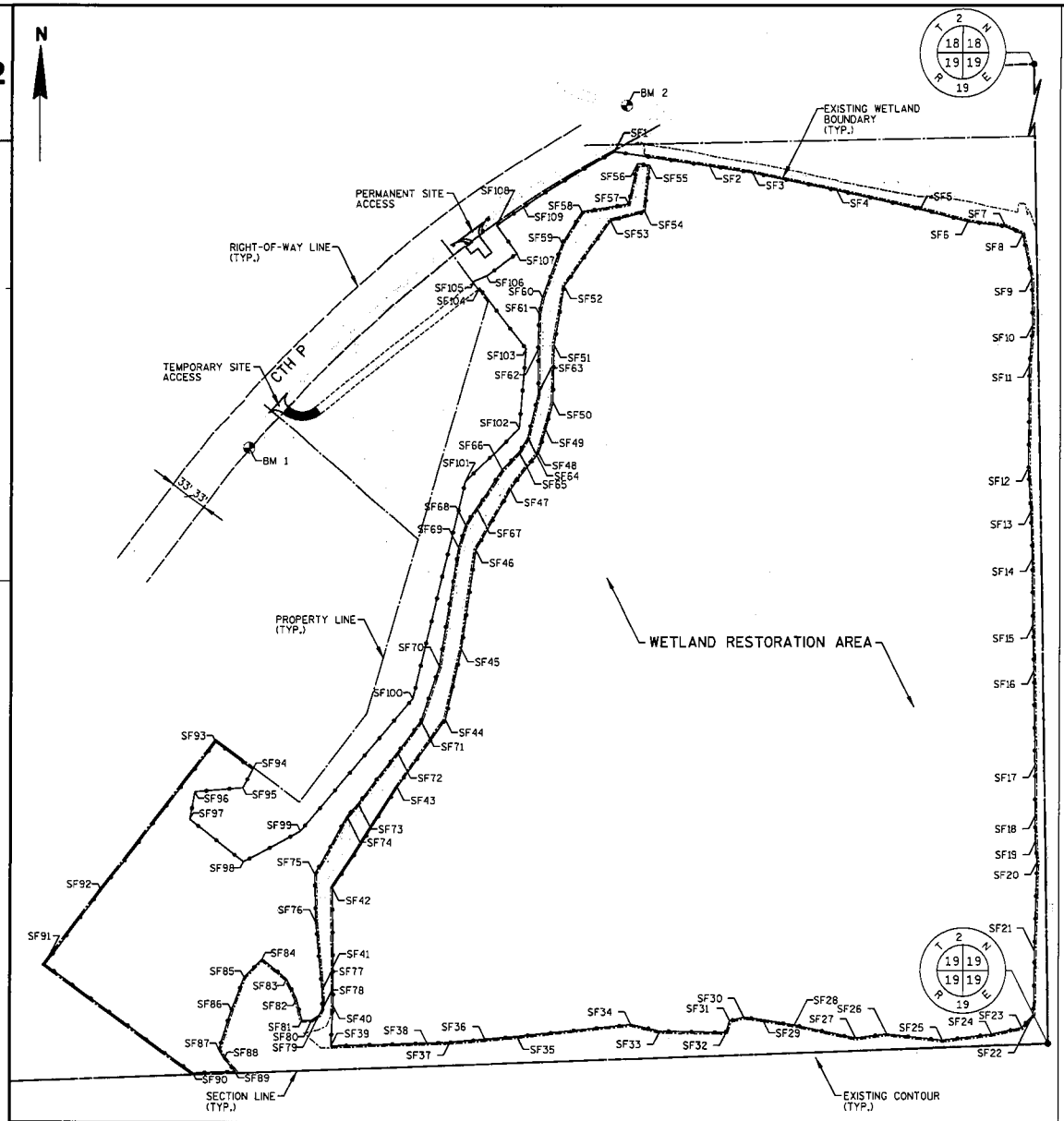
NOTE: TRACKING MATS SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

TRACKING MAT TO REMAIN IN PLACE AFTER CONSTRUCTION IS COMPLETED.

SECTION A-A

TRACKING MAT
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



EROSION CONTROL LEGEND

SILT FENCE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

SILT FENCE COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING
SF1	231,543.42	457,929.44
SF2	231,517.12	458,095.08
SF3	231,505.21	458,170.12
SF4	231,473.33	458,316.97
SF5	231,439.93	458,463.06
SF6	231,418.22	458,545.91
SF7	231,409.59	458,611.65
SF8	231,396.58	458,641.64
SF9	231,319.99	458,657.24
SF10	231,238.72	458,659.15
SF11	231,168.35	458,653.66
SF12	230,987.72	458,652.26
SF13	230,912.85	458,656.46
SF14	230,829.93	458,659.30
SF15	230,713.49	458,660.70
SF16	230,634.05	458,662.68
SF17	230,469.27	458,665.13
SF18	230,380.06	458,665.61
SF19	230,336.08	458,666.38
SF20	230,300.15	458,669.26
SF21	230,143.63	458,665.43
SF22	230,032.89	458,664.32
SF23	230,009.64	458,644.20
SF24	229,998.17	458,591.35
SF25	229,987.72	458,505.33
SF26	229,998.12	458,408.31
SF27	229,990.96	458,353.95
SF28	230,013.28	458,247.24
SF29	230,022.41	458,192.14
SF30	230,027.01	458,159.10
SF31	230,020.41	458,134.35
SF32	230,000.37	458,128.08
SF33	230,002.05	458,012.42
SF34	230,013.49	457,952.30
SF35	229,992.26	457,764.14
SF36	229,986.93	457,708.56
SF37	229,981.69	457,647.41
SF38	229,980.30	457,607.74
SF39	229,974.49	457,440.80
SF40	230,045.10	457,444.56
SF41	230,113.97	457,444.18
SF42	230,253.11	457,442.15
SF43	230,429.51	457,554.29
SF44	230,548.16	457,637.40
SF45	230,672.43	457,664.99
SF46	230,845.54	457,689.57
SF47	230,952.73	457,749.60
SF48	231,015.50	457,798.28
SF49	231,055.57	457,810.30
SF50	231,105.34	457,823.26
SF51	231,204.65	457,824.96
SF52	231,309.21	457,842.26
SF53	231,421.13	457,922.98
SF54	231,436.39	457,982.52
SF55	231,518.44	457,991.10
SF56	231,521.81	457,969.89
SF57	231,449.97	457,954.15
SF58	231,436.74	457,873.32

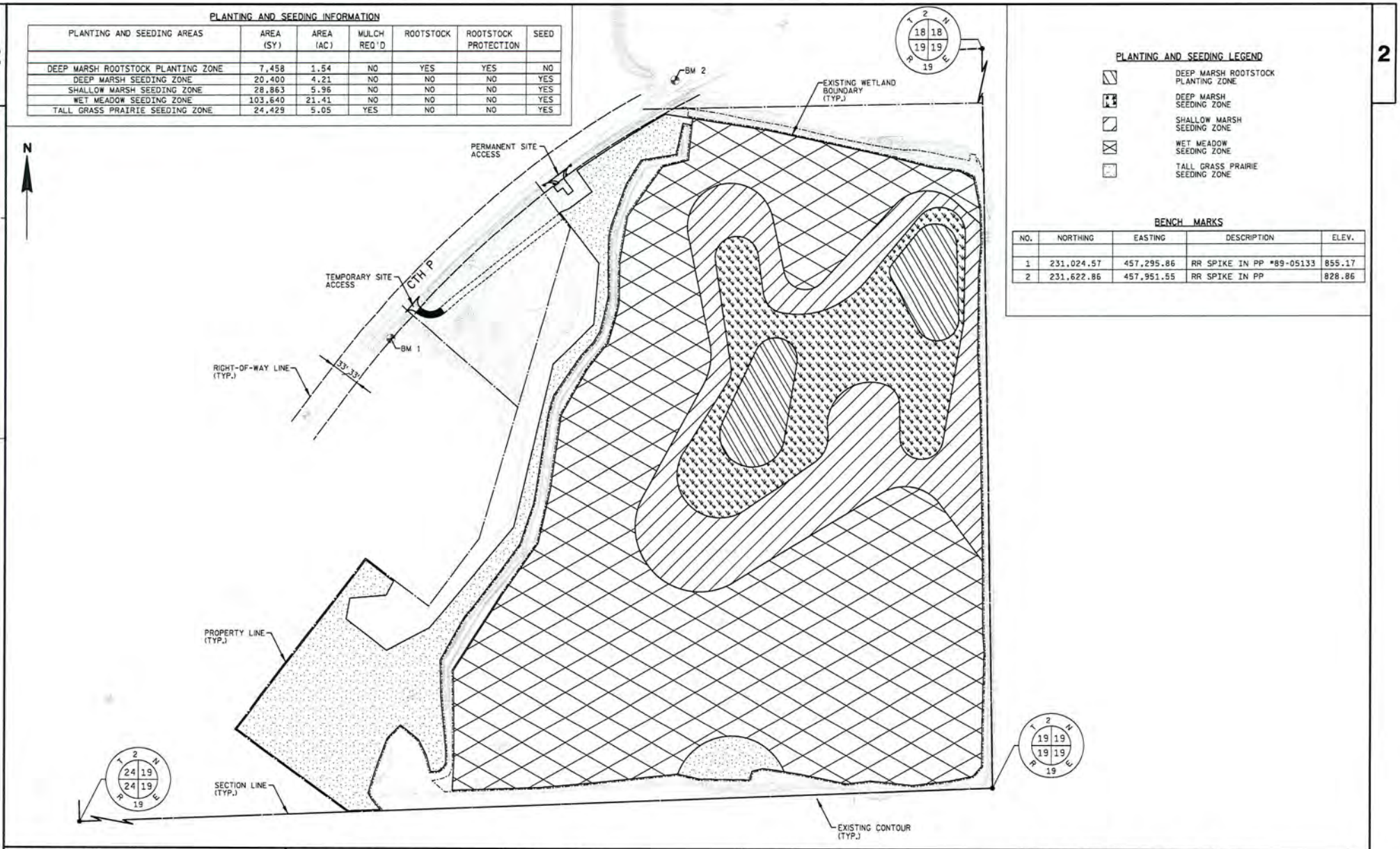
POINT NUMBER	NORTHING	EASTING
SF59	231,381.35	457,838.84
SF60	231,288.57	457,804.69
SF61	231,259.99	457,798.50
SF62	231,196.88	457,797.43
SF63	231,119.74	457,797.78
SF64	231,041.68	457,779.73
SF65	231,017.11	457,764.40
SF66	230,984.60	457,735.12
SF67	230,920.17	457,690.98
SF68	230,889.45	457,671.72
SF69	230,849.16	457,659.75
SF70	230,642.16	457,627.10
SF71	230,545.65	457,595.34
SF72	230,490.31	457,554.80
SF73	230,401.05	457,486.87
SF74	230,378.34	457,467.42
SF75	230,276.87	457,411.75
SF76	230,191.55	457,413.98
SF77	230,068.71	457,425.55
SF78	230,039.41	457,426.02
SF79	230,028.36	457,420.49
SF80	230,018.92	457,407.66
SF81	230,019.03	457,390.48
SF82	230,056.42	457,380.83
SF83	230,091.61	457,363.64
SF84	230,126.68	457,321.02
SF85	230,094.53	457,289.72
SF86	230,036.89	457,268.27
SF87	229,968.03	457,246.60
SF88	229,952.07	457,255.58
SF89	229,928.86	457,274.95
SF90	229,925.94	457,201.35
SF91	230,116.29	456,943.25
SF92	230,247.76	457,040.85
SF93	230,508.77	457,239.18
SF94	230,460.49	457,303.48
SF95	230,428.09	457,286.55
SF96	230,421.34	457,203.25
SF97	230,372.96	457,194.55
SF98	230,299.46	457,287.84
SF99	230,352.29	457,386.54
SF100	230,584.88	457,580.73
SF101	230,964.62	457,671.02
SF102	231,057.15	457,764.62
SF103	231,197.57	457,776.26
SF104	231,305.75	457,694.75
SF105	231,317.74	457,685.71
SF106	231,326.80	457,707.45
SF107	231,364.19	457,759.93
SF108	231,413.31	457,724.94
SF109	231,445.42	457,771.19

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	EROSION CONTROL	SCALE, FEET 0 100 200	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\022001_ec.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

PLANTING AND SEEDING INFORMATION

PLANTING AND SEEDING AREAS	AREA (SY)	AREA (AC)	MULCH REQ'D	ROOTSTOCK	ROOTSTOCK PROTECTION	SEED
DEEP MARSH ROOTSTOCK PLANTING ZONE	7,458	1.54	NO	YES	YES	NO
DEEP MARSH SEEDING ZONE	20,400	4.21	NO	NO	NO	YES
SHALLOW MARSH SEEDING ZONE	28,863	5.96	NO	NO	NO	YES
WET MEADOW SEEDING ZONE	103,640	21.41	NO	NO	NO	YES
TALL GRASS PRAIRIE SEEDING ZONE	24,429	5.05	YES	NO	NO	YES



PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP *89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

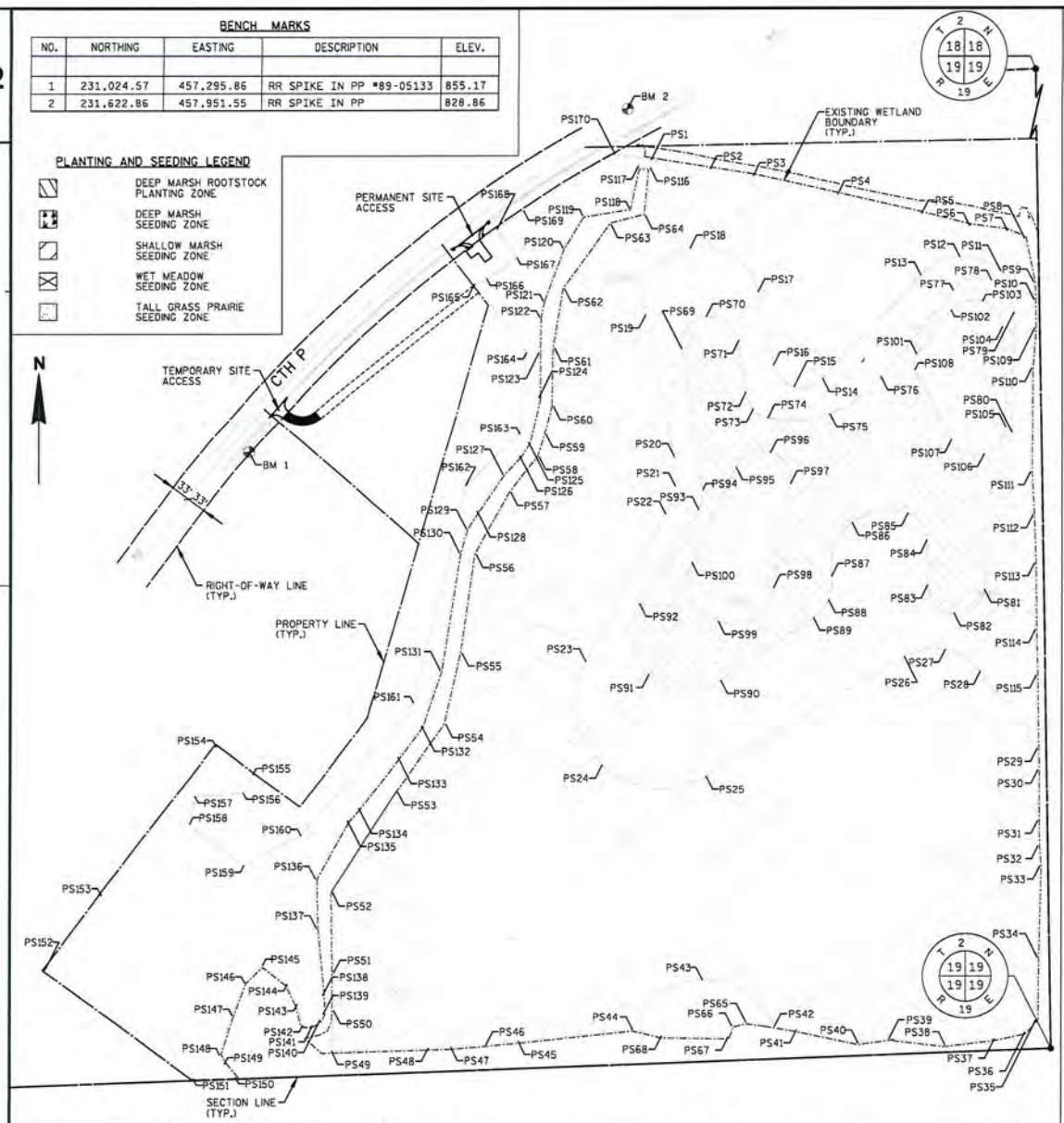
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BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP *89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE



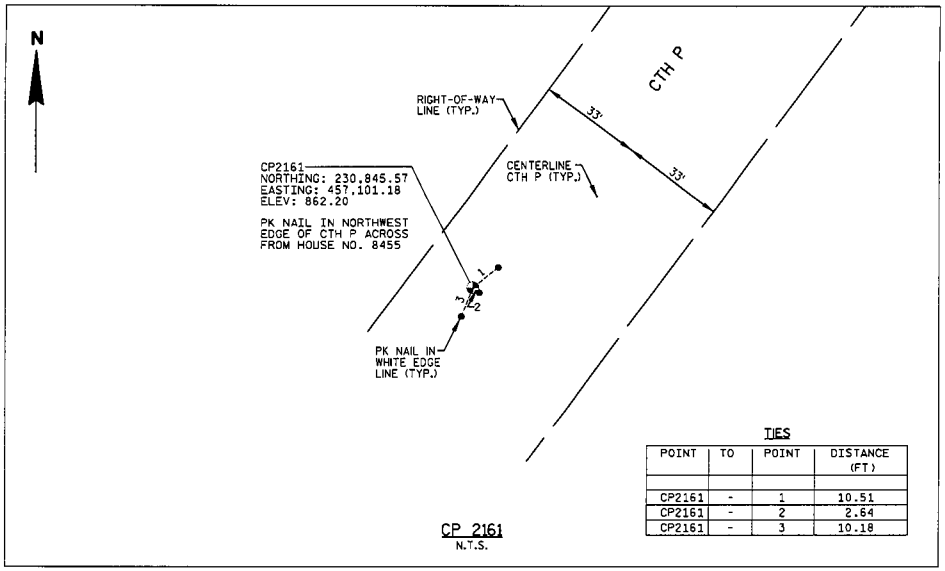
PLANTING AND SEEDING COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING	POINT NUMBER	NORTHING	EASTING
PS1	231,533.38	457,992.66	PS86	230,899.66	458,342.10
PS2	231,517.12	458,095.08	PS87	230,807.67	458,306.66
PS3	231,505.21	458,170.12	PS88	230,766.85	458,301.31
PS4	231,473.33	458,316.97	PS89	230,735.00	458,275.22
PS5	231,439.93	458,463.06	PS90	230,624.51	458,114.67
PS6	231,418.22	458,545.91	PS91	230,634.59	457,988.90
PS7	231,409.59	458,611.65	PS92	230,759.77	457,973.11
PS8	231,396.58	458,641.64	PS93	230,923.00	458,075.36
PS9	231,319.99	458,657.24	PS94	230,956.95	458,082.44
PS10	231,289.40	458,657.96	PS95	230,997.03	458,140.36
PS11	231,340.06	458,599.81	PS96	231,023.77	458,200.39
PS12	231,364.64	458,528.92	PS97	230,967.94	458,235.06
PS13	231,333.00	458,460.89	PS98	230,787.99	458,205.89
PS14	231,151.42	458,290.85	PS99	230,728.40	458,109.87
PS15	231,137.46	458,240.81	PS100	230,831.60	458,063.81
PS16	231,175.46	458,205.39	PS101	231,193.95	458,453.74
PS17	231,303.66	458,178.31	PS102	231,270.54	458,514.14
PS18	231,380.89	458,060.08	PS103	231,287.06	458,569.10
PS19	231,262.89	457,982.51	PS104	231,241.02	458,603.38
PS20	231,016.60	458,032.72	PS105	231,069.80	458,608.77
PS21	230,964.60	458,034.18	PS106	231,019.97	458,571.36
PS22	230,915.22	458,017.79	PS107	231,045.30	458,514.43
PS23	230,657.99	457,879.45	PS108	231,167.05	458,451.13
PS24	230,478.01	457,908.13	PS109	231,238.72	458,659.15
PS25	230,458.56	458,089.34	PS110	231,168.35	458,653.66
PS26	230,666.25	458,433.20	PS111	230,987.72	458,652.26
PS27	230,678.78	458,504.15	PS112	230,912.85	458,656.46
PS28	230,640.37	458,565.11	PS113	230,829.93	458,659.30
PS29	230,506.77	458,664.57	PS114	230,713.49	458,660.70
PS30	230,469.27	458,665.13	PS115	230,634.05	458,662.68
PS31	230,380.06	458,665.61	PS116	231,518.44	457,991.10
PS32	230,336.08	458,666.38	PS117	231,521.81	457,969.89
PS33	230,300.15	458,669.26	PS118	231,449.97	457,954.15
PS34	230,143.63	458,665.43	PS119	231,436.74	457,873.32
PS35	230,032.89	458,664.32	PS120	231,381.35	457,838.84
PS36	230,009.64	458,644.20	PS121	231,288.57	457,804.69
PS37	229,998.17	458,591.35	PS122	231,259.99	457,798.50
PS38	229,987.72	458,505.33	PS123	231,196.88	457,797.43
PS39	229,998.12	458,408.31	PS124	231,119.74	457,797.78
PS40	229,990.96	458,353.95	PS125	231,041.68	457,779.73
PS41	230,013.28	458,247.24	PS126	231,017.11	457,764.40
PS42	230,019.63	458,208.90	PS127	230,984.60	457,735.12
PS43	230,102.06	458,083.47	PS128	230,920.17	457,690.98
PS44	230,013.49	457,962.30	PS129	230,889.45	457,671.72
PS45	229,992.26	457,764.14	PS130	230,849.16	457,659.75
PS46	229,986.93	457,708.56	PS131	230,642.16	457,627.10
PS47	229,981.69	457,647.41	PS132	230,545.65	457,595.34
PS48	229,980.30	457,607.74	PS133	230,490.31	457,554.80
PS49	229,974.49	457,440.80	PS134	230,401.05	457,486.87
PS50	230,045.10	457,444.56	PS135	230,378.34	457,467.42
PS51	230,113.97	457,444.18	PS136	230,276.87	457,411.75
PS52	230,253.11	457,442.15	PS137	230,191.55	457,413.98
PS53	230,429.51	457,554.29	PS138	230,068.71	457,425.55
PS54	230,548.16	457,637.40	PS139	230,039.41	457,426.02
PS55	230,672.43	457,664.99	PS140	230,028.36	457,420.49
PS56	230,845.54	457,689.57	PS141	230,018.91	457,407.66
PS57	230,952.73	457,749.60	PS142	230,019.03	457,390.48
PS58	231,015.50	457,798.28	PS143	230,056.42	457,380.83
PS59	231,055.57	457,810.30	PS144	230,091.61	457,363.64
PS60	231,105.34	457,823.26	PS145	230,126.68	457,321.02
PS61	231,204.65	457,824.96	PS146	230,094.53	457,289.72
PS62	231,309.21	457,842.26	PS147	230,036.89	457,268.27
PS63	231,421.13	457,922.98	PS148	229,968.03	457,246.60
PS64	231,436.39	457,982.52	PS149	229,952.07	457,255.58
PS65	230,027.01	458,159.10	PS150	229,928.86	457,274.95
PS66	230,020.41	458,134.35	PS151	229,925.94	457,201.35
PS67	230,000.37	458,128.08	PS152	230,116.29	456,943.25
PS68	230,002.05	458,012.42	PS153	230,247.76	457,040.85
PS69	231,203.36	458,045.55	PS154	230,508.77	457,239.18
PS70	231,260.26	458,087.95	PS155	230,460.49	457,303.48
PS71	231,217.46	458,144.55	PS156	230,428.09	457,286.55
PS72	231,127.99	458,156.65	PS157	230,421.34	457,203.25
PS73	231,100.76	458,169.48	PS158	230,372.96	457,194.55
PS74	231,085.82	458,195.62	PS159	230,299.46	457,287.84
PS75	231,092.38	458,303.61	PS160	230,352.29	457,386.54
PS76	231,154.21	458,392.39	PS161	230,584.88	457,580.73
PS77	231,305.77	458,517.10	PS162	230,964.62	457,671.02
PS78	231,323.78	458,584.10	PS163	231,057.15	457,764.62
PS79	231,266.53	458,623.30	PS164	231,197.57	457,776.26
PS80	231,059.59	458,619.94	PS165	231,317.74	457,685.71
PS81	230,784.46	458,572.68	PS166	231,326.80	457,707.45
PS82	230,742.87	458,519.50	PS167	231,364.19	457,759.93
PS83	230,792.16	458,473.37	PS168	231,413.31	457,724.94
PS84	230,869.93	458,472.39	PS169	231,445.42	457,771.19
PS85	230,916.56	458,439.22	PS170	231,543.42	457,929.44

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\023102_pl.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

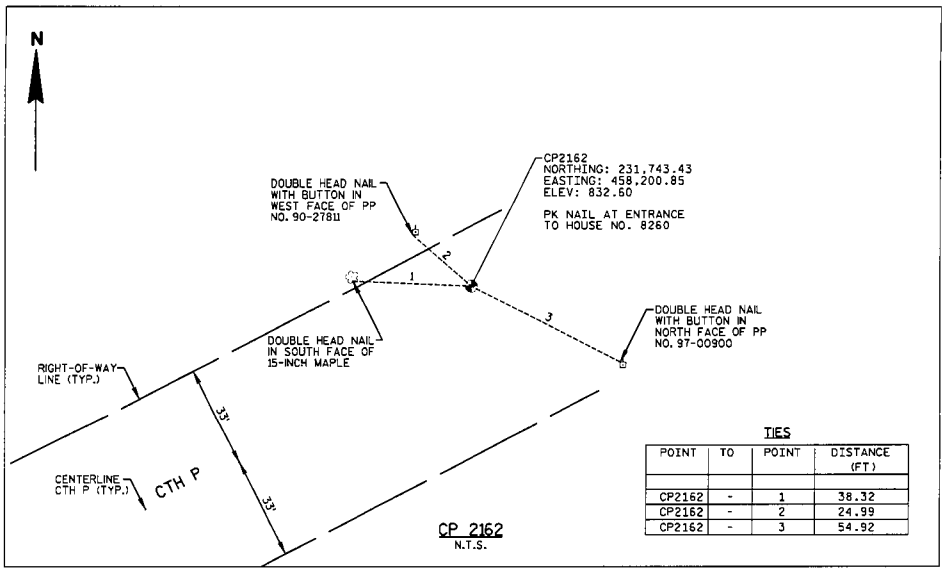
WISDOT/CADDS SHEET 42



TIES

POINT	TO	POINT	DISTANCE (FT)
CP2161	-	1	10.51
CP2161	-	2	2.64
CP2161	-	3	10.18

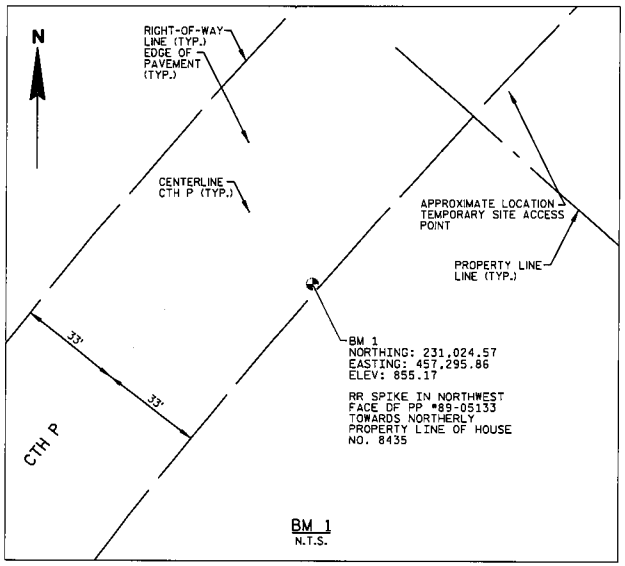
CP 2161
N.T.S.



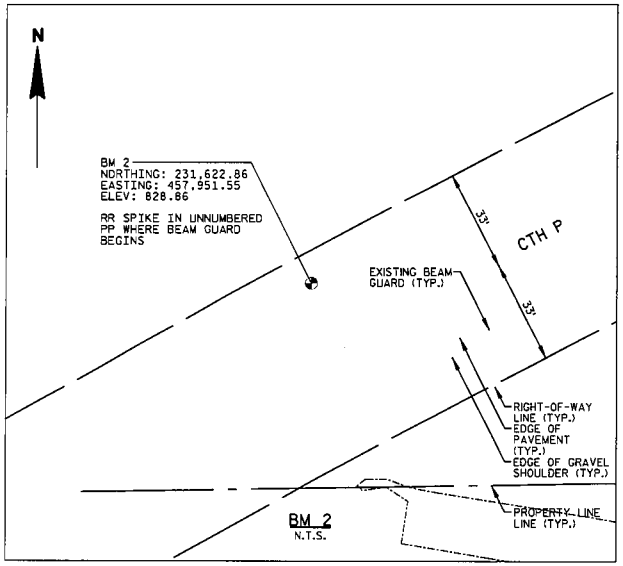
TIES

POINT	TO	POINT	DISTANCE (FT)
CP2162	-	1	38.32
CP2162	-	2	24.99
CP2162	-	3	54.92

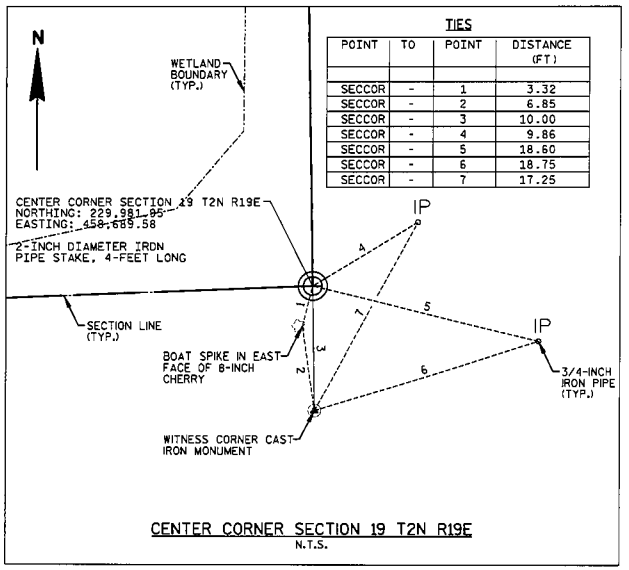
CP 2162
N.T.S.



BM 1
N.T.S.



BM 2
N.T.S.

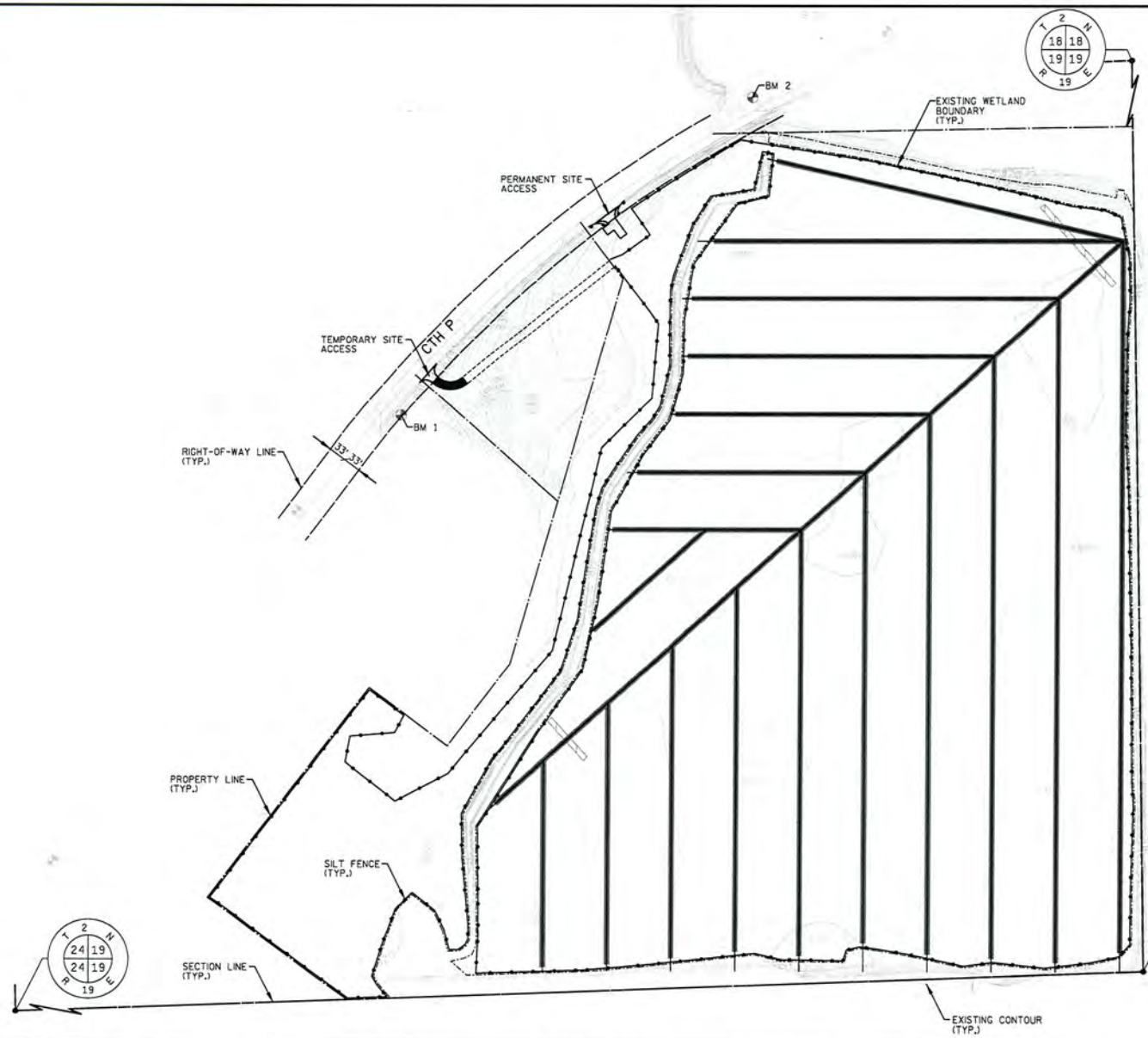


TIES

POINT	TO	POINT	DISTANCE (FT)
SECCOR	-	1	3.32
SECCOR	-	2	6.85
SECCOR	-	3	10.00
SECCOR	-	4	9.86
SECCOR	-	5	18.60
SECCOR	-	6	18.75
SECCOR	-	7	17.25

CENTER CORNER SECTION 19 T2N R19E
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	ALIGNMENT TIES	SHEET	E



DRAIN TILE DISABLEMENT LEGEND

- DRAIN TILE (APPROXIMATE LOCATION)
- DRAIN TILE DISABLEMENT
- DRAIN TILE EXPLORATION

SUGGESTED DRAIN TILE DISABLEMENT SEQUENCE OF EVENTS

1. USE DRAIN TILE EXPLORATION TO EXPOSE THE DRAIN TILE MAIN LINE.
2. DISABLE DRAIN TILE MAIN LINE MAKING SURE TO LOCATE ALL CONNECTING DRAIN TILE LINES.
3. DISABLE ALL OTHER DRAIN TILE LINES LOCATED DURING DISABLEMENT OF DRAIN TILE MAIN LINE.

NOTES:

1. THE ENTIRE DRAIN TILE SYSTEM IS TO BE DISABLED.
2. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
3. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
4. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
5. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
6. SEE DRAIN TILE DISABLEMENT CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	DRAIN TILE DISABLEMENT	SCALE, FEET 0 100 200	SHEET	E

FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\027301_dp.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_

WISDOT/CADDS SHEET 42

REMOVING GUARDRAIL

LOCATION	204.0165 LF
PERMANENT SITE ACCESS POINT	82

TOTAL 82

EXCAVATION COMMON

LOCATION	205.0100 CY
TRACKING MAT	16.85

TOTAL 16.85

BASE AGGREGATE

LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON
TEMPORARY SITE ACCESS POINT	13.69
PERMANENT SITE ACCESS POINT	43.00

TOTAL 56.69

BREAKER RUN

LOCATION	311.0110 TON
TRACKING MAT	58.97

TOTAL 58.97

ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES

LOCATION	465.0120 TON
TEMPORARY SITE ACCESS POINT	6.78
PERMANENT SITE ACCESS POINT	21.28

TOTAL 28.06

DRAIN TILE EXPLORATION

LOCATION	612.0700 (LF)
SOUTHWEST PORTION WETLAND RESTORATION AREA	100
NORTHEAST PORTION WETLAND RESTORATION AREA	200

TOTAL 300

STEEL PLATE BEAM GUARD CLASS A

LOCATION	614.0305 (LF)
PERMANENT SITE ACCESS POINT	53

TOTAL 53

3

3

MULCHING, SEEDING MIXTURE NO. 70, SEED BED PREPARATION, SEEDING, ROOTSTOCK PROTECTION, ROOTSTOCK, SEED MIX

LOCATION	627.0200* MULCHING SY	630.0170* SEEDING MIXTURE NO. 70 LB	630.0400* SEEDING NURSE CROP LB	SPV.0005.01 SEED BED PREPARATION ACRE	SPV.0005.02 SEEDING ACRE	SPV.0005.03 ROOTSTOCK PROTECTION ACRE	SPV.0060.01 ROOTSTOCK EACH	SPV.0085.01 SEED MIX LB
DEEP MARSH ROOTSTOCK PLANTING ZONE	24429			1.54		1.54	2685	
DEEP MARSH SEEDING ZONE				4.21	4.21			50.52
SHALLOW MARSH SEEDING ZONE				5.96	5.96			71.52
WET MEADOW SEEDING ZONE				21.41	21.41			256.92
TALL GRASS PRAIRIE SEEDING ZONE				5.05	5.05			60.60
TEMPORARY SITE ACCESS POINT	685	2.46	4.93					
UNDISTRIBUTED	68	0.25	0.49					
TOTALS	25182	2.71	5.42	38.17	36.63	1.54	2685	439.56

* NOTE: ADDITIONAL QUANTITIES OF THESE ITEMS ARE ALSO REQUIRED FOR ITEM NUMBER SPV.0105.02 GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF1	SF2	168	17
SF2	SF3	76	8
SF3	SF4	150	15
SF4	SF5	150	15
SF5	SF6	86	9
SF6	SF7	66	7
SF7	SF8	33	3
SF8	SF9	78	8
SF9	SF10	81	8
SF10	SF11	71	7
SF11	SF12	181	18
SF12	SF13	75	8
SF13	SF14	83	8
SF14	SF15	116	12
SF15	SF16	79	8
SF16	SF17	165	17
SF17	SF18	89	9
SF18	SF19	44	4
SF19	SF20	36	4
SF20	SF21	157	16
SF21	SF22	111	11
SF22	SF23	31	3
SF23	SF24	54	5
SF24	SF25	87	9
SF25	SF26	98	10
SF26	SF27	55	6
SF27	SF28	109	11
SF28	SF29	56	6
SF29	SF30	33	3
SF30	SF31	26	3
SF31	SF32	21	2
SF32	SF33	116	12
SF33	SF34	51	5
SF34	SF35	199	20
SF35	SF36	56	6

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF36	SF37	61	6
SF37	SF38	40	4
SF38	SF39	167	17
SF39	SF40	71	7
SF40	SF41	69	7
SF41	SF42	139	14
SF42	SF43	211	21
SF43	SF44	145	15
SF44	SF45	127	13
SF45	SF46	175	18
SF46	SF47	123	12
SF47	SF48	79	8
SF48	SF49	42	4
SF49	SF50	51	5
SF50	SF51	99	10
SF51	SF52	106	11
SF52	SF53	138	14
SF53	SF54	61	6
SF54	SF55	83	8
SF55	SF56	21	2
SF56	SF57	74	7
SF57	SF58	82	8
SF58	SF59	65	7
SF59	SF60	99	10
SF60	SF61	29	3
SF61	SF62	63	6
SF62	SF63	77	8
SF63	SF64	80	8
SF64	SF65	29	3
SF65	SF66	44	4
SF66	SF67	78	8
SF67	SF68	36	4
SF68	SF69	42	4
SF69	SF70	210	21
SF70	SF71	102	10
SF71	SF72	69	7
SF72	SF73	112	11

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF73	SF74	30	3
SF74	SF75	116	12
SF75	SF76	85	9
SF76	SF77	123	12
SF77	SF78	29	3
SF78	SF79	12	1
SF79	SF80	16	2
SF80	SF81	17	2
SF81	SF82	39	4
SF82	SF83	39	4
SF83	SF84	55	6
SF84	SF85	45	5
SF85	SF86	62	6
SF86	SF87	72	7
SF87	SF88	18	2
SF88	SF89	30	3
SF89	SF90	74	7
SF90	SF91	321	32
SF91	SF92	164	16
SF92	SF93	328	33
SF93	SF94	80	8
SF94	SF95	37	4
SF95	SF96	84	8
SF96	SF97	49	5
SF97	SF98	119	12
SF98	SF99	112	11
SF99	SF100	303	30
SF100	SF101	390	39
SF101	SF102	132	13
SF102	SF103	141	14
SF103	SF104	135	14
SF105	SF106	24	2
SF106	SF107	64	6
SF107	SF108	60	6
SF108	SF109	56	6
SF109	SF1	186	19
UNDISTRIBUTED (25%)		2508	251
	TOTALS	12541	1261

EROSION CONTROL MOBILIZATIONS

LOCATION	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
PROJECT 3180-08-71	2	2
TOTALS	2	2

TRAFFIC CONTROL

LOCATION	ITEM 643.0420 TRAFFIC CONTROL BARRICADES TYPE III DAYS	ITEM 643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A DAYS	ITEM 643.0900 TRAFFIC CONTROL SIGNS DAYS
CTH P	288	288	576
TOTALS	288	288	576

* NOTE: SEE SDD 15D29-1 TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD FOR PLACEMENT

GEOTEXTILE FABRIC TYPE SAS

LOCATION	645.0140 SY
TRACKING MAT	116.46
TOTAL	116.46

DRAIN TILE DISABLEMENT

LOCATION	SPV.0090.01 LF
WETLAND RESTORATION AREA	13600
TOTAL	13600

CONSTRUCTION STAKING SEEDING AND PLANTING ZONES

LOCATION	SPV.0105.01 LS
WETLAND RESTORATION AREA	1
TOTAL	1

GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

LOCATION	SPV.0105.02 LS
PERMANENT SITE ACCESS POINT	1
TOTAL	1

APPROXIMATE BID ITEM QUANTITIES REQUIRED FOR SPV.0105.02		
ITEM NO.	ITEM DESCRIPTION	QUANTITY
208.0100*	BORROW	570 CY
625.0500*	SALVAGED TOPSOIL	490 SY
627.0200*	MULCHING	490 SY
630.0170*	SEEDING MIXTURE NO. 70	1.73 LB
630.0400*	SEEDING NURSE CROP	3.47 LB

* NOTE: THESE QUANTITIES ARE NOT INCLUDED ELSEWHERE IN THE PLANS OR ESTIMATE

R/W PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
3180-08-21		
FEDERAL PROJECT NUMBER	4.0	

PLAT OF RIGHT OF WAY REQUIRED FOR

STH 11 - BURLINGTON BYPASS
WETLAND MITIGATION SITE

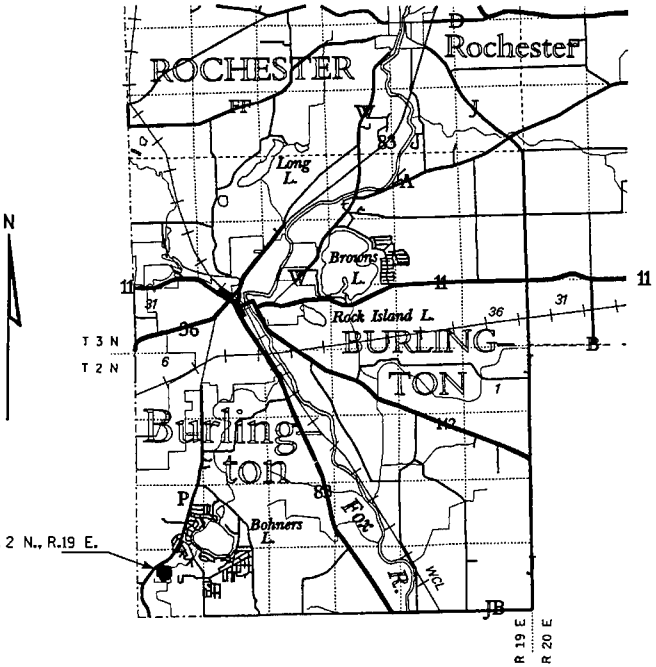
STH 11 — RACINE CO.

CONSTRUCTION NO. 3180-08-71

CONVENTIONAL SIGNS AND ABBREVIATIONS

ACCESS POINT	A.P.
ACCESS RIGHTS	A.R..
ACRES	AC.
AHEAD	AH.
AND OTHERS	ET. AL.
BACK	BK.
BARN	B
CENTERLINE	℄
CENTRAL ANGLE OR DELTA	Δ
CONSTRUCTION PERMIT	C.P.
CONVEYANCE	CONV.
CORNER	COR.
DEED	(D)
DIST. BETWEEN ¼ CORNERS	(DIST.)
DOCUMENT	DOC.
ESTATE	EST.
EXCLUDING	EXCL.
FRONTAGE ROAD	FR. RD.
GARAGE	G
HOUSE	H
LAND CONTRACT	L.C.
LENGTH OF CURVE	L
LONG CHORD	L. CH.
MONUMENT	MON.
OUTLOT	O.L.
PERMANENT	PERM.
PROPERTY LINE	P.L.
QUIT CLAIM DEED	Q.C.D.
RADIUS	R
REFERENCE LINE	℟
RELOCATED	RELOC.
REMAINING	REM.
RIGHT OF WAY	R/W
SECTION	SEC.
SEVERED	SEV.
STATION	STA.
TANGENT	TAN.
TEMPORARY	TEMP.
TEMPORARY INTEREST	TI
TRANSIT LINE	
BRIDGE	
BUILDING	Label
CATTLE PASS	
IRON PIPE	I.P.
POWER POLE	
TELEPHONE POLE	
TELEPHONE PEDESTAL	T.P.
R/W MONUMENT	
R/W STANDARD	
GAS PUMP ISLAND	G.P.

STATE LINE	
COUNTY LINE	
TOWN AND RANGE LINE	
SECTION LINE	
QUARTER LINE	
SIXTEENTH LINE	
NEW CENTERLINE	
OLD CENTERLINE	
PROPOSED OR NEW R/W LINE	
EXISTING R/W LINE	
PROPERTY LINE	
LOT, TIE AND OTHER MINOR DASHED LINES	
SLOPE INTERCEPTS	
CORPORATE LIMITS	
WATER	W
GAS	G
TELEPHONE OR TELEGRAPH	T
ELECTRIC	E
CABLE TELEVISION	TV
FIBER OPTIC	FO
SANITARY SEWER	SAN
STORM SEWER	SS
NO ACCESS (By Previous Acquisition)	
NO ACCESS (By Acquisition)	
NO ACCESS (By Statutory Authority)	
LIMITED EASEMENT (Temporary or Permanent)	
WELL	WELL
SEPTIC PUMP	S.P.
SEPTIC TANK	S.T.
SEPTIC VENT	S.V.
SIGN	SIGN



SITE LOCATION IN THE NW 1/4 OF SEC. 19, T. 2 N., R.19 E.

LAYOUT
SCALE 0 1 MI.

NOTES

ALL COORDINATES ARE GROUND BASED.

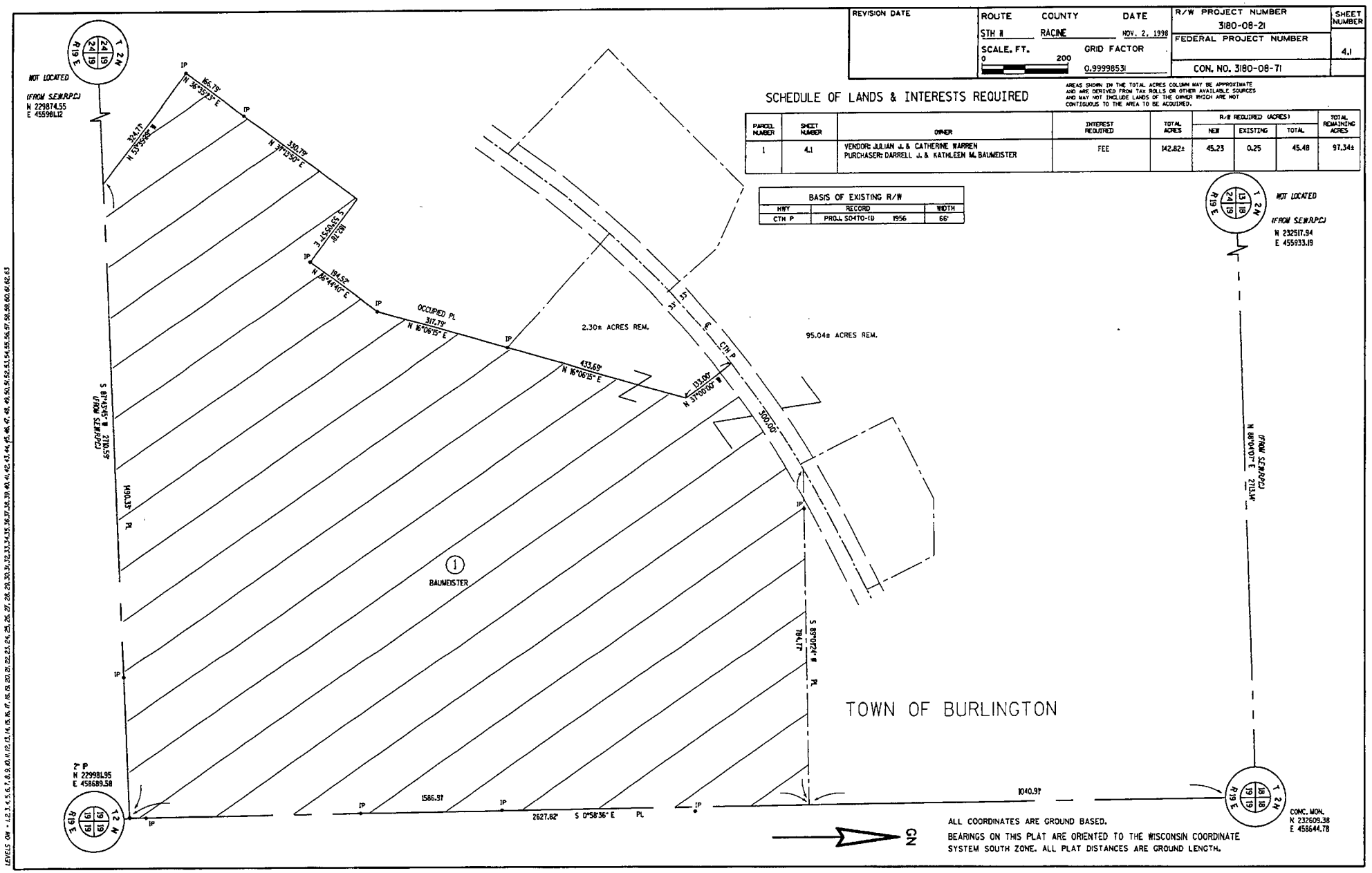
BEARINGS ON THIS PLAT ARE ORIENTED TO THE WISCONSIN COORDINATE SYSTEM SOUTH ZONE. ALL PLAT DISTANCES ARE GROUND LENGTH AND MAY BE CONVERTED TO GRID LENGTH BY MULTIPLYING THE THE DISTANCE BY THE GRID FACTOR PROVIDED ON THE DETAIL SHEETS.

RIGHT OF WAY MONUMENTS ARE AND ARE PLACED PRIOR TO OR AT THE TIME OF LAND TITLE TRANSFER.

RIGHT OF WAY BOUNDARIES ARE DEFINED WITH COURSES OF THE PERIMETER OF THE HIGHWAY LANDS REFERENCED TO THE U.S. PUBLIC LAND SURVEY OR OTHER SURVEYS OF PUBLIC RECORD.

REVISION DATE	STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
	APPROVED FOR DISTRICT OFFICE:
	DATE: 11/21/98 Michael G. Pietrzak

FILE NAME: RAC_SIGN ORIGINATOR: LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63 PLOT SCALE : ##.....DISTANCE#.....## PLOT DATE: ##...DISTANCE#...## REV. DATE:



LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

FILE NAME: HDONT CADD.DGN

EXHIBIT 3:
Special Provisions
for the
Baumeister Wetland Mitigation Site Construction

Special Provisions

Table of Contents

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9.	Seeding, Item SPV.0005.02.	5
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11.	Rootstock, Item SPV.0060.01	7
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15.	Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02	14

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 3180-08-71, City of Burlington Bypass (Wetland Mitigation – Baumeister Farm), located in the Town of Burlington, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2003 Edition, the Supplemental Specifications 2005 Edition, and these special provisions including the Additional Special Provisions (ASP's). The department considers only standard specifications, supplemental specifications and interim supplemental specifications issued directly from the department as valid for this contract.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.
(100105)

2. Scope of Work.

The work under this contract consists of construction of a site access point and wetland restoration at a 45.5-acre site and includes drain tile disablement, seedbed preparation, seeding, rootstock planting, rootstock protection and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract. (082003)

3. Prosecution and Progress

Begin work within 10 calendar days after the engineer issues a written notice to proceed.

Provide the start date to the engineer in writing within one month after executing the contract, but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within 10 calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

Proceed according to the following schedule of operations:

1. Install temporary site access point

2. Install erosion control
3. Install temporary stream crossings, if necessary
4. Disable drain tile (Suggested sequence: Complete drain tile exploration at each end of the main then disable the main. Locate and flag tile laterals as the main is disabled, then disable all lateral tiles).
5. Complete all work within the seeding and planting areas (October 7 to November 15, 2006)
6. Remove temporary crossings (if installed)
7. Install permanent access point
8. Restore disturbed areas

All topsoil stripped to construct the temporary site access point and tracking pad is to be placed in a neat pile on site with the project manager's approval. The pile should be near the entrance for the temporary site access point and will be removed by others.

4. Utilities

This contract is not subject to the provisions of Administrative Rule TRANS 220.

There are known utility facilities located adjacent to the project limits. Coordinate construction activities with a call to Diggers Hotline per statutes. Use caution to ensure the integrity of underground facilities and overhead lines. Bidders are advised to contact each utility listed in the plans prior to preparing their bids. The following is a list of the utilities with facilities in the area:

We Energies – Electric
We Energies has electric facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

We Energies – Gas Operations
We Energies has gas facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

SBC
SBC has a telephone line located in the right-of-way southeast of CTH P. The proposed work for the site access points is above this line. Although this facility is below the proposed work, it will not have any conflicts with the proposed work.

Time Warner Cable
Time Warner Cable has facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

5. Environmental Protection.

Section 107.18 of the Standard Specifications is supplemented as follows:

All equipment to be used on the site must be relatively free of material that may contain

weed seed, such as purple loosestrife or other non-native and/or invasive species, upon entering or exiting the site. Make equipment available for inspection by the engineer prior to operating within the mitigation site limits.

Provide the Erosion Control Implementation Plan (ECIP) 14 days prior to the Pre-Construction Conference.

Blanding's turtles are known to occur adjacent to the project area. If any Blanding's turtles are observed within the construction area, they should be immediately relocated out of the construction area and to a suitable location as approved by the engineer in the field.

Do no store or operate equipment, stockpile materials, or place settling basins in wetlands as shown on the plan, unless approved by the engineer.

Broom or brush any mud, dirt or debris deposited on CTH P or other roads, as a result of entering and leaving the construction site, as directed and approved by the engineer.

6. Steel Plate Beam Guard Class A.

Radii tighter than 75 feet shall be shop bent by the manufacturer prior to delivering the beam guard to the project site.
(082003) 614-020

7. Mulching

Perform this work in accordance with the Section 627 of the Standard Specifications, except as hereinafter modified.

Provide mulching material for all seeding areas, consisting of clean straw free of debris, with no weed seed, including reed canary grass, purple loosestrife, Canada thistle, giant reed grass, leafy spurge, spotted knapweed, box elder, buckthorn, or other non-native and/or invasive species.

Place mulch the same day of seeding. Where required, uniformly spread mulch over the seeded zones as indicated on the plan to a loose depth of ½ to 1½ inch by blowing from a machine, by hand, or as directed by the engineer.

8. Seed Bed Preparation, Item SPV.0005.01

A Description
This special provision describes preparing the seed bed for planting rootstock and seeding in the deep marsh zone, and seeding in the shallow marsh, wet meadow and tall grass prairie zones as shown on the plan and as hereinafter provided.

B Materials (Vacant)

C Construction Methods
Provide the engineer with 5 working days notice prior to any discing. Mow existing vegetation to within 6 inches of the ground surface. Work the upper 6 inches of topsoil at locations specified in the plan until the size of existing vegetation, stalks, leaves and other biomass does not exceed an average of 6 inches in size, or as directed by the engineer. Disc no more than 7 days prior to the time of seeding or as directed by the engineer. If planting does not occur within 7 days following discing, repeat specified discing (at the cost of the contractor) to ensure a proper seeding surface. Once discing has been performed, prohibit driving over the disced area with equipment or vehicles prior to seeding activities.

D Method of Measurement
The department will measure Seed Bed Preparation by the acre acceptably prepared.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.01	Seed Bed Preparation	Acre

Payment is full compensation for discing and firming the seed bed and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

9. Seeding, Item SPV.0005.02.

A Description
This special provision describes storing, mixing, sowing and raking the seed mix provided under Seed Mix, in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones as shown on the plans or as directed by the engineer. Perform seeding in accordance with the requirements hereinafter provided.

B Materials
Utilize native seed provided in accordance with Seed Mix, Item SPV.0085.01.

C Construction Methods
Mix the seed at the project site according to the seeding schedules specified under the item of Seed Mix, or as directed by the engineer. Sow seed after October 15, 2006 and prior to November 15, 2006. Do not seed in flooded areas or when conditions are otherwise unsatisfactory for seeding. Provide the engineer 5 working days' notice prior to any seeding activities.

Mix and sow seed on the same day. Sow cover crop and native seed together. Seed using Method A, Section 630.3.3.1 in the Standard Specifications and the following additional techniques.

C.1 Shallow Marsh Seeding Zone (5.96 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Deep Marsh Seeding Zone (4.21 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.3 Wet Meadow Seeding Zone (21.41 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Tall Grass Prairie Seeding Zone (5.05 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

D Measurement
The department will measure Seeding by the acre acceptably completed.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.02	Seeding	Acre

Payment is full compensation for handling, on-site storage of seed, weighing, mixing, sowing and raking; supplying water, sand, and/or sawdust for mixing seed; and for all labor, tools, equipment and incidentals necessary to complete the work.

10. Rootstock Protection, Item SPV.0005.03.

A Description

This special provision describes furnishing, installing, and maintaining Rootstock Protection according to the plan, and as directed by the project engineer. Install Rootstock Protection prior to the rootstock planting. Maintain Rootstock Protection throughout the life of the contract, as needed, or within 24 hours of notification by the engineer.

B Materials
Use posts consisting of 1-inch by 2-inch by 5-foot wooden stakes and cross members consisting of biodegradable, natural organic fiber bailing twine.

C Construction
Install posts a minimum of 2 feet into the ground or to a depth that secures the post and resists being pushed over. Install Rootstock Protection in such a manner as to provide grid-like patterns 10 feet by 20 feet through the area of the rootstock plantings. Extend the perimeter of the Rootstock Protection 2 feet in all directions beyond the limits of the rootstock plantings. Attach bailing twine for cross members to all posts as shown in the plan using knots or any other means approved by the engineer. Attach bailing twine to all intermediate posts by means approved by the engineer.

D Measurement
The department will measure Rootstock Protection per unit acre acceptable completed.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.03	Rootstock Protection	Acre

Payment is full compensation for furnishing all materials, installing posts, cross members, disposal of surplus materials; maintaining the Rootstock Protection through the life of the contract; and for all labor, tools, equipment, and incidentals necessary to install the Rootstock Protection.

11. Rootstock, Item SPV.0060.01

A Description
This special provision describes furnishing and planting wetland herbaceous plant rootstock of the species specified, complete in place in the deep marsh rootstock planting area as designated on the plans, or as directed by the engineer. It includes furnishing all necessary materials and performing all necessary work such as excavating plant holes, anchoring rootstock, and necessary care, such as trimming, required replacements pending acceptance, and such work necessary and incidental thereto to complete the item in accordance with the plans, specifications and contract.

B Materials

The source of all plant materials is nursery-grown stock, not wild-collected, from an area not to exceed 150 linear miles from the project site, and within the State of Wisconsin. All plants must be healthy, 1 to 2 years old, and have well-developed root systems. Plants that show evidence of mold, rot, freezing, or frost damage will be rejected. Where evidence is submitted that a specified rootstock cannot be obtained, substitutions may be made upon the specific approval of the engineer.

Deep Marsh (1.54 Acres)

Scientific Name	Common Name	Quantity
Scirpus atrovirens	blue green bulrush	500
Scirpus fluviatilis	river bulrush	500
Scirpus validus	softstem bulrush	500
Acorus calamus	duck potato	500
Sparganium eurycarpum	giant bur-reed	300
Pontedaria cordata	pickerelweed	200
Sagittaria latifolia	broad-leaved arrowhead	185
	Total:	2,685

C Construction Methods

Plant rootstock in the deep marsh planting zone prior to seeding and mulching operations and within the specified planting periods. Provide the engineer with 5 working days notice of the intended date of delivery of Rootstock to the project site. Present all rootstock to the engineer for inspection and partial acceptance prior to planting.

C.1 Timing

Plant wetland rootstock on the day of delivery at the project site. In the event that this is not possible, temporarily store plants by placing them in a well-ventilated, cool, shaded, moist storage space (not to exceed 48 hours).

C.2 Planting layout

Plant Rootstock at a density of approximately 1750 per acre within the deep marsh planting zone as shown in the plan or as directed by the engineer.

C.3 Planting Method

Plant Rootstock by hand with the use of a tree spud or other comparable method; or as directed by the engineer.

C.4 Care

Handle Rootstock with care and skill to prevent damage; keep moist and cool prior to planting. Do not disturb freshly planted Rootstock with subsequent activities that would cause uprooting or injury.

D Measurement

The department will measure Rootstock as each individual rootstock acceptably planted according to the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Rootstock	Each

Payment is full compensation for furnishing, delivering, storing and planting the plants and for furnishing all labor, tools, and equipment and incidentals necessary to complete the work.

12. Seed Mix, Item SPV.0085.01.

A Description
This special provision describes supplying native seed for planting in the deep and shallow marsh, wet meadow and tall grass seeding zones as indicated on the plan; supplying seed samples, germination test data and storage and delivery of seed; all in accordance with the special provisions provided herein.

B Material
Use the following native seed specifications during seed acquisition.

1. Provide native seed true to species, packed separately, with label information including scientific and common name, quantity, date and location picked, name and company supervising the picking.

2. Provide seed free of non-seed debris and of non-native and/or invasive species including, but not limited to, reed canary grass, purple loosestrife, spotted knapweed and Canada thistle.

3. Provide seed of local ecotype and origin no further than 150 linear miles from the project location, and from within the State of Wisconsin.

4. Provide seed that was picked at the appropriate time for ripeness and viability. Obtain germination test results and certification for a random sample of each species prior to receiving delivery of the seed. Provide written documentation of germination tests to the engineer prior to seeding.

5. Accept seed only if it has a minimum germination rate of 80 percent. If the seed does not meet the minimum required 80 percent germination rate, additional seed must be supplied at the cost of the seed supplier/contractor to meet the total viable seed quantity.

6. Deliver a representative sample of each species to the engineer for inspection and

identification prior to the acceptance of the seed.

7. Provide cover crop in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones consisting of perennial rye (*Lolium perenne*).

8. Use the following seeding schedule in each of the designated zones. Substitutions or changes to the seeding schedule must be approved by the engineer prior to seeding. All seed quantities provided assume a minimum 80% germination rate.

B.1 Seed Mixes
Seeding rates and mixes are as follows, or as directed by the engineer:

B.1.1 Shallow Marsh Seeding Zone (5.96 Acres)
The seed mix for the shallow marsh planting zone is composed of 71.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 119.2 pounds of cover crop in the shallow marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 71.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total shallow marsh seed mix.

Scientific Name	Common Name
Glyceria striata	manna grass
Alisma triviale	water plantain
Scirpus acutus	hard stem bulrush
Scirpus cyperinus	wool grass
Scirpus validus	softstem bulrush

B.1.2 Deep Marsh Seeding Zone (4.21 Acres)
The seed mix for the deep marsh planting zone is composed of 50.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 84.2 pounds of cover crop in the deep marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 50.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total deep marsh seed mix.

Scientific Name	Common Name
Scirpus atrovirens	blue green bulrush
Scirpus fluviatilis	river bulrush
Acorus calamus	duck potato
Sparganium eurycarpum	giant bur-reed
Pontedaria cordata	pickerelweed
Sagittaria latifolia	broad-leaved arrowhead
Zizania aquatica	wild rice

B.1.3 Wet Meadow Seeding Zone (21.41 Acres)

The seed mix for the wet meadow planting is composed of 85.64 pounds of sedges and rushes, 85.64 pounds of grasses and 85.64 pounds of forbs, for a total of 256.92 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 428.2 pounds of cover crop in the wet meadow seeding zone.

a. Sedges and Rushes. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total sedge and rush seed mix.

Scientific Name	Common Name
Carex comosa	bottlebrush sedge
Carex cristatella	crested oval sedge
Carex granularis	meadow sedge
Carex hystericina	porcupine sedge
Carex scoparia	lance-fruited oval sedge
Carex stipata	awl-fruited sedge
Carex vulpinoidea	fox sedge
Scirpus atrovirens	green bulrush
Scirpus validus	soft-stemmed bulrush

b. Grasses. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 3 species, with no individual species comprising more than 35% of the total grass seed mix.

Scientific Name	Common Name
Elymus canadensis	Canada wild rye
Glyceria striata	fowl manna grass
Calamagrostis canadensis	Canada blue joint
Leersia oryzoides	rice cut grass

c. Forbs. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 10 species, with no individual species comprising more than 15% of the total forb seed mix.

Scientific Name	Common Name
Solidago gigantea	giant goldenrod
Aster puniceus	bristly aster
Aster novae-angliae	New England aster
Helenium autumnale	sneezeweed
Verbena hastata	blue vervain
Mimulus ringens	monkey flower
Thalictrum dasycarpum	tall meadow rue
Vernonia fasciculata	ironweed
Angelica atropurpurea	angelica
Asclepias incarnata	marsh milkweed
Eupatorium maculatum	joe pye weed
Eupatorium perfoliatum	boneset

B.1.4 Tall Grass Prairie Seeding Zone (5.05 Acres)

The seed mix for the tall grass prairie seeding zone is composed of 40.40 pounds of grasses and 20.20 pounds of forbs, for a total of 60.60 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 101.00 pounds of cover crop in the tall grass prairie seeding zone.

Grasses. Seed at 8 pounds per acre for a total of 40.40 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total grass seed mix.

Scientific Name	Common Name
Andropogon gerardii	big bluestem
Bouteloua curtipendula	side oats grama
Elymus canadensis	Canada wild rye
Panicum virgatum	switch grass
Sorghastrum nutans	Indian grass
Sporobolus heterolepsis	prairie dropseed
Schizachyrium scoparium	little bluestem

Forbs. Seed at 4 pounds per acre for a total of 20.20 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total forb seed mix.

Scientific Name	Common Name
Desmodium canadense	tick clover
Echinacea purpurea	purple coneflower
Heliopsis helianthoides	oxeye sunflower
Monarda fistulosa	bergamot
Ratibida pinnata	yellow coneflower
Rudbeckia hirta	black-eyed susan
Solidago rigida	stiff goldenrod

C (Vacant)

D Measurement

The department will measure Seed Mix meeting the required 80 percent germination rate by actual pounds of native seed supplied.

Native seed not meeting the required 80 percent germination rate will be measured by the equivalent pounds, based on the following formula for each species.

Equivalent pounds =
(number of actual pounds of native seed supplied) X (actual percent germination rate/80)

E Basis of Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER DESCRIPTION UNIT

SPV.0085.01	Seed Mix	LB

Payment is full compensation for furnishing and delivery of native seed and cover crop to the project site, providing seed samples and germination data and the necessary labor, tools, equipment, and incidentals necessary to complete the work.

13. Drain Tile Disablement, Item SPV.0090.01

A Description

This special provision describes disabling the existing drain tile system by removing the cover soil and crushing the tile in place followed by filling the resulting trench as hereinafter provided.

B Materials (Vacant)

C Construction Methods

Disable drain tile prior to any seeding or planting in the specified seeding zones. Drain Tile Exploration, Item 612.0700 will be accomplished to verify the approximate location of the drain tile main as shown on the plans. Disable drain tile by excavating a trench as shown in the plans at the approximate location shown on the plan and as identified per Drain Tile Exploration, Item 612.0700. Utilize a back hoe or similar equipment to complete excavation. After drain tile has been exposed, crush the tile with a back hoe bucket or equivalent. Drain tile will be considered sufficiently crushed when no tile fragments greater than 6 inches in diameter remain. Once the engineer has verified that the tile has been sufficiently crushed, fill the resulting trench with the spoil removed during the tile excavation.

D Method of Measurement

The department will measure Drain Tile Disablement by the linear foot acceptably disabled.

E Basis of Payment

The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.01	Drain Tile Disablement	LF

Payment is full compensation for disabling drain tile, filling the resulting trench and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

14. Construction Staking Seeding and Planting Zones, Item SPV.0105.01

A Description

This special provision describes locating and staking the boundaries of the silt fence and seeding and planting zones as shown on the plans.

B Materials
Use wooden lath a minimum of 4 feet in length labeled with the appropriate information (station, location of seeding or planting zones).

C Construction Method
Once boundaries are located, install lath a minimum of 1 foot into the ground or to a depth that secures the lath and resists being pushed over. Stake boundaries of the seeding and planting zones at a minimum of 50-foot intervals or such intervals required to properly delineate boundaries.

D Method of Measurement
The department will measure Construction Staking Seeding and Planting Zones as a single lump sum unit for each construction staking acceptably completed.

E Basis of Payment
The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.01	Construction Staking Seeding and Planting Zones	LS

Payment is full compensation for furnishing all materials, locating boundaries, installing and labeling lath, and for all labor, tools, equipment, and incidentals necessary to complete the work required under this bid item.

15. Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02

A Description
This special provision describes excavating, filling, grading, shaping and compacting and finishing as necessary to construct the permanent site access point as shown on the plans, and in accordance with the pertinent requirements of the standard specifications and as hereinafter provided.

B (Vacant)

C Construction
Dispose of all surplus and unsuitable material in accordance with 205.3.12 of the standard specifications.

D Measurement
The department will measure Grading, Shaping and Finishing Permanent Site Access Point as a single complete unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.02	Grading, Shaping & Finishing Permanent Site Access Point	LS

Payment is full compensation for all excavation, grading, shaping, and compacting; providing and placing fill, salvaged topsoil, seed, and mulch; and for furnishing all labor, tools, equipment and incidentals necessary to complete the contract work.

The base course, surfacing and finishing items will be measured and paid for under the pertinent items provided in the contract.

BAUMEISTER WETLAND MITIGATION SITE

FIFTH YEAR MONITORING REPORT

DECEMBER 2011

Wisconsin Department of Transportation
Southeast District
141 NW Barstow Street
PO Box 798
Waukesha, WI 53187-0798

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1.0 INTRODUCTION

Construction of the Burlington Bypass (STH 11) required grading, filling and excavation for the new roadway and for vertical and horizontal realignment at intersecting roadways. The first phase of construction (*STH 11 Bypass Eastern Segment*) began in the spring of 2006 and resulted in unavoidable wetland loss totaling 37.10 acres. Prior to construction of this bypass segment, in 1997, the Wisconsin Department of Transportation (WisDOT) conducted a wetland mitigation site search. The Baumeister parcel (Site) was identified as a potential site for compensatory mitigation for wetland impacts associated with the STH 11 Bypass Eastern Segment. The 45.48-acre Site was subsequently purchased by the WisDOT, which restored wetland plant communities that likely occurred historically in this area and enhanced existing natural communities on other portions of the Site.

According to the U.S. Army Corps of Engineers correspondence (2006-2807-DJP) for this project, dated June 8, 2006, the project was designed to preserve 3.4 acres of existing wetlands and 3.91 acres of upland forest; restore 5.05 acres of upland to tall grass prairie, and restore approximately 33.12 acres of prior-converted wetlands. The project included drain tile disablement, and planting and seeding of the upland and wetland restoration areas. The expected wetland plant communities included in the construction plans were 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres of wet meadow, and 5.05 acres of tall grass prairie. During the construction phase of the project, the tall grass prairie restoration area was reduced to 3.65 acres. The remaining 1.4 acres intended for tall grass prairie restoration was preserved in its existing state.

Annual monitoring of the site is required for five years. During this period, public access to the site is prohibited. This third-year monitoring evaluates the third post-construction growing season hydrology and plant communities.

1.1 Site Description

Physical Description of Site

The 45.48-acre Site is located east of CTH P and north of Dyer Lake in the northwest 1/4 of Section 19, Township 2 North, Range 19 East (Figure 1). Dyer Lake is located approximately ½ mile south of the Site in Kenosha County and is connected to the Site by an unnamed tributary that flows in a northeast direction. The Site is bounded primarily by drainage ditches and an unnamed tributary that converge at its northeast corner where the drainage flows in a northeast direction and empties into Bohner Lake. The output from Bohner Lake is Spring Brook, which flows into the Fox River just south of the City of Burlington (Figure 1). Its watershed is an approximate 2.2 square mile area in which the primary land use is rural, including both agricultural and residential development. There are also a number of wetlands and small lakes in the watershed. The local watershed contributing to the Site consists of 69 acres of land.

The ditches were apparently constructed to convey water outputting from an extensive drain tile system that had been installed throughout the entire prior-converted wetland area. The banks and an approximate 25-foot wide strip of vegetation along the tributary and drainage ditches consisted of wet meadow, lowland forest and shrub carr wetland that were dominated by common buckthorn (*Rhamnus cathartica*), honeysuckle species (*Lonicera* spp.), reed canary grass (*Phalaris arundinacea*), and willow species (*Salix* spp.). Prior to construction, existing wetlands on the Site associated with the ditches and tributary totaled 3.40 acres. Uplands were present in the southern and western portions of the Site (5.05 acres), as well as a prior converted wetland that was typically planted in corn (33.12 acres).

During the construction phase, the drain tile system was disabled and the prior converted wetland restored to shallow marsh, deep marsh, and wet meadow. Upland areas were restored to tall grass prairie. The remainder of the Site consists of 3.91 acres of land that is upland forest, a constructed access point, and other areas not disturbed by the project. Existing wetlands and forested areas were preserved and the

entire Site will be managed throughout the 5-year monitoring period to control and eradicate non-native and invasive species.

Land Use
The majority of the Site was utilized for row crop agriculture. According to the previous landowner, the parcel was usually planted in corn. Land use adjacent to the Site consists of several residences, one commercial property, agricultural fields, existing wetlands, and woodlands.

Soils
The Soil Survey of Kenosha and Racine Counties, Wisconsin (Soil Survey) (USDA SCS 1970) identifies the following soil mapping units within the mitigation site: Houghton muck (Ht), Radford silt loam, 0 to 3 percent slopes (RaA), Casco-Rodman Complex, 20 to 35 percent slopes (CrE), Casco loam, 12 to 20 percent slopes, eroded (CeD2), and Fox loam, 6 to 12 percent slopes, eroded (FoC2) (Figure 2).

Houghton muck soils comprise the majority of the Site and consist of very poorly drained, deep, organic soils that have formed from the decomposition of grasses and sedges. Houghton muck soils generally form in broad depressions and basins and have poor internal drainage.

Radford soils are somewhat poorly drained and occupy small depressions, drainageways, and other wet areas that abut well-drained, eroded slopes. Radford soils typically have slow surface runoff, moderate permeability, and slow internal drainage. The Radford soils found on the Site are found on slopes ranging from 0 to 3 percent.

The Casco-Rodman complex and Casco soils on the Site consist of well-drained to excessively drained, loamy soils that have formed over calcareous sand and gravel outwash. They generally are found along the rim of glacial moraines and are mildly to moderately eroded. The Casco soils within the Site are found in steeper areas with slopes ranging from 12 to 20 percent (CeD2) and from 20 to 35 percent (CrE). The rate of runoff and potential for erosion is high in these soils.

Fox silt loam soils consist primarily of well-drained, loamy soils over calcareous sand and gravel outwash. The Fox soils found on the Site lie on gently sloping terrain ranging from 6 to 12 percent slopes and have a moderate potential for erosion and medium potential for runoff.

The Racine County hydric soils list indicates that Houghton muck is a hydric whole soil unit, while the list indicates that Radford silt loam has hydric inclusions of wetter soils. Houghton muck is also listed as hydric in *Hydric Soils of the United States,* a USDA Natural Resources Conservation Service publication.

1.2 Goals and Objectives
The primary construction goals established for the Baumeister wetland mitigation site were coordinated with the WDNR and focused on restoration of prior-converted wetlands to native wetland plant communities.

- The primary functional goals for the wetland mitigation site include:

    1) improve quality of water flowing into Bohner Lake
    2) expand the existing primary environmental corridor
    3) increase the amount and quality of wildlife habitat within the region

Specific goals developed during the design phase for the wetland mitigation site included:

- increase the level of significance for wetland functional values such as wildlife habitat, water quality, shoreline protection, aesthetics, and floral diversity by restoring the native plant communities (wet meadow, shallow marsh, deep marsh and tall grass prairie)

- enhance the value of wildlife habitat by managing vegetation to increase floral species diversity and decrease the area dominated by invasive species

- Provide habitat for grassland birds that are species of management concern (WDNR 1997).

The primary long-term objective for the Site is to establish a self-sustaining wetland by restoring an area of prior converted wetland to wet meadow, shallow marsh and deep marsh. Specific criteria for plant community establishment are as follows:

- At least 50 percent cover by desirable hydrophytic species by the 5th year following construction
- Establishment of at least 80 percent of the estimated wetland acreage shown in the plan
- At least 75 percent native species cover by the 5th year following construction

Criteria for success of the existing wetland management areas are as follows:

- elimination of all fruiting buckthorn and honeysuckle shrubs
- net reduction of the total areal coverage of reed canary grass by a minimum of 25%

In accordance with the Plans and Special Provisions (Exhibits 2 and 3, respectively), mitigation site construction began in September 2006 with drain tile disablement, followed by rootstock planting and seeding (Table 1). Site construction was completed in November 2006.

2.0 METHODS

2.1 Vegetation

Sampling of the Baumeister Site occurred on **8/25** and **8/26** of **2010; 8/25** and **9/15** of **2011.**

Plant species were identified and cover calculated using the line-intercept method. This method is useful for sampling grasses and sedges where individual counts can be tedious. Three transects were run across the Site (Figure 4). Plant species were identified starting at 0 meters and then every 20 meters along each transect. Cover, or the amount of physical space a given plant occupies, was measured in the following manner: a meter tape was laid on the transect line, and using the transect point as zero, plants were sampled from 1 to 2 meters and from 3 to 4 meters on both sides of the transect. Any plant that intercepted the vertical projection of these segments of the line was identified and its cover was measured as the length of the meter tape intercepted. Plant cover was recorded to the nearest decimeter (10th of a meter) that each species intercepted the line. All plant species identified on the wetland site during monitoring activities are included in a cumulative wetland species list (Table 2).

Percent cover, relative percent cover, and relative percent frequency were calculated for each species found on all of the transect lines (Tables 3-6). Percent cover for each species was measured by summing all of the vegetative cover for each transect line and dividing by the total sample length. Relative percent cover was estimated by dividing the cover value for each species by the total cover values of all species. Relative percent frequency was estimated by dividing the frequency value for a species by the total frequency values for all species. Plant species were grouped and compared according to their percent relative cover, wetland indicator status, and seed source (native vs. non-native). In order to maintain

consistency, all individuals that could only be identified to the level of genus were labeled as unknown when categorizing wetland indicator status, seed source, and life cycle. The following indicator status categories detail how plants were evaluated for their estimated probability of occurring in wetlands (Reed 1988):

Indicator Status	Indicator Status Symbol	Description
Obligate Wetland	OBL	almost always occurs in wetlands (estimated >99% probability) under natural conditions
Facultative Wetland (FACW)	FACW	usually occurs in wetlands (estimated 67-99% probability) but occasionally found in non-wetlands
Facultative (FAC)	FAC	equally likely to occur in wetlands (estimated 34-66% probability) or uplands
Facultative upland	FACU	usually occurs in non-wetlands, but occasionally found in wetlands (estimated 1-33% probability)
Obligate upland	UPL	almost never occurs in wetlands (estimated <1% probability)under natural conditions

A plus (+) or minus (-) symbol after a wetland indicator ranking shows a tendency toward the wetter or drier ranking, respectively. The indicator status rankings are based on the *National List of Plant Species that Occur in Wetlands: North Central (Region 3)* (Reed 1988).

2.2 Hydrology

Pre-construction hydrologic data included an engineering analysis to determine hydrology and depth to ground water. Monitoring wells were installed on site by WisDOT in 2003. A plan for restoration of wetland hydrology and the post-construction hydroperiod were developed based on the information gathered from the wells from April 2003 through September 2005. The site re-vegetation plan was then developed and based on the projected post-construction hydroperiod.
Hydrology will be further assessed during the fifth monitoring year wetland delineation and as necessary if plant community response is noted to be insufficient during the monitoring period.

2.3 Wildlife

Although not a specified activity in the Army Corps of Engineers permit, casual wildlife observations were recorded during monitoring activities. All wildlife identified was noted in a field notebook during pre-construction monitoring well/data collection and during post construction monitoring and management activities. Though undoubtedly incomplete, the data collected provides some measure of wildlife usage of the parcel.

3.0 RESULTS

3.1 Vegetation

The cumulative list of plant species identified on this site totals 138 species, a 50% increase from the recorded 92 species present in 2007 (Table 2). During five years of monitoring, 121 of the cumulative 131 species identified on the site have shown up in transect data. The 2011 monitoring transects intercepted a total of 62 species; 2009 transects captured 68 species while 2007 monitoring data totaled 58 species (Table 3). An analysis of the 2011 species recorded during sampling included 74 percent

perennials, 18 percent annuals, 5% biennials and 3% an annual/bi-annual combination. The total percent cover for all vegetation strata recorded in 2011 was 507.46% compared with 330.78% in 2007; this data substantiates an incredibly high level of vegetative density thoughtout the site.

Species intercepted by the vegetation transects were ordered from the most abundant to the least abundant in Table 4. Based on relative percent cover for 2010, the ten species in greatest abundance were rice cut-grass (*Leersia oryzoides*, 13.04%) fowl-manna grass (*Glyceria striata*, 11.18%), sneezeweed (*Helenium autumnale*, 7.50%), arrow-leaved tear thumb (*Polygonum sagittatum*, 7.09%), bristly aster (*Aster puniceus*, 4.06%), boneset (*Eupatorium perfoliatum*, 3.59%), (giant ragweed (*Ambrosia trifida*; 3.55%), common fox sedge (*Carex stipata*, 3.50%), smooth goldenrod (*Solidago gigantea*, 3.46%), Kentucky bluegrass (*Poa pratensis*, 2.95%). Three of the dominant native species (fowl manna grass, common sneezeweed, and common fox sedge) were absent in 2007 data; all were included in the native seed mix. The annual, giant ragweed, continues to decline from the relative cover value of 13.04% in 2007.

Other native species (ranking 12-15) from 2007 to the present include common arrow-head, (*Sagittaria latiflolia*, + 2.56%) in relative cover; black bulrush, (*Scirpus atrovirens*, + 2.25%), common flat-topped goldenrod (*Euthamia graminfolia*, + 2.07%), and wool grass (*Scirpus cyperinus*, +2.48%). In 2011, the top fifteen species in percent cover were 87% native; 87% perennial, and all are wetland indicator species. Eighty six percent fall into the OBL (13), FACW (5) category, and FAC (2). Eleven were native perennials, two native annuals and two non-native perennials (Giant ragweed and Kentucky bluegrass).

Table 5 shows species intercepted by the vegetation transects and sorted by wetland indicator status. Seventy nine percent of transect intercepted species are wetland indicators and tenty-one percent upland. Twenty seven obligate wetland plants represent 55% of the wetland indicator species, an increase of 11 species from 2007; percent relative cover (60.56%) is a 31.56 % increase in total relative cover from 2007 (29%). Sixteen of facultative wetland plants (FACW+, FACW and FACW-) had a total relative cover of 28.56%; an increase from 2009 (23.35%) and (20.55% in 2007). This wetland type accounts for 33% of total wetland vegetation. Facultative (FAC+ and FAC) plants totaled 6 (12% of total wetland plants) with a relative cover of 6.35%, a 21.18% decrease from 2007 (27.53%). Wetland indicator species have increased; they accounted for 79% of all plants intercepted in 2011; or 95.57% relative cover of all vegetation sampled (Figures 5a and 5b). Obligate species were 96% native and 85% perennials; the one exotic was an annual (Polygonum *hydropiper*, water-pepper).

Data was also sorted to examine the relative cover of native versus exotic (non-native) plant species (Table 6). Native vegetation consisted of 54 species; 87% of the vegetation intercepted by transects; the percent relative cover for natives is 93.73% this represents a 35 percent increase in relative cover when compared with 2007 (59.13%). The most abundant "percent cover" native species in 2007 included giant ragweed (43.14%) which has decreased to 17.99%. Percent relative cover of this species in 2007 (13.04%) decreased to 3.55% in 2011. Other notable changes in percent relative cover is eastern willow-herb which decreased from 9.22% (2007) to 1.05% in 2011. Common ragweed has decresed to 0.17% relative cover in 2011 from the 7.16% in 2007. Rice cut-grass ranks first for natives in (13.04%) relative cover from the 2007 6.89%, which is an increase of 6.15%. The other top species in 2011 for Relative Cover include four species which had a 0% in 2007; fowl-manna grass (*Glyceria striata)*, at 11.18%; common sneezeweed (*Helenium autumnale*) at 7.50% relative cover, bristly aster (*Aster puniceus*) 4.06%, and common fox sedge (*Carex stipata*) at 3.50%; other species include boneset (*Eupatorium perfoliatum*) at 3.59% relative cover, (0.01%) in 2007 and common arrow-head (*Sagittaria latifolia*) at 2.56% (0.01%) in 2007. Of 54 native species intercepted during the 2011 vegetation sampling, 80% are perennials and 81.5 % are wetland indicator species.

The relative percent cover of non-native species on the site (Figures 6a and 6b) showed a decrease to eight accounting for only 6.27% relative cover. This is a 34.6% decrease from 2007 when the first year

had a non-native 40.87% relative cover. In 2008, there was already a recorded 8.69% relative cover for these species. Percent cover of non-native species in 2011 was dominated by Kentucky blue grass (*Poa pratensis*) (2.95% relative cover), reed canary grass (*Phalaris arundinacea*) with 2.84% relative cover, common burdock (*Arctium minus*) at 0.18% and Canada thistle (*Circium arvense*) at 0.08%. In 2007 two dominants in this category, yellow foxtail (9.32%) and water pepper (*P. hydropiper*; (8.31%) are both now 0.04% relative cover. Green foxtail (*Setaria viridis*) was 7.65% in 2007 and is now deceased to 0% on line intercepts. Stinging nettle *(Urtica dioica)* is still a remnant along at 2.35% along the perimeter at the edge of the ditch. Queen Anne's lace *(Daucus carota)* is at 0.03% relative cover. Of the eight non-native species found on the site, 38% were perennials, 38% annuals, one is bi-annual and one is annual/bi-annual.

Special conditions in the Army Corps of Engineers permit require that vegetation cover maps at a scale of 1 inch equals 400 feet, or larger scale, be prepared for each growing season; since the restoration zones within the site are very similar to the construction plans, the original construction plan is still valid for the cover map (Figure 3). Three wetland plant communities are developing that include deep marsh, shallow marsh and wet meadow, as well as the upland tallgrass prairie.

The Army Corps of Engineers permit also includes a special condition that permanent photo-vantage points be established and representative photographs of the mitigation site be taken during the period between July 1 and September 30. Eight photo-vantage points were established and pictures were taken during the 2010-2011 growing season (Figures 4 and 7).

3.2 Hydrology

Meteorological data for the period from April through October (Table 7) indicates that precipitation was slightly higher (+1.05") for the 2010 growing season. One month was significantly above average (July, +3.83") and one below average (August, -3.12"). The 2011 had one month (August) with a deficit of 2.39" below the average. Throughout the growing season, precipitation was a 1.15" below average. For the annual precipitation totals, 31.74" was recorded for the annual precipitation in 2010; the average was 33.12"; the annual deficit was 1.38". A total of 35.69" was recorded for 2011; with a surplus of 2.57".

Average temperatures from April through October in 2010 were higher for six of the seven months (only September of that year was average) other months respectively were +5.7°F, +1.9°F, +1.5°F, +2.5°F, +3.5°F, and +2.5°F above normal. 2011 was more in sync with average monthly temperatures; May was 2.0" °F below average while June was 3.5°F above average. The annual average for 2012 recorded temperatures 43.20°F with an annual deviation of 4.3°F above average; The annual average temperature for 2011 was 46.40°F or 3.2. °F above average.

3.3 Wildlife

Observations made during the vegetation monitoring show that a number of animal species utilize the Site (Table 8). White-tailed deer (*Odocoileus virginianus),* a mammal, was sighted during field reviews as well as several amphibians including the American toad (*Bufo americanus*), green frog (*Rana clamitans)* and northern leopard frog (*Rana pipiens*). Invertebrates include the garden spider (*Argiope aurantia*), dragonflies to include green darner (*Anax junius*), skipper (*Hesperidae* family), and the tiger swallowtail (*Papilio glaucas*). Avifauna observed included great blue heron (*Ardea herodias*), red-tailed hawk (*Buteo jamaicensis*), chimney swift (*Chaetura pelagic*), marsh wren (*Cistothorus palustris*), American crow (*Corvus brachyrhynchos*), common yellowthroat (*Geothlypis trichas*), barn swallow (*Hirundo rustica*) and wild turkey (*Meleagris gallopavo*). There are numerous wildlife utilizing the parcel as evidenced by tracks and habitat needs; however, individual wildlife surveys are not conducted as part of the monitoring process.

4.0 DISCUSSION

4.1 Vegetation

Primary goals established for the Site during the design phase were to improve water quality and to decrease runoff into abutting tributaries by removal of an intricate network of drain tiles that carried sediment into an abutting tributary. The WisDOT was approached by the Lake Bohner Association to acquire the parcel for the purpose of mitigation and take it out of agricultural production. They noted that removal of the tiles would decrease sediment in the tributary that led into an inlet for Lake Bohner. The agreed upon goals with Lake Bohner were WisDOT acquisition of the parcel, removal of existing drain tiles and establishment of dense native vegetative.

The WisDOT explored mitigation potential of the parcel, and in spite of a complex acquisition, moved forward to assist the Lake Bohner Association, while addressing regulatory compliance to mitigate on/near site for the Burlington Bypass. **In addition, this goal would expland the primary environmental corridor and create more ADID wetlands (which have red flag status) in accordance with the EPA**. The mitigation parcel would serve to increase the amount and quality of regional wildlife habitat. These goals were met by the cessation of agricultural practices, expansion of both wetland plant communities and wildlife habitat, expansion of the existing environmental corridor. The restored wetlands naturally function to assist with soil stabilization and decrasing erodibility; the soils are organic Houghton muck. Other functions include stormwater retention, ground water retention due to dense vegetation and habitat value for a variety of species.

First-year monitoring results in 2007 indicated the Baumeister parcel had high vegetative cover and diversity with a total vegetation cover for all strata of 330.78 %. Percent cover continues to increase and the 2011 percent cover is now at 507.46 with 0% bare ground. Of the ten most prevalent species, 90% are native, eighty percent are perennials, and ninety percent are wetland indicator species with five of the 10 being Obligate, three being FACW, and one FAC+. The two annuals are arrow-leaved tearthumb (*Polygonum sagittatum*) which is a native (7.09%), and the other is giant ragweed (*Ambrosia trifida*), a native species which remains in the seed bank at 3.55% relative cover. This species has decreased since 2007 (13.04%); and showed a decrease in 2009 (3.46%); which indicates that management has an impact on this species. It is more dominant along the perimeter of the parcel since the interior is dominated by a diversity of robust well-established high quality natives. Of the top fifteen species, fourteen are wetland indicator species, 80% perennials, and eighty percent are native.

As noted earlier, native species account for 91.68% relative cover, an increase of 36% in two years (the 2007 cover was 55.63%). Of the total relative cover, 72% are perennials compared to the 2007 value of 63.4%; 21% are annuals. Sixty-eight species were intercepted on transects; and the overall number of cumulative species noted on-site increased to 122, an increase of 33%. The majority of the non-native species observed on the Site are typically found in abandoned agricultural areas. In terms of species richness, native vegetation dominates the site with 41 of the 58 species observed on the sample transects. Native flora is dominant and has increased to 91.68% and 54 species intercepted by transects. Only fourteen species comprise the non-native species intercepted during monitoring data collection.

Wetland indicator species, in combination, accounted for 97.05% of the relative cover and this is an increase of 20% from the 2007 (77.08%) relative cover of vegetation sampled. As noted earlier, 66.65% of the vegetation sampled are obligate wetland species totaling twenty-seven plants. This increase of 11 plants exemplifies the hydrology and favorable conditions on the site. Facultative wetland plants (FACW+, FACW and FACW-) stayed closer to the 2007 relative cover at 23.35% while facultative (FAC+ and FAC) plants decreased from 27.53% to 7.05%.

The high percentage of wetland indicator species (97.05% relative cover) indicates very favorable hydrologic conditions for establishment of wetland plant communities. The agricultural weed seed bank

continues to demonstrate gradual depletion with increased competition from perennial native wetland species.

As documented by monitoring efforts and noted earlier, reed canary grass is the dominant non-native with 2.06% relative cover. This species is more concentrated along the edges of the parcel near the ditches and near the parcel entrance. In the other areas, reed canary grass is evidenced by small individual stands. Because infiltration of reed canary grass is a threat to native species diversity if allowed to spread, management activities target this species with the application of herbicides and/or mowing to inhibit spread. Efforts to control the other non-desirable non-native perennial, stinging nettle included mowing. This species is dominant near the perimeter and long the ditch banks.

4.2 Hydrology

As part of the design process, hydrology was assessed to determine what sources of water contribute to the Site and affect the shallow ground water table. This information is important in determining re-vegetation plans because the depth of the shallow water table positively correlates with distribution of wetland vegetation. The water table at the Site is high, resulting in soil saturation to the surface and ponding in depressional areas during normal precipitation. Even though the degree of soil saturation fluctuates somewhat following precipitation events, the shallow ground water table remains at a fairly consistent level because its primary water source is from ground water discharge.

4.3 Wildlife

Wildlife diversity will continue to increase with the succession of a variety of habitats; the density of vegetation and prolific seed production provides an abundance of food and cover for numerous species. The dense cover also makes it difficult to observe species that are more secretive and smaller in size. In addition to the species observed during vegetation monitoring visits, waterfowl species and sandhill cranes (*Grus canadensis*) were observed in and adjacent to the Site during construction. Other wildlife observed included eastern milk snake (*Lampropeltis triangulum*), common gartersnake (*Thamnophis sirtalis*), Canada goose (*Branta canadensis*), and a variety of common migratory songbirds. The presence of woodchuck and muskrat burrows near the streambank indicate the presence of both species.

As noted earlier, the number of animal species recorded during vegetation monitoring is misleading due to the infrequency of visits. These brief monitoring visits provided only limited opportunities to observe wildlife, resulting in little information regarding the presence of herptiles, invertebrates and waterfowl.

5.0 CONCLUSION

I would like to provide an historical overview of our partnership with the Bohner Lake Association. WisDOT was approached by their representative, Dr. Jerry Kaster, in May1997 to encourage our Agency to consider acquisition of the Baumeister parcel for wetland mitigation. At that time, Dr. Kaster was a Professor of Aquatic Invertebrates at the University of Wisconsin – Milwaukee and the Center for Great Lakes Studies. It had been previously established that upstream agricultural lands (including the Baumeister parcel) were contributing silt and nutrients into the stream that borders the Baumeister property to the east. The stream feeds into Bohner Lake to the northeast; it originally had connected to Dyer Lake, however, land use changes disrupted this stream connection. Dr. Kaster felt that restoration of the Baumeister parcel would be beneficial in that cessation of agricultural practices on the parcel would eliminate one potential source of sediments into the Bohner Lake inlet.

WisDOT entered into a cooperative agreement with the Bohner Lake Association to acquire the Site and assumed the majority of the cost (85%) of acquisition. The partnership was a good faith effort by both parties towards a mutually beneficial goal focused on improving water quality. It was agreed that WisDOT would acquire the parcel, take it out of agricultural production and assume the financial responsibility to restore wetlands for mitigation credits. The Baumeister parcel would serve as mitigation

for wetland impacts associated with the Burlington Bypass. The Lake Association felt the reduction of silt and nutrient load would assist with water quality issues. They also agreed to be the perpetuity stewards once WisDOT finalizes regulatory mitigation and monitoring commitments. The Site boundaries are shown on the plat map basemap included on Figure 1.

WisDOT initially proposed the acquisition of two parcels owned by the Baumeisters to the east and west of CTH P; however, site acquisition was problematic due to plat and survey complexities on the western segment. This issue caused considerable delays in proposed scheduling. As a result, acquisition of the 45.23 acres currently owned by WisDOT did not occur until 2000. This obstacle incurred additional time and expenses; however, WisDOT was committed to acquiring the Site and eventually was successful in achieving that goal. In an effort to minimize colonization by non-native species, we contracted with the previous owner to continue cropping the Site prior to commencing our restoration project. Monitoring wells were installed to collect hydrologic data to inform the design process and allow for restoration of wetland hydrology during construction.

In 2006, the WisDOT restored the majority of the former Baumeister parcel to shallow marsh, deep marsh, and wet meadow; additionally, a small portion of upland was restored to tall grass prairie. Existing wetlands and forested areas that are part of the Site were preserved and the entire Site will be managed to control and eradicate non-native and invasive species. Specific goals developed during the design phase for the wetland mitigation site included:

- increase the level of significance for wetland functional values such as wildlife habitat, water quality, shoreline protection, aesthetics, and floral diversity by restoring the native plant communities

- enhance the value of wildlife habitat by managing vegetation to increase floral species diversity and decrease the area dominated by invasive species

- Provide habitat for grassland birds that are species of management concern

The restoration project did not include modifications to the drainage ditches or unnamed tributary. Of the ditches and stream that border the Site, WisDOT owns only the ditch to the north and to the mid-stream point in the tributary that borders the eastern boundary of the Site. The land surrounding the Site to the south and east is primary environmental corridor. Restoration of the prior-converted wetlands on the Site expanded the primary environmental corridor, providing botanical and habitat diversity for a variety of avian, invertebrate, and mammal species. The Site is protected by conservation covenants in cooperation with U.S. Army Corps of Engineers permitting. Since it serves as mitigation for wetland impacts associated with the Burlington Bypass, all restored prior-converted wetlands, existing wetlands, and upland buffers are included in the restoration commitments. The conservation easement is perpetual.

The Baumeister Wetland Mitigation Site shows is a high quality restoration that demonstrates the characteristics of a very successful fifth year mitigation site as demonstrated by monitoring data. Earlier dominant weedy species observed on the Site were typical for newly-restored abandoned agricultural areas. Non-native species are decreasing dramatically as native wetland vegetation dominates the Site. Hydrophytes which account for 97.05% of relative cover, is an objective indicator of both the hydrology and restoration success. Two-thirds of species intercepted by transects are obligate species. The established native vegetation is found in shallow marsh and fresh wet meadow wetlands. In terms of species richness, this restoration exemplifies the success of mitigation goals.

Annual weed species are expected to show a reduction in cover. This restoration has met our original commitments to the Lake Bohner Association to take the parcel out of agricultural production, disable

drain tiles, and to restore it to wetland with native vegetation.

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APPENDIX A:

Tables

Table 1. List of Species Planted at the Baumeister Wetland Mitigation Site

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS	OBSERVED ON SITE
SEED			
Wet Meadow Planting Zone			
Alisma triviale	water plantain	OBL	Yes
Angelica autropurpurea	pruple stemmed angelica	OBL	No
Asclepias incarnata	swamp-milkweed	OBL	Yes
Aster novae-angliae	New England aster	FACW	Yes
Aster puniceus	bristly aster	OBL	Yes
Calamagrostis canadensis	Canada bluejoint	OBL	Yes
Carex comosa	bottle brush sedge	OBL	Yes
Carex cristatella	crested oval sedge	OBL	No
Carex granularis	meadow sedge	FACW+	No
Carex hystericina	porcupine sedge	OBL	No
Carex scoparia	lance-fruited oval sedge	FACW	Yes
Carex stipata	common fox sedge	OBL	Yes
Carex vulpinoidea	brown fox sedge	OBL	Yes
Elymus canadensis	Canada wild rye	FAC-	Yes
Eupatorium maculatum	joe pye weed	OBL	Yes
Eupatorium perfoliatum	boneset	FACW+	Yes
Glyceria striata	fowl-mannagrass	OBL	Yes
Helenium autumnale	common sneezeweed	FACW+	Yes
Leersia oryzoides	rice cut-grass	OBL	Yes
Mimulus ringens	Allegheny monkey-flower	OBL	Yes
Scirpus atrovirens	black bulrush	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Solidago gigantea	smooth goldenrod	FACW	Yes
Thalictrum dasycarpum	purple meadow-rue	FACW-	No
Verbena hastata	common (blue) vervain	FACW+	Yes
Vernonia fasciculata	smooth ironweed	FACW	Yes
Shallow Marsh			
Alisma triviale	northern water plantain	OBL	Yes
Glyceria striata	fowl-mannagrass	OBL	Yes
Scirpus acutus	hardstem-bulrush	OBL	Yes
Scirpus cyperinus	common wool grass	OBL	Yes
Scirpus validus	softstem-bulrush	OBL	Yes
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	Yes
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes
Zizania aquatica	wild rice	OBL	No
Tallgrass Prairie			
Andropogon gerardii	big bluestem	FAC-	Yes
Bouteloua curtipendula	side-oats gramma-grass	UPL	No
Desmodium canadense	Canadian tick-trefoil	FAC-	Yes
Echinacea purpurea	broad-leaved purple coneflower	UPL	No
Elymus canadensis	Canada wild rye	FAC-	Yes
Heliopsis helianthoides	sunflower-everlasting, false sunflower	UPL	No
Monarda fistulosa	wild bergamot	FACU	Yes
Panicum virgatum	switch grass	FAC+	Yes
Ratibida pinnata	globular coneflower	UPL	No
Rudbeckia hirta	black-eyed Susan	FACU	Yes
Schizachyrium scoparium	little bluestem	FACU-	No
Solidago rigida	stiff goldenrod	FACU-	Yes
Sorghastrum nutans	Indian grass	FACU+	Yes
Sporobolus heterolepis	prairie dropseed	FACU-	No
ROOTSTOCK			
Deep Marsh			
Acorus calamus	duck potato	OBL	No
Pontederia cordata	pickerel weed	OBL	Yes
Sagittaria latifolia	broad-leaf arrowhead	OBL	Yes
Scirpus atrovirens	green bulrush	OBL	Yes
Scirpus fluviatilis	river bulrush	OBL	Yes
Scirpus validus	soft stem bulrush	OBL	Yes
Sparganium eurycarpum	giant bur reed	OBL	Yes

Table 2. Cumulative List of Plant Species Identified at the Baumeister Wetland Mitigation Site 2006-2009

1 *Abutilon theophrasti*
2 *Acer negundo*
3 *Achillea millefolium*
4 *Agalinis tenuifolia*
5 *Agrostis gigantea*
6 *Alisma triviale*
7 *Alliaria petiolata*
8 *Amaranthus hybridus*
9 *Ambrosia artemisiifolia*
10 *Ambrosia trifida*
11 *Asclepias incarnata*
12 *Asclepias syriaca*
13 *Aster ericoides*
14 *Aster firmus*
15 *Aster lanceolatus*
16 *Aster novae-angliae*
17 *Aster pilosus*
18 *Barbarea vulgaris*
19 *Bidens cernua*
20 *Bidens comosa*
21 *Bidens frondosa*
22 *Bidens vulgata*
23 *Boehmeria cylindrica*
24 *Bromus inermis*
25 *Capsella bursa-pastoris*
26 *Carex bebbii*
27 *Carex comosa*
28 *Carex scoparia*
29 *Carex stipata*
30 *Carex vulpinoidea*
31 *Cerastium vulgatum*
32 *Chenopodium album*
33 *Cirsium arvense*
34 *Cirsium vulgare*
35 *Conus stolonifera*
36 *Conyza canadensis*
37 *Cornus racemosa*
38 *Cyperus bipartitus*
39 *Cyperus esculentus*
40 *Cyperus strigosus*
41 *Daucus carota*
42 *Desmodium canadense*
43 *Dipsacus sylvestris*
44 *Echinochloa crusgalli*
45 *Echinocystis lobata*
46 *Eleocharis erythropoda*
47 *Elymus canadensis*
48 *Elytrigia repens*
49 *Epilobium coloratum*
50 *Erigeron strigosus*
51 *Eupatorium maculatum*
52 *Eupatorium perfoliatum*
53 *Euthamia graminifolia*
54 *Festuca elatior*
55 *Fraxinus pensylvanica*
56 *Geum aleppicum*
57 *Geum canadense*
58 *Glyceria grandis*
59 *Glyceria striata*
60 *Helenium autumnale*
61 *Hordeum jubatum*
62 *Impatiens capensis*
63 *Juncus effusus*
64 *Juncus tenuis*
65 *Juncus torreyi*
66 *Lactuca serriola*
67 *Leersia oryzoides*
68 *Lolium temulentum*
69 *Lycopus americanus*
70 *Melilotus alba*
71 *Mentha arvensis*
72 *Mimulus ringens*
73 *Muhlenbergia mexicana*
74 *Oenothera biennis*
75 *Panicum capillare*
76 *Panicum dichotomiflorum*
77 *Penthorum sedoides*
78 *Phalaris arundinacea*
79 *Phleum pratense*
80 *Pilea pumila*
81 *Plantago major*
82 *Poa palustris*
83 *Poa pratensis*
84 *Polygonum amphibium*
85 *Polygonum hydropiper*
86 *Polygonum hydropiperoides*
87 *Polygonum lapathifolium*
88 *Polygonum pensylvanicum*
89 *Polygonum persicaria*
90 *Polygonum sagittatum*
91 *Potentilla norvegica*
92 *Rhamnus cathartica*
93 *Rorippa palustris*
94 *Rumex crispus*
95 *Sagittaria latifolia*
96 *Salix discolor*
97 *Salix x rubens*
98 *Scirpus atrovirens*
99 *Scirpus cyperinus*
100 *Scirpus fluviatilis*
101 *Scirpus validus*
102 *Scutellaria lateriflora*
103 *Setaria faberi*
104 *Setaria glauca*
105 *Setaria viridis*
106 *Solidago canadensis*
107 *Solidago gigantea*
108 *Sonchus asper*
109 *Sonchus oleraceus*
110 *Sparganium eurycarpum*
111 *Stachys palustris*
112 *Taraxacum officinale*
113 *Thlaspi arvense*
114 *Trifolium hybridum*
115 *Trifolium pratense*
116 *Trifolium repens*
117 *Typha angustifolia*
118 *Typha latifolia*
119 *Ulmus americana*
120 *Urtica dioica*
121 *Verbena hastata*
122 *Verbena urticifolia*

Table 3. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Open Water	Other	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	N/A	N/A	N/A	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**
VEGETATION																			
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.04	0.00	0.13%	0.02%	0.03%	0.01%	0.00%	0.72%	0.28%	0.15%	0.18%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00	0.00	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.00	0.00	0.46%	0.09%	1.61%	0.00%	0.00%	0.95%	0.14%	1.47%	0.00%	0.00%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00	0.00	0.00%	0.38%	0.11%	0.00%	0.00%	0.00%	0.14%	0.29%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.34	0.00	0.80%	0.00%	0.00%	0.09%	0.00%	1.19%	0.00%	0.00%	0.18%	0.00%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	0.47	0.85	7.16%	0.93%	0.30%	0.12%	0.17%	5.25%	1.54%	0.88%	0.54%	0.52%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.73	17.99	13.04%	5.41%	3.46%	3.58%	3.55%	6.92%	4.91%	3.37%	3.22%	3.14%
Arctium minus	common burdock	UPL	E	B	0.00	0.00	0.00	0.21	0.89	0.00%	0.00%	0.00%	0.06%	0.18%	0.00%	0.00%	0.00%	0.18%	0.17%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00	0.31	0.00%	0.10%	0.08%	0.00%	0.06%	0.00%	0.14%	0.15%	0.00%	0.17%
Asclepias syriaca	common milkweed	UPL	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.00	0.89	0.01%	0.00%	0.00%	0.00%	0.18%	0.24%	0.00%	0.00%	0.00%	0.17%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	9.96	8.17	0.00%	0.05%	0.83%	2.59%	1.61%	0.00%	0.14%	2.05%	3.58%	1.92%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	2.80	5.27	0.00%	0.02%	0.25%	0.73%	1.04%	0.00%	0.14%	0.59%	1.43%	1.57%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	1.95	5.36	0.06%	0.21%	0.96%	0.51%	1.06%	0.24%	0.98%	2.20%	1.07%	1.74%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.42	0.63	0.00%	0.00%	0.06%	0.11%	0.12%	0.00%	0.00%	0.15%	0.18%	0.35%
Aster puniceus	bristly aster	OBL	N	P	0.00	0.00	0.00	0.00	20.58	0.00%	0.00%	0.00%	0.00%	4.06%	0.00%	0.00%	0.00%	0.00%	4.70%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.00	0.00	0.21%	0.38%	0.10%	0.00%	0.00%	0.48%	0.28%	0.29%	0.00%	0.00%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	1.06	1.70	0.00%	0.09%	0.00%	0.28%	0.33%	0.00%	0.14%	0.00%	0.54%	0.52%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	0.00	0.00	1.30%	0.13%	0.40%	0.00%	0.00%	2.15%	0.42%	0.59%	0.00%	0.00%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00	0.94	0.00%	2.00%	0.91%	0.00%	0.18%	0.00%	2.38%	1.03%	0.00%	0.35%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	4.92	2.41	0.00%	1.82%	3.38%	1.28%	0.48%	0.00%	1.96%	3.52%	1.25%	0.70%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.72	3.30	0.00%	1.43%	2.74%	0.19%	0.65%	0.00%	0.98%	2.20%	0.36%	0.87%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.00	1.34	0.06%	0.00%	0.56%	0.00%	0.26%	0.24%	0.00%	0.44%	0.00%	0.70%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	9.79	17.77	0.00%	0.33%	3.85%	2.55%	3.50%	0.00%	0.42%	2.64%	2.33%	3.66%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	1.10	0.45	0.00%	1.61%	3.86%	0.29%	0.09%	0.00%	1.96%	3.08%	0.54%	0.17%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.08	0.00	0.00%	0.05%	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%	0.18%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.00	0.00	0.22%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.42	0.58	0.00%	0.09%	0.19%	0.11%	0.11%	0.00%	0.28%	0.44%	0.18%	0.35%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.00	0.00	0.03%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cuscuta gronovii	common dodder	[OBL]	N	A	0.00	0.00	0.00	0.00	0.22	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.17%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.59	0.00	0.90%	0.22%	0.13%	0.15%	0.00%	1.19%	0.70%	0.29%	0.54%	0.00%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	0.00	0.00	4.24%	0.86%	0.02%	0.00%	0.00%	4.53%	2.10%	0.15%	0.00%	0.00%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.04	0.13	0.39%	0.25%	0.36%	0.01%	0.03%	0.48%	0.70%	0.88%	0.18%	0.17%
Desmodium canadense	Canadian tick-trefoil	FAC-	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.00	0.00	0.15%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	0.00	0.00	1.33%	0.18%	0.04%	0.00%	0.00%	2.86%	0.70%	0.15%	0.00%	0.00%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00	0.00	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	1.06	0.00	0.00%	0.00%	0.20%	0.28%	0.00%	0.00%	0.00%	0.44%	0.54%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 3. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00	0.22	0.00%	0.09%	0.15%	0.00%	0.04%	0.00%	0.14%	0.29%	0.00%	0.17%
Elytrigia repens	quack-grass	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.36	5.31	9.22%	14.21%	2.77%	2.44%	1.05%	6.68%	8.42%	3.23%	3.94%	1.57%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.04	0.45	0.03%	1.26%	0.21%	0.01%	0.09%	0.24%	2.81%	0.73%	0.18%	0.17%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	1.23	1.25	0.00%	0.10%	0.00%	0.32%	0.25%	0.00%	0.28%	0.00%	0.72%	0.52%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	15.59	18.21	2.61%	2.19%	3.03%	4.06%	3.59%	2.39%	2.52%	3.52%	4.29%	3.83%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	14.24	12.72	0.44%	0.33%	1.34%	3.71%	2.51%	0.72%	0.56%	1.76%	3.22%	3.66%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00	0.31	0.00%	0.01%	0.00%	0.00%	0.06%	0.00%	0.14%	0.00%	0.00%	0.17%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	5.17	0.00	0.00%	0.08%	0.00%	1.35%	0.00%	0.00%	0.14%	0.00%	1.25%	0.00%
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	33.43	56.74	0.00%	12.73%	14.31%	8.71%	11.18%	0.00%	6.31%	6.30%	4.83%	6.62%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	24.70	38.08	0.00%	3.25%	4.77%	6.44%	7.50%	0.00%	4.21%	4.40%	5.01%	5.75%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	3.56	7.50	0.01%	0.19%	1.10%	0.93%	1.48%	0.24%	0.28%	0.73%	1.43%	1.74%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	3.39	0.45	0.00%	0.55%	1.06%	0.88%	0.09%	0.00%	0.84%	1.17%	0.89%	0.17%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Lactuca serriola	prickly lettuce	FAC	E	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	52.92	66.16	6.89%	14.50%	12.56%	13.79%	13.04%	4.77%	6.73%	6.60%	7.16%	7.84%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	4.92	4.02	0.06%	0.42%	0.49%	1.28%	0.79%	0.72%	1.12%	1.91%	2.68%	1.92%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00	0.40	0.00%	0.00%	0.24%	0.00%	0.08%	0.00%	0.00%	0.29%	0.00%	0.17%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	3.47	7.37	0.00%	0.00%	0.17%	0.91%	1.45%	0.00%	0.00%	0.73%	1.43%	1.74%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.00	1.43	0.03%	1.79%	0.48%	0.00%	0.28%	0.24%	3.65%	1.32%	0.00%	0.87%
Muhlenbergia frondosa	common satin grass	FACW	N	P	0.00	0.26	1.47	3.81	0.22	0.00%	0.07%	0.32%	0.99%	0.04%	0.00%	0.14%	0.29%	0.89%	0.17%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00	0.22	0.00%	0.05%	0.00%	0.00%	0.04%	0.00%	0.28%	0.00%	0.00%	0.35%
Onoclea sensibilis	sensitive fern	FACW	N	P	0.00	0.00	0.00	0.51	0.18	0.00%	0.00%	0.00%	0.13%	0.04%	0.00%	0.00%	0.00%	0.36%	0.17%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.00	0.00	0.07%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	0.00	0.00	1.69%	0.14%	0.00%	0.00%	0.00%	2.15%	0.14%	0.00%	0.00%	0.00%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.00	0.00	0.58%	1.48%	0.36%	0.00%	0.00%	0.95%	1.82%	0.59%	0.00%	0.00%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	6.14	14.42	0.28%	1.19%	2.06%	1.60%	2.84%	0.72%	1.40%	2.64%	2.33%	2.61%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	4.45	8.66	0.58%	0.00%	0.32%	1.16%	1.71%	0.48%	0.00%	0.29%	1.43%	1.92%
Plantago lanceolata	English plantain	FAC	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	14.83	8.48	0.00%	0.10%	2.84%	3.86%	1.67%	0.00%	0.14%	1.91%	2.15%	1.05%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	2.12	14.96	1.47%	2.52%	0.09%	0.55%	2.95%	0.95%	2.24%	0.15%	0.36%	1.92%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	5.34	6.65	0.27%	0.58%	1.39%	1.39%	1.31%	0.95%	1.26%	2.64%	2.33%	1.92%
Polygonum aviculare	common knotweed	FAC-	E	A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	3.43	0.22	8.31%	1.05%	1.28%	0.89%	0.04%	5.25%	0.84%	1.17%	0.72%	0.17%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	2.54	0.00	0.10%	2.08%	0.00%	0.66%	0.00%	0.24%	1.54%	0.00%	1.43%	0.00%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.51	0.09	0.01%	0.95%	0.03%	0.13%	0.02%	0.24%	0.84%	0.15%	0.36%	0.17%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.00	0.00	0.49%	0.10%	0.00%	0.00%	0.00%	0.72%	0.42%	0.00%	0.00%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	0.13	0.00	4.13%	0.03%	0.00%	0.03%	0.00%	5.49%	0.14%	0.00%	0.18%	0.00%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	28.39	35.98	1.29%	2.38%	3.26%	7.40%	7.09%	1.43%	2.24%	2.79%	5.19%	5.40%
Polygonum scandens	false buckwheat	FAC	N	P	0.00	0.00	0.00	0.76	1.34	0.00%	0.00%	0.00%	0.20%	0.26%	0.00%	0.00%	0.00%	0.54%	0.35%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.13	0.00	0.04%	0.25%	0.17%	0.03%	0.00%	0.72%	1.12%	0.88%	0.18%	0.00%
Rorippa palustris	common yellow-cress	OBL	N	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rudbeckia hirta	black-eyed Susan	FACU	N	B/P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 3. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted alphabetically)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	0.00	0.00	1.51%	1.74%	0.24%	0.00%	0.00%	3.10%	4.35%	1.32%	0.00%	0.00%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	13.22	12.99	0.01%	0.91%	2.22%	3.44%	2.56%	0.24%	0.98%	1.61%	2.33%	1.74%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.34	0.67	0.03%	0.00%	0.00%	0.09%	0.13%	0.24%	0.00%	0.00%	0.36%	0.35%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00	0.00	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	8.47	12.81	0.27%	7.03%	5.41%	2.21%	2.52%	0.72%	5.33%	4.55%	3.04%	2.79%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	11.78	12.59	0.00%	1.15%	2.21%	3.07%	2.48%	0.00%	1.26%	1.61%	1.97%	2.09%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	6.57	12.05	0.55%	1.35%	1.14%	1.71%	2.38%	0.72%	1.40%	1.17%	1.61%	2.09%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.31	1.34	1.11%	1.13%	0.76%	0.34%	0.26%	0.95%	1.54%	1.76%	0.89%	0.87%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	9.24	6.21	0.00%	0.08%	0.97%	2.41%	1.22%	0.00%	0.56%	1.91%	1.97%	2.09%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	0.64	0.00	4.71%	0.24%	0.00%	0.17%	0.00%	4.53%	0.42%	0.00%	0.36%	0.00%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	0.00	0.22	9.32%	1.00%	0.16%	0.00%	0.04%	7.40%	1.40%	0.44%	0.00%	0.17%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	1.06	0.00	7.65%	0.03%	0.00%	0.28%	0.00%	7.40%	0.14%	0.00%	0.72%	0.00%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	4.41	1.83	0.03%	0.11%	0.35%	1.15%	0.36%	0.24%	0.56%	1.61%	1.79%	0.87%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	10.59	17.54	0.34%	0.25%	0.47%	2.76%	3.46%	0.95%	0.84%	1.17%	3.04%	4.36%
Sonchus asper	prickly sow-thistle	FAC	E	A	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.21	0.00	0.09%	0.07%	0.06%	0.06%	0.00%	0.48%	0.28%	0.15%	0.18%	0.00%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	8.90	8.53	0.04%	0.28%	1.60%	2.32%	1.68%	0.24%	0.42%	1.32%	1.61%	1.39%
Spartina pectinata	prairie cord-grass	FACW+	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00	0.00	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Taraxacum officinale	common dandelion	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium hybridum	alsike clover	FAC-	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium pratense	red clover	UPL	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium repens	white clover	FACU+	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	1.48	2.86	0.00%	0.05%	0.05%	0.39%	0.56%	0.00%	0.14%	0.15%	0.89%	0.70%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.00	0.00	0.06%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.56	11.92	3.50%	1.06%	1.92%	0.93%	2.35%	4.53%	2.38%	3.08%	2.86%	3.31%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	6.69	4.06	1.41%	1.63%	2.97%	1.74%	0.80%	2.63%	2.10%	3.37%	2.86%	1.92%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.30	0.00	0.16%	0.00%	0.00%	0.08%	0.00%	0.24%	0.00%	0.00%	0.54%	0.00%
Vernonia fasciculata	smooth ironweed	FACW	N	P	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Total Vegetation					**330.78**	**395.15**	**458.49**	**383.77**	**507.46**	**100.00%**	**99.96%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**99.86%**	**100.00%**	**100.00%**	**100.00%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**383.77**	**507.46**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site

2007-2011 Vegetation Survey (sorted by decreasing percent cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Open Water	Other	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	N/A	N/A	N/A	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**
VEGETATION																			
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	52.92	66.16	6.89%	14.50%	12.56%	13.79%	13.04%	4.77%	6.73%	6.60%	7.16%	7.84%
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	33.43	56.74	0.00%	12.73%	14.31%	8.71%	11.18%	0.00%	6.31%	6.30%	4.83%	6.62%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	24.70	38.08	0.00%	3.25%	4.77%	6.44%	7.50%	0.00%	4.21%	4.40%	5.01%	5.75%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	28.39	35.98	1.29%	2.38%	3.26%	7.40%	7.09%	1.43%	2.24%	2.79%	5.19%	5.40%
Aster puniceus	bristly aster	OBL	N	P	0.00	0.00	0.00	0.00	20.58	0.00%	0.00%	0.00%	0.00%	4.06%	0.00%	0.00%	0.00%	0.00%	4.70%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	15.59	18.21	2.61%	2.19%	3.03%	4.06%	3.59%	2.39%	2.52%	3.52%	4.29%	3.83%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.73	17.99	13.04%	5.41%	3.46%	3.58%	3.55%	6.92%	4.91%	3.37%	3.22%	3.14%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	9.79	17.77	0.00%	0.33%	3.85%	2.55%	3.50%	0.00%	0.42%	2.64%	2.33%	3.66%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	10.59	17.54	0.34%	0.25%	0.47%	2.76%	3.46%	0.95%	0.84%	1.17%	3.04%	4.36%
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	2.12	14.96	1.47%	2.52%	0.09%	0.55%	2.95%	0.95%	2.24%	0.15%	0.36%	1.92%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	6.14	14.42	0.28%	1.19%	2.06%	1.60%	2.84%	0.72%	1.40%	2.64%	2.33%	2.61%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	13.22	12.99	0.01%	0.91%	2.22%	3.44%	2.56%	0.24%	0.98%	1.61%	2.33%	1.74%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	8.47	12.81	0.27%	7.03%	5.41%	2.21%	2.52%	0.72%	5.33%	4.55%	3.04%	2.79%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	14.24	12.72	0.44%	0.33%	1.34%	3.71%	2.51%	0.72%	0.56%	1.76%	3.22%	3.66%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	11.78	12.59	0.00%	1.15%	2.21%	3.07%	2.48%	0.00%	1.26%	1.61%	1.97%	2.09%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	6.57	12.05	0.55%	1.35%	1.14%	1.71%	2.38%	0.72%	1.40%	1.17%	1.61%	2.09%
Urtica dioica	stinging nettle	FAC+	E	P	11.57	4.18	8.79	3.56	11.92	3.50%	1.06%	1.92%	0.93%	2.35%	4.53%	2.38%	3.08%	2.86%	3.31%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	4.45	8.66	0.58%	0.00%	0.32%	1.16%	1.71%	0.48%	0.00%	0.29%	1.43%	1.92%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	8.90	8.53	0.04%	0.28%	1.60%	2.32%	1.68%	0.24%	0.42%	1.32%	1.61%	1.39%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	14.83	8.48	0.00%	0.10%	2.84%	3.86%	1.67%	0.00%	0.14%	1.91%	2.15%	1.05%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	9.96	8.17	0.00%	0.05%	0.83%	2.59%	1.61%	0.00%	0.14%	2.05%	3.58%	1.92%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	3.56	7.50	0.01%	0.19%	1.10%	0.93%	1.48%	0.24%	0.28%	0.73%	1.43%	1.74%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	3.47	7.37	0.00%	0.00%	0.17%	0.91%	1.45%	0.00%	0.00%	0.73%	1.43%	1.74%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	5.34	6.65	0.27%	0.58%	1.39%	1.39%	1.31%	0.95%	1.26%	2.64%	2.33%	1.92%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	9.24	6.21	0.00%	0.08%	0.97%	2.41%	1.22%	0.00%	0.56%	1.91%	1.97%	2.09%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	1.95	5.36	0.06%	0.21%	0.96%	0.51%	1.06%	0.24%	0.98%	2.20%	1.07%	1.74%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.36	5.31	9.22%	14.21%	2.77%	2.44%	1.05%	6.68%	8.42%	3.23%	3.94%	1.57%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	2.80	5.27	0.00%	0.02%	0.25%	0.73%	1.04%	0.00%	0.14%	0.59%	1.43%	1.57%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	6.69	4.06	1.41%	1.63%	2.97%	1.74%	0.80%	2.63%	2.10%	3.37%	2.86%	1.92%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	4.92	4.02	0.06%	0.42%	0.49%	1.28%	0.79%	0.72%	1.12%	1.91%	2.68%	1.92%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.72	3.30	0.00%	1.43%	2.74%	0.19%	0.65%	0.00%	0.98%	2.20%	0.36%	0.87%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	1.48	2.86	0.00%	0.05%	0.05%	0.39%	0.56%	0.00%	0.14%	0.15%	0.89%	0.70%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	4.92	2.41	0.00%	1.82%	3.38%	1.28%	0.48%	0.00%	1.96%	3.52%	1.25%	0.70%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	4.41	1.83	0.03%	0.11%	0.35%	1.15%	0.36%	0.24%	0.56%	1.61%	1.79%	0.87%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	1.06	1.70	0.00%	0.09%	0.00%	0.28%	0.33%	0.00%	0.14%	0.00%	0.54%	0.52%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.00	1.43	0.03%	1.79%	0.48%	0.00%	0.28%	0.24%	3.65%	1.32%	0.00%	0.87%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.00	1.34	0.06%	0.00%	0.56%	0.00%	0.26%	0.24%	0.00%	0.44%	0.00%	0.70%
Polygonum scandens	false buckwheat	FAC	N	P	0.00	0.00	0.00	0.76	1.34	0.00%	0.00%	0.00%	0.20%	0.26%	0.00%	0.00%	0.00%	0.54%	0.35%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.31	1.34	1.11%	1.13%	0.76%	0.34%	0.26%	0.95%	1.54%	1.76%	0.89%	0.87%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	1.23	1.25	0.00%	0.10%	0.00%	0.32%	0.25%	0.00%	0.28%	0.00%	0.72%	0.52%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00	0.94	0.00%	2.00%	0.91%	0.00%	0.18%	0.00%	2.38%	1.03%	0.00%	0.35%
Arctium minus	common burdock	UPL	E	B	0.00	0.00	0.00	0.21	0.89	0.00%	0.00%	0.00%	0.06%	0.18%	0.00%	0.00%	0.00%	0.18%	0.17%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.00	0.89	0.01%	0.00%	0.00%	0.00%	0.18%	0.24%	0.00%	0.00%	0.00%	0.17%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	0.47	0.85	7.16%	0.93%	0.30%	0.12%	0.17%	5.25%	1.54%	0.88%	0.54%	0.52%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.34	0.67	0.03%	0.00%	0.00%	0.09%	0.13%	0.24%	0.00%	0.00%	0.36%	0.35%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.42	0.63	0.00%	0.00%	0.06%	0.11%	0.12%	0.00%	0.00%	0.15%	0.18%	0.35%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site

2007-2011 Vegetation Survey (sorted by decreasing percent cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.42	0.58	0.00%	0.09%	0.19%	0.11%	0.11%	0.00%	0.28%	0.44%	0.18%	0.35%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	1.10	0.45	0.00%	1.61%	3.86%	0.29%	0.09%	0.00%	1.96%	3.08%	0.54%	0.17%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.04	0.45	0.03%	1.26%	0.21%	0.01%	0.09%	0.24%	2.81%	0.73%	0.18%	0.17%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	3.39	0.45	0.00%	0.55%	1.06%	0.88%	0.09%	0.00%	0.84%	1.17%	0.89%	0.17%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00	0.40	0.00%	0.00%	0.24%	0.00%	0.08%	0.00%	0.00%	0.29%	0.00%	0.17%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00	0.31	0.00%	0.10%	0.08%	0.00%	0.06%	0.00%	0.14%	0.15%	0.00%	0.17%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00	0.31	0.00%	0.01%	0.00%	0.00%	0.06%	0.00%	0.14%	0.00%	0.00%	0.17%
Cuscuta gronovii	common dodder	[OBL]	N	A	0.00	0.00	0.00	0.00	0.22	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.17%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00	0.22	0.00%	0.09%	0.15%	0.00%	0.04%	0.00%	0.14%	0.29%	0.00%	0.17%
Muhlenbergia frondosa	common satin grass	FACW	N	P	0.00	0.26	1.47	3.81	0.22	0.00%	0.07%	0.32%	0.99%	0.04%	0.00%	0.14%	0.29%	0.89%	0.17%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00	0.22	0.00%	0.05%	0.00%	0.00%	0.04%	0.00%	0.28%	0.00%	0.00%	0.35%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	3.43	0.22	8.31%	1.05%	1.28%	0.89%	0.04%	5.25%	0.84%	1.17%	0.72%	0.17%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	0.00	0.22	9.32%	1.00%	0.16%	0.00%	0.04%	7.40%	1.40%	0.44%	0.00%	0.17%
Onoclea sensibilis	sensitive fern	FACW	N	P	0.00	0.00	0.00	0.51	0.18	0.00%	0.00%	0.00%	0.13%	0.04%	0.00%	0.00%	0.00%	0.36%	0.17%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.04	0.13	0.39%	0.25%	0.36%	0.01%	0.03%	0.48%	0.70%	0.88%	0.18%	0.17%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.51	0.09	0.01%	0.95%	0.03%	0.13%	0.02%	0.24%	0.84%	0.15%	0.36%	0.17%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.04	0.00	0.13%	0.02%	0.03%	0.01%	0.00%	0.72%	0.28%	0.15%	0.18%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00	0.00	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.00	0.00	0.46%	0.09%	1.61%	0.00%	0.00%	0.95%	0.14%	1.47%	0.00%	0.00%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00	0.00	0.00%	0.38%	0.11%	0.00%	0.00%	0.00%	0.14%	0.29%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.34	0.00	0.80%	0.00%	0.00%	0.09%	0.00%	1.19%	0.00%	0.00%	0.18%	0.00%
Asclepias syriaca	common milkweed	UPL	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.00	0.00	0.21%	0.38%	0.10%	0.00%	0.00%	0.48%	0.28%	0.29%	0.00%	0.00%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	0.00	0.00	1.30%	0.13%	0.40%	0.00%	0.00%	2.15%	0.42%	0.59%	0.00%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.08	0.00	0.00%	0.05%	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%	0.18%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.00	0.00	0.22%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.00	0.00	0.03%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.59	0.00	0.90%	0.22%	0.13%	0.15%	0.00%	1.19%	0.70%	0.29%	0.54%	0.00%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	0.00	0.00	4.24%	0.86%	0.02%	0.00%	0.00%	4.53%	2.10%	0.15%	0.00%	0.00%
Desmodium canadense	Canadian tick-trefoil	FAC-	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.00	0.00	0.15%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	0.00	0.00	1.33%	0.18%	0.04%	0.00%	0.00%	2.86%	0.70%	0.15%	0.00%	0.00%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00	0.00	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	1.06	0.00	0.00%	0.00%	0.20%	0.28%	0.00%	0.00%	0.00%	0.44%	0.54%	0.00%
Elytrigia repens	quack-grass	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	5.17	0.00	0.00%	0.08%	0.00%	1.35%	0.00%	0.00%	0.14%	0.00%	1.25%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Lactuca serriola	prickly lettuce	FAC	E	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.00	0.00	0.07%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	0.00	0.00	1.69%	0.14%	0.00%	0.00%	0.00%	2.15%	0.14%	0.00%	0.00%	0.00%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.00	0.00	0.58%	1.48%	0.36%	0.00%	0.00%	0.95%	1.82%	0.59%	0.00%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Plantago lanceolata	English plantain	FAC	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 4. Baumeister Wetland Mitigation Site

2007-2011 Vegetation Survey (sorted by decreasing percent cover)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Polygonum aviculare	common knotweed	FAC-	E	A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	2.54	0.00	0.10%	2.08%	0.00%	0.66%	0.00%	0.24%	1.54%	0.00%	1.43%	0.00%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.00	0.00	0.49%	0.10%	0.00%	0.00%	0.00%	0.72%	0.42%	0.00%	0.00%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	0.13	0.00	4.13%	0.03%	0.00%	0.03%	0.00%	5.49%	0.14%	0.00%	0.18%	0.00%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.13	0.00	0.04%	0.25%	0.17%	0.03%	0.00%	0.72%	1.12%	0.88%	0.18%	0.00%
Rorippa palustris	common yellow-cress	OBL	N	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rudbeckia hirta	black-eyed Susan	FACU	N	B/P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	0.00	0.00	1.51%	1.74%	0.24%	0.00%	0.00%	3.10%	4.35%	1.32%	0.00%	0.00%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00	0.00	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	0.64	0.00	4.71%	0.24%	0.00%	0.17%	0.00%	4.53%	0.42%	0.00%	0.36%	0.00%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	1.06	0.00	7.65%	0.03%	0.00%	0.28%	0.00%	7.40%	0.14%	0.00%	0.72%	0.00%
Sonchus asper	prickly sow-thistle	FAC	E	A	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.21	0.00	0.09%	0.07%	0.06%	0.06%	0.00%	0.48%	0.28%	0.15%	0.18%	0.00%
Spartina pectinata	prairie cord-grass	FACW+	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00	0.00	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Taraxacum officinale	common dandelion	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium hybridum	alsike clover	FAC-	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium pratense	red clover	UPL	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium repens	white clover	FACU+	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.00	0.00	0.06%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.30	0.00	0.16%	0.00%	0.00%	0.08%	0.00%	0.24%	0.00%	0.00%	0.54%	0.00%
Vernonia fasciculata	smooth ironweed	FACW	N	P	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Total Vegetation					**330.78**	**395.15**	**458.49**	**383.77**	**507.46**	**100.00%**	**99.96%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**99.86%**	**100.00%**	**100.00%**	**100.00%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**383.77**	**507.46**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Open Water	Other	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	N/A	N/A	N/A	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**
Obligate Wetland Vegetation (OBL)																			
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	52.92	66.16	6.89%	14.50%	12.56%	13.79%	13.04%	4.77%	6.73%	6.60%	7.16%	7.84%
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	33.43	56.74	0.00%	12.73%	14.31%	8.71%	11.18%	0.00%	6.31%	6.30%	4.83%	6.62%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	28.39	35.98	1.29%	2.38%	3.26%	7.40%	7.09%	1.43%	2.24%	2.79%	5.19%	5.40%
Aster puniceus	bristly aster	OBL	N	P	0.00	0.00	0.00	0.00	20.58	0.00%	0.00%	0.00%	0.00%	4.06%	0.00%	0.00%	0.00%	0.00%	4.70%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	9.79	17.77	0.00%	0.33%	3.85%	2.55%	3.50%	0.00%	0.42%	2.64%	2.33%	3.66%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	13.22	12.99	0.01%	0.91%	2.22%	3.44%	2.56%	0.24%	0.98%	1.61%	2.33%	1.74%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	8.47	12.81	0.27%	7.03%	5.41%	2.21%	2.52%	0.72%	5.33%	4.55%	3.04%	2.79%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	11.78	12.59	0.00%	1.15%	2.21%	3.07%	2.48%	0.00%	1.26%	1.61%	1.97%	2.09%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	6.57	12.05	0.55%	1.35%	1.14%	1.71%	2.38%	0.72%	1.40%	1.17%	1.61%	2.09%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	8.90	8.53	0.04%	0.28%	1.60%	2.32%	1.68%	0.24%	0.42%	1.32%	1.61%	1.39%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	9.96	8.17	0.00%	0.05%	0.83%	2.59%	1.61%	0.00%	0.14%	2.05%	3.58%	1.92%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	5.34	6.65	0.27%	0.58%	1.39%	1.39%	1.31%	0.95%	1.26%	2.64%	2.33%	1.92%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	9.24	6.21	0.00%	0.08%	0.97%	2.41%	1.22%	0.00%	0.56%	1.91%	1.97%	2.09%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.36	5.31	9.22%	14.21%	2.77%	2.44%	1.05%	6.68%	8.42%	3.23%	3.94%	1.57%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	2.80	5.27	0.00%	0.02%	0.25%	0.73%	1.04%	0.00%	0.14%	0.59%	1.43%	1.57%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	4.92	4.02	0.06%	0.42%	0.49%	1.28%	0.79%	0.72%	1.12%	1.91%	2.68%	1.92%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.72	3.30	0.00%	1.43%	2.74%	0.19%	0.65%	0.00%	0.98%	2.20%	0.36%	0.87%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	1.48	2.86	0.00%	0.05%	0.05%	0.39%	0.56%	0.00%	0.14%	0.15%	0.89%	0.70%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	4.92	2.41	0.00%	1.82%	3.38%	1.28%	0.48%	0.00%	1.96%	3.52%	1.25%	0.70%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	1.06	1.70	0.00%	0.09%	0.00%	0.28%	0.33%	0.00%	0.14%	0.00%	0.54%	0.52%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.00	1.43	0.03%	1.79%	0.48%	0.00%	0.28%	0.24%	3.65%	1.32%	0.00%	0.87%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.31	1.34	1.11%	1.13%	0.76%	0.34%	0.26%	0.95%	1.54%	1.76%	0.89%	0.87%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	1.23	1.25	0.00%	0.10%	0.00%	0.32%	0.25%	0.00%	0.28%	0.00%	0.72%	0.52%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	1.10	0.45	0.00%	1.61%	3.86%	0.29%	0.09%	0.00%	1.96%	3.08%	0.54%	0.17%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00	0.31	0.00%	0.10%	0.08%	0.00%	0.06%	0.00%	0.14%	0.15%	0.00%	0.17%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	3.43	0.22	8.31%	1.05%	1.28%	0.89%	0.04%	5.25%	0.84%	1.17%	0.72%	0.17%
Cuscuta gronovii	common dodder	OBL	N	A	0.00	0.00	0.00	0.00	0.22	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.17%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00	0.00	0.00%	0.38%	0.11%	0.00%	0.00%	0.00%	0.14%	0.29%	0.00%	0.00%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.00	0.00	0.21%	0.38%	0.10%	0.00%	0.00%	0.48%	0.28%	0.29%	0.00%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	1.06	0.00	0.00%	0.00%	0.20%	0.28%	0.00%	0.00%	0.00%	0.44%	0.54%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	5.17	0.00	0.00%	0.08%	0.00%	1.35%	0.00%	0.00%	0.14%	0.00%	1.25%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.00	0.00	0.58%	1.48%	0.36%	0.00%	0.00%	0.95%	1.82%	0.59%	0.00%	0.00%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	2.54	0.00	0.10%	2.08%	0.00%	0.66%	0.00%	0.24%	1.54%	0.00%	1.43%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00	0.00	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.00	0.00	0.06%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Rorippa palustris	common yellow-cress	OBL	N	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Obligate Wetland Vegetation					**95.93**	**275.93**	**305.60**	**239.11**	**307.32**	**29.00%**	**69.80%**	**66.65%**	**62.31%**	**60.56%**	**24.82%**	**52.73%**	**55.87%**	**55.10%**	**55.05%**
Facultative Wetland Vegetation (FACW+, FACW, FACW-)																			
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	24.70	38.08	0.00%	3.25%	4.77%	6.44%	7.50%	0.00%	4.21%	4.40%	5.01%	5.75%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	15.59	18.21	2.61%	2.19%	3.03%	4.06%	3.59%	2.39%	2.52%	3.52%	4.29%	3.83%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	10.59	17.54	0.34%	0.25%	0.47%	2.76%	3.46%	0.95%	0.84%	1.17%	3.04%	4.36%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	6.14	14.42	0.28%	1.19%	2.06%	1.60%	2.84%	0.72%	1.40%	2.64%	2.33%	2.61%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	14.24	12.72	0.44%	0.33%	1.34%	3.71%	2.51%	0.72%	0.56%	1.76%	3.22%	3.66%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	4.45	8.66	0.58%	0.00%	0.32%	1.16%	1.71%	0.48%	0.00%	0.29%	1.43%	1.92%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	14.83	8.48	0.00%	0.10%	2.84%	3.86%	1.67%	0.00%	0.14%	1.91%	2.15%	1.05%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	3.56	7.50	0.01%	0.19%	1.10%	0.93%	1.48%	0.24%	0.28%	0.73%	1.43%	1.74%

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	3.47	7.37	0.00%	0.00%	0.17%	0.91%	1.45%	0.00%	0.00%	0.73%	1.43%	1.74%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	1.95	5.36	0.06%	0.21%	0.96%	0.51%	1.06%	0.24%	0.98%	2.20%	1.07%	1.74%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	6.69	4.06	1.41%	1.63%	2.97%	1.74%	0.80%	2.63%	2.10%	3.37%	2.86%	1.92%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.00	1.34	0.06%	0.00%	0.56%	0.00%	0.26%	0.24%	0.00%	0.44%	0.00%	0.70%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.34	0.67	0.03%	0.00%	0.00%	0.09%	0.13%	0.24%	0.00%	0.00%	0.36%	0.35%
Muhlenbergia frondosa	common satin grass	FACW	N	P	0.00	0.26	1.47	3.81	0.22	0.00%	0.07%	0.32%	0.99%	0.04%	0.00%	0.14%	0.29%	0.89%	0.17%
Onoclea sensibilis	sensitive fern	FACW	N	P	0.00	0.00	0.00	0.51	0.18	0.00%	0.00%	0.00%	0.13%	0.04%	0.00%	0.00%	0.00%	0.36%	0.17%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.51	0.09	0.01%	0.95%	0.03%	0.13%	0.02%	0.24%	0.84%	0.15%	0.36%	0.17%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.00	0.00	0.46%	0.09%	1.61%	0.00%	0.00%	0.95%	0.14%	1.47%	0.00%	0.00%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	0.00	0.00	1.33%	0.18%	0.04%	0.00%	0.00%	2.86%	0.70%	0.15%	0.00%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	0.13	0.00	4.13%	0.03%	0.00%	0.03%	0.00%	5.49%	0.14%	0.00%	0.18%	0.00%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00	0.00	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00	0.00	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	0.00	0.00	1.30%	0.13%	0.40%	0.00%	0.00%	2.15%	0.42%	0.59%	0.00%	0.00%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.59	0.00	0.90%	0.22%	0.13%	0.15%	0.00%	1.19%	0.70%	0.29%	0.54%	0.00%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	0.00	0.00	4.24%	0.86%	0.02%	0.00%	0.00%	4.53%	2.10%	0.15%	0.00%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Vernonia fasciculata	smooth ironweed	FACW	N	P	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.04	0.00	0.13%	0.02%	0.03%	0.01%	0.00%	0.72%	0.28%	0.15%	0.18%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.00	0.00	0.03%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00	0.00	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	0.00	0.00	1.69%	0.14%	0.00%	0.00%	0.00%	2.15%	0.14%	0.00%	0.00%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.00	0.00	0.49%	0.10%	0.00%	0.00%	0.00%	0.72%	0.42%	0.00%	0.00%	0.00%
Spartina pectinata	prairie cord-grass	FACW+	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Facultative Wetland Vegetation					**67.99**	**48.54**	**107.07**	**112.25**	**144.91**	**20.55%**	**12.28%**	**23.35%**	**29.25%**	**28.56%**	**30.07%**	**19.50%**	**26.98%**	**31.31%**	**31.88%**
Facultative Vegetation (FAC, FAC+)																			
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.73	17.99	13.04%	5.41%	3.46%	3.58%	3.55%	6.92%	4.91%	3.37%	3.22%	3.14%
Urtica dioica	stinging nettle	FAC+	N	P	11.57	4.18	8.79	3.56	11.92	3.50%	1.06%	1.92%	0.93%	2.35%	4.53%	2.38%	3.08%	2.86%	3.31%
Polygonum scandens	false buckwheat	FAC	N	P	0.00	0.00	0.00	0.76	1.34	0.00%	0.00%	0.00%	0.20%	0.26%	0.00%	0.00%	0.00%	0.54%	0.35%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	3.39	0.45	0.00%	0.55%	1.06%	0.88%	0.09%	0.00%	0.84%	1.17%	0.89%	0.17%
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00	0.31	0.00%	0.01%	0.00%	0.00%	0.06%	0.00%	0.14%	0.00%	0.00%	0.17%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	0.00	0.22	9.32%	1.00%	0.16%	0.00%	0.04%	7.40%	1.40%	0.44%	0.00%	0.17%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Lactuca serriola	prickly lettuce	FAC	E	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Plantago lanceolata	English plantain	FAC	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sonchus asper	prickly sow-thistle	FAC	E	A	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.00	0.00	0.07%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.13	0.00	0.04%	0.25%	0.17%	0.03%	0.00%	0.72%	1.12%	0.88%	0.18%	0.00%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	0.00	0.00	1.51%	1.74%	0.24%	0.00%	0.00%	3.10%	4.35%	1.32%	0.00%	0.00%
Total Facultative Vegetation					**91.08**	**39.66**	**32.33**	**21.65**	**32.23**	**27.53%**	**10.03%**	**7.05%**	**5.64%**	**6.35%**	**23.15%**	**15.29%**	**10.41%**	**7.87%**	**7.32%**
Facultative Vegetation(FAC-)																			
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	2.12	14.96	1.47%	2.52%	0.09%	0.55%	2.95%	0.95%	2.24%	0.15%	0.36%	1.92%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.04	0.45	0.03%	1.26%	0.21%	0.01%	0.09%	0.24%	2.81%	0.73%	0.18%	0.17%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00	0.22	0.00%	0.09%	0.15%	0.00%	0.04%	0.00%	0.14%	0.29%	0.00%	0.17%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.00	0.00	0.22%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Polygonum aviculare	common knotweed	FAC-	E	A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	1.06	0.00	7.65%	0.03%	0.00%	0.28%	0.00%	7.40%	0.14%	0.00%	0.72%	0.00%

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 5. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by wetland indicator status)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Trifolium hybridum	alsike clover	FAC-	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Desmodium canadense	Canadian tick-trefoil	FAC-	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Facultative Vegetation					**31.13**	**15.45**	**2.07**	**3.22**	**15.63**	**9.41%**	**3.91%**	**0.45%**	**0.84%**	**3.08%**	**9.07%**	**5.33%**	**1.17%**	**1.25%**	**2.26%**
Facultative Upland Vegetation (FACU+, FACU, FACU-)																			
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	4.41	1.83	0.03%	0.11%	0.35%	1.15%	0.36%	0.24%	0.56%	1.61%	1.79%	0.87%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00	0.94	0.00%	2.00%	0.91%	0.00%	0.18%	0.00%	2.38%	1.03%	0.00%	0.35%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.00	0.89	0.01%	0.00%	0.00%	0.00%	0.18%	0.24%	0.00%	0.00%	0.00%	0.17%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	0.47	0.85	7.16%	0.93%	0.30%	0.12%	0.17%	5.25%	1.54%	0.88%	0.54%	0.52%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.42	0.63	0.00%	0.00%	0.06%	0.11%	0.12%	0.00%	0.00%	0.15%	0.18%	0.35%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00	0.40	0.00%	0.00%	0.24%	0.00%	0.08%	0.00%	0.00%	0.29%	0.00%	0.17%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00	0.22	0.00%	0.05%	0.00%	0.00%	0.04%	0.00%	0.28%	0.00%	0.00%	0.35%
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.08	0.00	0.00%	0.05%	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%	0.18%	0.00%
Elytrigia repens	quack-grass	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.21	0.00	0.09%	0.07%	0.06%	0.06%	0.00%	0.48%	0.28%	0.15%	0.18%	0.00%
Taraxacum officinale	common dandelion	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rudbeckia hirta	black-eyed Susan	FACU	N	B/P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	0.64	0.00	4.71%	0.24%	0.00%	0.17%	0.00%	4.53%	0.42%	0.00%	0.36%	0.00%
Trifolium repens	white clover	FACU+	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Facultative Upland Vegetation					**39.71**	**13.84**	**8.92**	**6.23**	**5.76**	**12.00%**	**3.50%**	**1.95%**	**1.62%**	**1.13%**	**10.74%**	**5.89%**	**4.25%**	**3.22%**	**2.79%**
Upland Vegetation (UPL)																			
Arctium minus	common burdock	UPL	E	B	0.00	0.00	0.00	0.21	0.89	0.00%	0.00%	0.00%	0.06%	0.18%	0.00%	0.00%	0.00%	0.18%	0.17%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.42	0.58	0.00%	0.09%	0.19%	0.11%	0.11%	0.00%	0.28%	0.44%	0.18%	0.35%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.04	0.13	0.39%	0.25%	0.36%	0.01%	0.03%	0.48%	0.70%	0.88%	0.18%	0.17%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.34	0.00	0.80%	0.00%	0.00%	0.09%	0.00%	1.19%	0.00%	0.00%	0.18%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.00	0.00	0.15%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Trifolium pratense	red clover	UPL	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Asclepias syriaca	common milkweed	UPL	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.30	0.00	0.16%	0.00%	0.00%	0.08%	0.00%	0.24%	0.00%	0.00%	0.54%	0.00%
Total Upland Vegetation					**4.95**	**1.72**	**2.50**	**1.31**	**1.61**	**1.50%**	**0.43%**	**0.55%**	**0.34%**	**0.32%**	**2.15%**	**1.12%**	**1.32%**	**1.25%**	**0.70%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**383.77**	**507.46**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N=native, E=exotic, P=perennial, B=biennial, A=annual, UNK=unknown, N/A=not applicable, NI=not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by origin Native vs. Non-Native)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
NON-VEGETATION																			
Open Water	Other	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bare Ground	Other	N/A	N/A	N/A	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Total Non-Vegetation					**0.00**	**0.15**	**0.00**	**0.00**	**0.00**	**0.00%**	**0.04%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.14%**	**0.00%**	**0.00%**	**0.00%**
NATIVE VEGETATION																			
Leersia oryzoides	rice cut-grass	OBL	N	P	22.79	57.31	57.59	52.92	66.16	6.89%	14.50%	12.56%	13.79%	13.04%	4.77%	6.73%	6.60%	7.16%	7.84%
Glyceria striata	fowl-mannagrass	OBL	N	P	0.00	50.34	65.60	33.43	56.74	0.00%	12.73%	14.31%	8.71%	11.18%	0.00%	6.31%	6.30%	4.83%	6.62%
Helenium autumnale	common sneezeweed	FACW+	N	P	0.00	12.84	21.85	24.70	38.08	0.00%	3.25%	4.77%	6.44%	7.50%	0.00%	4.21%	4.40%	5.01%	5.75%
Polygonum sagittatum	arrow-leaved tearthumb	OBL	N	A	4.26	9.40	14.96	28.39	35.98	1.29%	2.38%	3.26%	7.40%	7.09%	1.43%	2.24%	2.79%	5.19%	5.40%
Aster puniceus	bristly aster	OBL	N	P	0.00	0.00	0.00	0.00	20.58	0.00%	0.00%	0.00%	0.00%	4.06%	0.00%	0.00%	0.00%	0.00%	4.70%
Eupatorium perfoliatum	boneset	FACW+	N	P	8.63	8.66	13.88	15.59	18.21	2.61%	2.19%	3.03%	4.06%	3.59%	2.39%	2.52%	3.52%	4.29%	3.83%
Ambrosia trifida	giant ragweed	FAC+	N	A	43.14	21.38	15.86	13.73	17.99	13.04%	5.41%	3.46%	3.58%	3.55%	6.92%	4.91%	3.37%	3.22%	3.14%
Carex stipata	common fox sedge	OBL	N	P	0.00	1.31	17.67	9.79	17.77	0.00%	0.33%	3.85%	2.55%	3.50%	0.00%	0.42%	2.64%	2.33%	3.66%
Solidago gigantea	smooth goldenrod	FACW	N	P	1.13	0.97	2.16	10.59	17.54	0.34%	0.25%	0.47%	2.76%	3.46%	0.95%	0.84%	1.17%	3.04%	4.36%
Sagittaria latifolia	common arrow-head	OBL	N	P	0.05	3.58	10.17	13.22	12.99	0.01%	0.91%	2.22%	3.44%	2.56%	0.24%	0.98%	1.61%	2.33%	1.74%
Scirpus atrovirens	black bulrush	OBL	N	P	0.88	27.80	24.78	8.47	12.81	0.27%	7.03%	5.41%	2.21%	2.52%	0.72%	5.33%	4.55%	3.04%	2.79%
Euthamia graminifolia	common flat-topped goldenrod	FACW-	N	P	1.47	1.31	6.16	14.24	12.72	0.44%	0.33%	1.34%	3.71%	2.51%	0.72%	0.56%	1.76%	3.22%	3.66%
Scirpus cyperinus	wool-grass	OBL	N	P	0.00	4.55	10.13	11.78	12.59	0.00%	1.15%	2.21%	3.07%	2.48%	0.00%	1.26%	1.61%	1.97%	2.09%
Scirpus fluviatilis	river-bulrush	OBL	N	P	1.81	5.34	5.22	6.57	12.05	0.55%	1.35%	1.14%	1.71%	2.38%	0.72%	1.40%	1.17%	1.61%	2.09%
Urtica dioica	stinging nettle	FAC+	N	P	11.57	4.18	8.79	3.56	11.92	3.50%	1.06%	1.92%	0.93%	2.35%	4.53%	2.38%	3.08%	2.86%	3.31%
Pilea pumila	clearweed	FACW	N	A	1.91	0.00	1.47	4.45	8.66	0.58%	0.00%	0.32%	1.16%	1.71%	0.48%	0.00%	0.29%	1.43%	1.92%
Sparganium eurycarpum	giant bur-reed	OBL	N	P	0.15	1.12	7.33	8.90	8.53	0.04%	0.28%	1.60%	2.32%	1.68%	0.24%	0.42%	1.32%	1.61%	1.39%
Poa palustris	fowl meadow-grass	FACW+	N	P	0.00	0.41	13.02	14.83	8.48	0.00%	0.10%	2.84%	3.86%	1.67%	0.00%	0.14%	1.91%	2.15%	1.05%
Aster firmus	shining aster	OBL	N	P	0.00	0.19	3.79	9.96	8.17	0.00%	0.05%	0.83%	2.59%	1.61%	0.00%	0.14%	2.05%	3.58%	1.92%
Impatiens capensis	orange touch-me-not	FACW	N	A	0.05	0.75	5.04	3.56	7.50	0.01%	0.19%	1.10%	0.93%	1.48%	0.24%	0.28%	0.73%	1.43%	1.74%
Mentha arvensis	field-mint	FACW+	N	P	0.00	0.00	0.78	3.47	7.37	0.00%	0.00%	0.17%	0.91%	1.45%	0.00%	0.00%	0.73%	1.43%	1.74%
Polygonum amphibium	water smartweed	OBL	N	P	0.88	2.28	6.38	5.34	6.65	0.27%	0.58%	1.39%	1.39%	1.31%	0.95%	1.26%	2.64%	2.33%	1.92%
Scutellaria lateriflora	mad-dog skullcap	OBL	N	P	0.00	0.30	4.44	9.24	6.21	0.00%	0.08%	0.97%	2.41%	1.22%	0.00%	0.56%	1.91%	1.97%	2.09%
Aster novae-angliae	New England aster	FACW	N	P	0.20	0.82	4.40	1.95	5.36	0.06%	0.21%	0.96%	0.51%	1.06%	0.24%	0.98%	2.20%	1.07%	1.74%
Epilobium coloratum	eastern willow-herb	OBL	N	P	30.49	56.16	12.72	9.36	5.31	9.22%	14.21%	2.77%	2.44%	1.05%	6.68%	8.42%	3.23%	3.94%	1.57%
Aster lanceolatus	eastern lined aster	OBL	N	P	0.00	0.07	1.16	2.80	5.27	0.00%	0.02%	0.25%	0.73%	1.04%	0.00%	0.14%	0.59%	1.43%	1.57%
Verbena hastata	common (blue) vervain	FACW+	N	P	4.66	6.46	13.62	6.69	4.06	1.41%	1.63%	2.97%	1.74%	0.80%	2.63%	2.10%	3.37%	2.86%	1.92%
Lycopus americanus	American water-horehound	OBL	N	P	0.20	1.68	2.24	4.92	4.02	0.06%	0.42%	0.49%	1.28%	0.79%	0.72%	1.12%	1.91%	2.68%	1.92%
Carex comosa	bristly sedge	OBL	N	P	0.00	5.63	12.54	0.72	3.30	0.00%	1.43%	2.74%	0.19%	0.65%	0.00%	0.98%	2.20%	0.36%	0.87%
Typha angustifolia	narrow-leaved cat-tail	OBL	N	P	0.00	0.19	0.22	1.48	2.86	0.00%	0.05%	0.05%	0.39%	0.56%	0.00%	0.14%	0.15%	0.89%	0.70%
Carex bebbii	Bebb's oval sedge	OBL	N	P	0.00	7.20	15.47	4.92	2.41	0.00%	1.82%	3.38%	1.28%	0.48%	0.00%	1.96%	3.52%	1.25%	0.70%
Solidago canadensis	common goldenrod	FACU	N	P	0.10	0.45	1.59	4.41	1.83	0.03%	0.11%	0.35%	1.15%	0.36%	0.24%	0.56%	1.61%	1.79%	0.87%
Bidens comosa	strawstem beggar-ticks	OBL	N	A	0.00	0.37	0.00	1.06	1.70	0.00%	0.09%	0.00%	0.28%	0.33%	0.00%	0.14%	0.00%	0.54%	0.52%
Mimulus ringens	Allegheny monkey-flower	OBL	N	P	0.10	7.09	2.20	0.00	1.43	0.03%	1.79%	0.48%	0.00%	0.28%	0.24%	3.65%	1.32%	0.00%	0.87%
Carex scoparia	lance-fruited oval sedge	FACW	N	P	0.20	0.00	2.59	0.00	1.34	0.06%	0.00%	0.56%	0.00%	0.26%	0.24%	0.00%	0.44%	0.00%	0.70%
Polygonum scandens	false buckwheat	FAC	N	P	0.00	0.00	0.00	0.76	1.34	0.00%	0.00%	0.00%	0.20%	0.26%	0.00%	0.00%	0.00%	0.54%	0.35%
Scirpus validus	softstem-bulrush	OBL	N	P	3.68	4.48	3.49	1.31	1.34	1.11%	1.13%	0.76%	0.34%	0.26%	0.95%	1.54%	1.76%	0.89%	0.87%
Eupatorium maculatum	spotted joe-pye weed	OBL	N	P	0.00	0.41	0.00	1.23	1.25	0.00%	0.10%	0.00%	0.32%	0.25%	0.00%	0.28%	0.00%	0.72%	0.52%
Bidens vulgata	tall beggar-ticks	FACU	N	A	0.00	7.91	4.18	0.00	0.94	0.00%	2.00%	0.91%	0.00%	0.18%	0.00%	2.38%	1.03%	0.00%	0.35%
Aster ericoides	squarrose white aster	FACU-	N	P	0.05	0.00	0.00	0.00	0.89	0.01%	0.00%	0.00%	0.00%	0.18%	0.24%	0.00%	0.00%	0.00%	0.17%
Ambrosia artemisiifolia	common ragweed	FACU	N	A	23.68	3.66	1.38	0.47	0.85	7.16%	0.93%	0.30%	0.12%	0.17%	5.25%	1.54%	0.88%	0.54%	0.52%
Salix discolor	pussy-willow	FACW	N	P	0.10	0.00	0.00	0.34	0.67	0.03%	0.00%	0.00%	0.09%	0.13%	0.24%	0.00%	0.00%	0.36%	0.35%
Aster pilosus	awl-aster	FACU+	N	P	0.00	0.00	0.26	0.42	0.63	0.00%	0.00%	0.06%	0.11%	0.12%	0.00%	0.00%	0.15%	0.18%	0.35%
Carex vulpinoidea	brown fox sedge	OBL	N	P	0.00	6.38	17.72	1.10	0.45	0.00%	1.61%	3.86%	0.29%	0.09%	0.00%	1.96%	3.08%	0.54%	0.17%
Erigeron strigosus	rough fleabane	FAC-	N	A/B	0.10	5.00	0.95	0.04	0.45	0.03%	1.26%	0.21%	0.01%	0.09%	0.24%	2.81%	0.73%	0.18%	0.17%
Juncus tenuis	path-rush	FAC	N	P	0.00	2.16	4.87	3.39	0.45	0.00%	0.55%	1.06%	0.88%	0.09%	0.00%	0.84%	1.17%	0.89%	0.17%
Asclepias incarnata	swamp-milkweed	OBL	N	P	0.00	0.41	0.39	0.00	0.31	0.00%	0.10%	0.08%	0.00%	0.06%	0.00%	0.14%	0.15%	0.00%	0.17%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by origin Native vs. Non-Native)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Geum aleppicum	yellow avens	FAC+	N	P	0.00	0.04	0.00	0.00	0.31	0.00%	0.01%	0.00%	0.00%	0.06%	0.00%	0.14%	0.00%	0.00%	0.17%
Cuscuta gronovii	common dodder	[OBL]	N	A	0.00	0.00	0.00	0.00	0.22	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.17%
Elymus canadensis	Canada wild rye	FAC-	N	P	0.00	0.37	0.69	0.00	0.22	0.00%	0.09%	0.15%	0.00%	0.04%	0.00%	0.14%	0.29%	0.00%	0.17%
Muhlenbergia frondosa	common satin grass	FACW	N	P	0.00	0.26	1.47	3.81	0.22	0.00%	0.07%	0.32%	0.99%	0.04%	0.00%	0.14%	0.29%	0.89%	0.17%
Oenothera biennis	common evening-primrose	FACU	N	B	0.00	0.19	0.00	0.00	0.22	0.00%	0.05%	0.00%	0.00%	0.04%	0.00%	0.28%	0.00%	0.00%	0.35%
Onoclea sensibilis	sensitive fern	FACW	N	P	0.00	0.00	0.00	0.51	0.18	0.00%	0.00%	0.00%	0.13%	0.04%	0.00%	0.00%	0.00%	0.36%	0.17%
Polygonum lapathifolium	dock-leaved smartweed	FACW+	N	A	0.05	3.77	0.13	0.51	0.09	0.01%	0.95%	0.03%	0.13%	0.02%	0.24%	0.84%	0.15%	0.36%	0.17%
Acer negundo	boxelder	FACW-	N	P	0.44	0.07	0.13	0.04	0.00	0.13%	0.02%	0.03%	0.01%	0.00%	0.72%	0.28%	0.15%	0.18%	0.00%
Agalinis tenuifolia	common agalinis	FACW	N	A	0.00	0.26	0.00	0.00	0.00	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Alisma triviale	northern water-plantain	OBL	N	P	0.00	1.49	0.52	0.00	0.00	0.00%	0.38%	0.11%	0.00%	0.00%	0.00%	0.14%	0.29%	0.00%	0.00%
Asclepias syriaca	common milkweed	UPL	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bidens cernua	bur-marigold	OBL	N	A	0.69	1.49	0.47	0.00	0.00	0.21%	0.38%	0.10%	0.00%	0.00%	0.48%	0.28%	0.29%	0.00%	0.00%
Bidens frondosa	devil's beggar-ticks	FACW	N	A	4.31	0.52	1.85	0.00	0.00	1.30%	0.13%	0.40%	0.00%	0.00%	2.15%	0.42%	0.59%	0.00%	0.00%
Boehmeria cylindrica	false nettle	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Conyza canadensis	horseweed	FAC-	N	A	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cornus racemosa	northern swamp-dogwood	FACW-	N	P	0.10	0.00	0.00	0.00	0.00	0.03%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cyperus bipartitus	shining flat sedge	FACW+	N	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Cyperus esculentus	yellow nutsedge	FACW	N	P	2.99	0.86	0.60	0.59	0.00	0.90%	0.22%	0.13%	0.15%	0.00%	1.19%	0.70%	0.29%	0.54%	0.00%
Cyperus strigosus	false nutsedge	FACW	N	P	14.02	3.40	0.09	0.00	0.00	4.24%	0.86%	0.02%	0.00%	0.00%	4.53%	2.10%	0.15%	0.00%	0.00%
Desmodium canadense	Canadian tick-trefoil	FAC-	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Echinocystis lobata	wild cucumber	FACW-	N	A	0.00	0.00	0.65	0.00	0.00	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
Eleocharis erythropoda	red-rooted spike-rush	OBL	N	P	0.00	0.00	0.91	1.06	0.00	0.00%	0.00%	0.20%	0.28%	0.00%	0.00%	0.00%	0.44%	0.54%	0.00%
Geum canadense	white avens	FAC	N	P	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Glyceria grandis	American mannagrass	OBL	N	P	0.00	0.30	0.00	5.17	0.00	0.00%	0.08%	0.00%	1.35%	0.00%	0.00%	0.14%	0.00%	1.25%	0.00%
Juncus effusus	soft rush	OBL	N	P	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Juncus torreyi	Torrey's rush	FACW	N	P	0.00	0.15	0.00	0.00	0.00	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Panicum capillare	witch-grass	FAC	N	A	0.25	0.00	0.00	0.00	0.00	0.07%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Panicum dichotomiflorum	knee grass	FACW-	N	A	5.59	0.56	0.00	0.00	0.00	1.69%	0.14%	0.00%	0.00%	0.00%	2.15%	0.14%	0.00%	0.00%	0.00%
Penthorum sedoides	ditch-stonecrop	OBL	N	P	1.91	5.86	1.64	0.00	0.00	0.58%	1.48%	0.36%	0.00%	0.00%	0.95%	1.82%	0.59%	0.00%	0.00%
Polygonum hydropiperoides	false water-pepper	OBL	N	P	0.34	8.21	0.00	2.54	0.00	0.10%	2.08%	0.00%	0.66%	0.00%	0.24%	1.54%	0.00%	1.43%	0.00%
Polygonum pensylvanicum	Pennsylvania smartweed	FACW+	N	A	1.62	0.41	0.00	0.00	0.00	0.49%	0.10%	0.00%	0.00%	0.00%	0.72%	0.42%	0.00%	0.00%	0.00%
Potentilla norvegica	strawberry-weed	FAC	N	A/P	0.15	1.01	0.78	0.13	0.00	0.04%	0.25%	0.17%	0.03%	0.00%	0.72%	1.12%	0.88%	0.18%	0.00%
Rorippa palustris	common yellow-cress	OBL	N	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rudbeckia hirta	black-eyed Susan	FACU	N	B/P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Spartina pectinata	prairie cord-grass	FACW+	N	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Stachys palustris	hedge-nettle	OBL	N	P	0.00	0.11	0.00	0.00	0.00	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Typha latifolia	common cat-tail	OBL	N	P	0.20	0.00	0.00	0.00	0.00	0.06%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Verbena urticifolia	white vervain	UPL	N	A/P	0.54	0.00	0.00	0.30	0.00	0.16%	0.00%	0.00%	0.08%	0.00%	0.24%	0.00%	0.00%	0.54%	0.00%
Vernonia fasciculata	smooth ironweed	FACW	N	P	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Total Native Wetland Vegetation					**195.59**	**360.78**	**429.14**	**368.86**	**475.63**	**59.13%**	**91.27%**	**93.60%**	**96.11%**	**93.73%**	**58.47%**	**86.12%**	**90.62%**	**94.10%**	**94.25%**
EXOTIC VEGETATION																			
Poa pratensis	Kentucky-bluegrass	FAC-	E	P	4.85	9.96	0.43	2.12	14.96	1.47%	2.52%	0.09%	0.55%	2.95%	0.95%	2.24%	0.15%	0.36%	1.92%
Phalaris arundinacea	reed canary-grass	FACW+	E	P	0.93	4.70	9.44	6.14	14.42	0.28%	1.19%	2.06%	1.60%	2.84%	0.72%	1.40%	2.64%	2.33%	2.61%
Arctium minus	common burdock	UPL	E	B	0.00	0.00	0.00	0.21	0.89	0.00%	0.00%	0.00%	0.06%	0.18%	0.00%	0.00%	0.00%	0.18%	0.17%
Cirsium arvense	Canada-thistle	UPL	E	P	0.00	0.37	0.86	0.42	0.58	0.00%	0.09%	0.19%	0.11%	0.11%	0.00%	0.28%	0.44%	0.18%	0.35%
Melilotus alba	white sweet clover	FACU	E	A/B	0.00	0.00	1.08	0.00	0.40	0.00%	0.00%	0.24%	0.00%	0.08%	0.00%	0.00%	0.29%	0.00%	0.17%
Polygonum hydropiper	water-pepper	OBL	E	A	27.50	4.14	5.86	3.43	0.22	8.31%	1.05%	1.28%	0.89%	0.04%	5.25%	0.84%	1.17%	0.72%	0.17%
Setaria glauca	yellow foxtail	FAC	E	A	30.83	3.96	0.73	0.00	0.22	9.32%	1.00%	0.16%	0.00%	0.04%	7.40%	1.40%	0.44%	0.00%	0.17%
Daucus carota	Queen Anne's lace	UPL	E	B	1.27	0.97	1.64	0.04	0.13	0.39%	0.25%	0.36%	0.01%	0.03%	0.48%	0.70%	0.88%	0.18%	0.17%
Agrostis gigantea	redtop	FACW	E	P	1.52	0.37	7.37	0.00	0.00	0.46%	0.09%	1.61%	0.00%	0.00%	0.95%	0.14%	1.47%	0.00%	0.00%
Alliaria petiolata	garlic-mustard	FAC	E	B	0.15	0.00	0.00	0.00	0.00	0.04%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Amaranthus hybridus	smooth pigweed	UPL	E	A	2.65	0.00	0.00	0.34	0.00	0.80%	0.00%	0.00%	0.09%	0.00%	1.19%	0.00%	0.00%	0.18%	0.00%

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 6. Baumeister Wetland Mitigation Site
2007-2011 Vegetation Survey (sorted by origin Native vs. Non-Native)*

SCIENTIFIC NAME	COMMON NAME	Wetland Status	Native vs. Exotic	Perennial vs. Annual	Percent Cover					Relative Cover					Relative Frequency				
					2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Cerastium vulgatum	mouse-ear chickweed	FACU	E	P	0.00	0.19	0.00	0.08	0.00	0.00%	0.05%	0.00%	0.02%	0.00%	0.00%	0.14%	0.00%	0.18%	0.00%
Chenopodium album	lamb's quarters	FAC-	E	A	0.74	0.00	0.00	0.00	0.00	0.22%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Cirsium vulgare	bull-thistle	FACU-	E	B	0.00	0.00	0.17	0.00	0.00	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Dipsacus sylvestris	common teasel	UPL	E	B/P	0.49	0.00	0.00	0.00	0.00	0.15%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%
Echinochloa crusgalli	barnyard-grass	FACW	E	A	4.41	0.71	0.17	0.00	0.00	1.33%	0.18%	0.04%	0.00%	0.00%	2.86%	0.70%	0.15%	0.00%	0.00%
Elytrigia repens	quack-grass	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Festuca elatior	tall fescue	FACU+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Lactuca serriola	prickly lettuce	FAC	E	A/B	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Lolium temulentum	darnel rye grass	UPL	E	A	0.00	0.37	0.00	0.00	0.00	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Phleum pratense	timothy	FACU	E	P	0.00	0.19	0.00	0.00	0.00	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Plantago lanceolata	English plantain	FAC	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Plantago major	common plantain	FAC+	E	P	0.00	0.07	0.00	0.00	0.00	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Polygonum aviculare	common knotweed	FAC-	E	A	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Polygonum persicaria	lady's thumb	FACW	E	A	13.68	0.11	0.00	0.13	0.00	4.13%	0.03%	0.00%	0.03%	0.00%	5.49%	0.14%	0.00%	0.18%	0.00%
Rumex crispus	curly dock	FAC+	E	P	5.00	6.87	1.12	0.00	0.00	1.51%	1.74%	0.24%	0.00%	0.00%	3.10%	4.35%	1.32%	0.00%	0.00%
Salix x rubens	hybrid crack willow	FACW	E	P	0.00	0.00	0.22	0.00	0.00	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.15%	0.00%	0.00%
Setaria faberi	giant foxtail	FACU+	E	A	15.59	0.93	0.00	0.64	0.00	4.71%	0.24%	0.00%	0.17%	0.00%	4.53%	0.42%	0.00%	0.36%	0.00%
Setaria viridis	green foxtail	FAC-	E	A	25.29	0.11	0.00	1.06	0.00	7.65%	0.03%	0.00%	0.28%	0.00%	7.40%	0.14%	0.00%	0.72%	0.00%
Sonchus asper	prickly sow-thistle	FAC	E	A	0.00	0.00	0.00	0.08	0.00	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%
Sonchus oleraceus	common sow-thistle	FACU	E	A	0.29	0.26	0.26	0.21	0.00	0.09%	0.07%	0.06%	0.06%	0.00%	0.48%	0.28%	0.15%	0.18%	0.00%
Taraxacum officinale	common dandelion	FACU	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium hybridum	alsike clover	FAC-	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium pratense	red clover	UPL	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Trifolium repens	white clover	FACU+	E	P	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Exotic Vegetation					**135.20**	**34.37**	**29.35**	**14.92**	**31.83**	**40.87%**	**8.69%**	**6.40%**	**3.89%**	**6.27%**	**41.53%**	**13.74%**	**9.38%**	**5.90%**	**5.75%**
OVERALL TOTALS					**330.78**	**395.30**	**458.49**	**383.77**	**507.46**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

* N = native, E = exotic, P = perennial, B = biennial, A = annual, UNK = unknown, N/A = not applicable, NI = not inventoried

Table 7. Meteorological Data for the Baumeister Wetland Mitigation Site (2007-2011)

Normals and data obtained from National Climate Data Center (Burlington, Wisconsin)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Precipitation (in.)													
Normal	1.25	1.13	2.02	3.40	3.18	3.78	3.54	4.64	3.37	2.59	2.48	1.74	**33.12**
2007	0.86	1.36	3.21	4.03	1.99	3.64	1.40	7.92	1.93	2.96	0.04	N/A	**29.34**
2008	2.07	3.32	3.11	4.42	2.92	12.27	3.20	0.88	4.16	2.62	1.47	4.00	**44.44**
2009	1.42	2.01	3.50	4.85	2.98	4.45	2.39	4.46	1.34	5.90	1.76	1.05	**36.11**
2010	0.83	1.15	0.89	3.39	3.61	5.69	7.37	1.52	2.69	1.27	2.08	1.25	**31.74**
2011	0.69	3.12	3.46	4.38	2.82	3.41	4.55	2.25	4.38	1.55	2.99	2.11	**35.71**
Average Temperature (F)													
Normal	18.0	23.5	32.6	44.6	56.5	65.6	70.6	68.5	60.7	49.5	35.9	23.8	**43.20**
2007	23.0	12.4	35.0	42.5	59.5	67.8	69.2	69.6	62.8	54.5	34.7	N/A	**48.3***
2008	22.4	22.0	32.5	46.2	53.1	66.8	71.3	71.0	65.2	52.1	38.8	22.4	**44.29**
2009	10.6	23.5	33.7	43.7	56.5	64.3	64.4	66.1	60.8	45.5	41.2	22.8	**44.40**
2010	18.2	22.9	37.0	50.3	58.4	67.1	73.1	72.0	60.9	52.0	38.4	19.4	**47.50**
2011	17.0	20.9	31.8	43.4	54.5	65.7	74.1	69.1	59.2	51.0	39.6	30.3	**46.40**

Notes:

N/A = Data not available

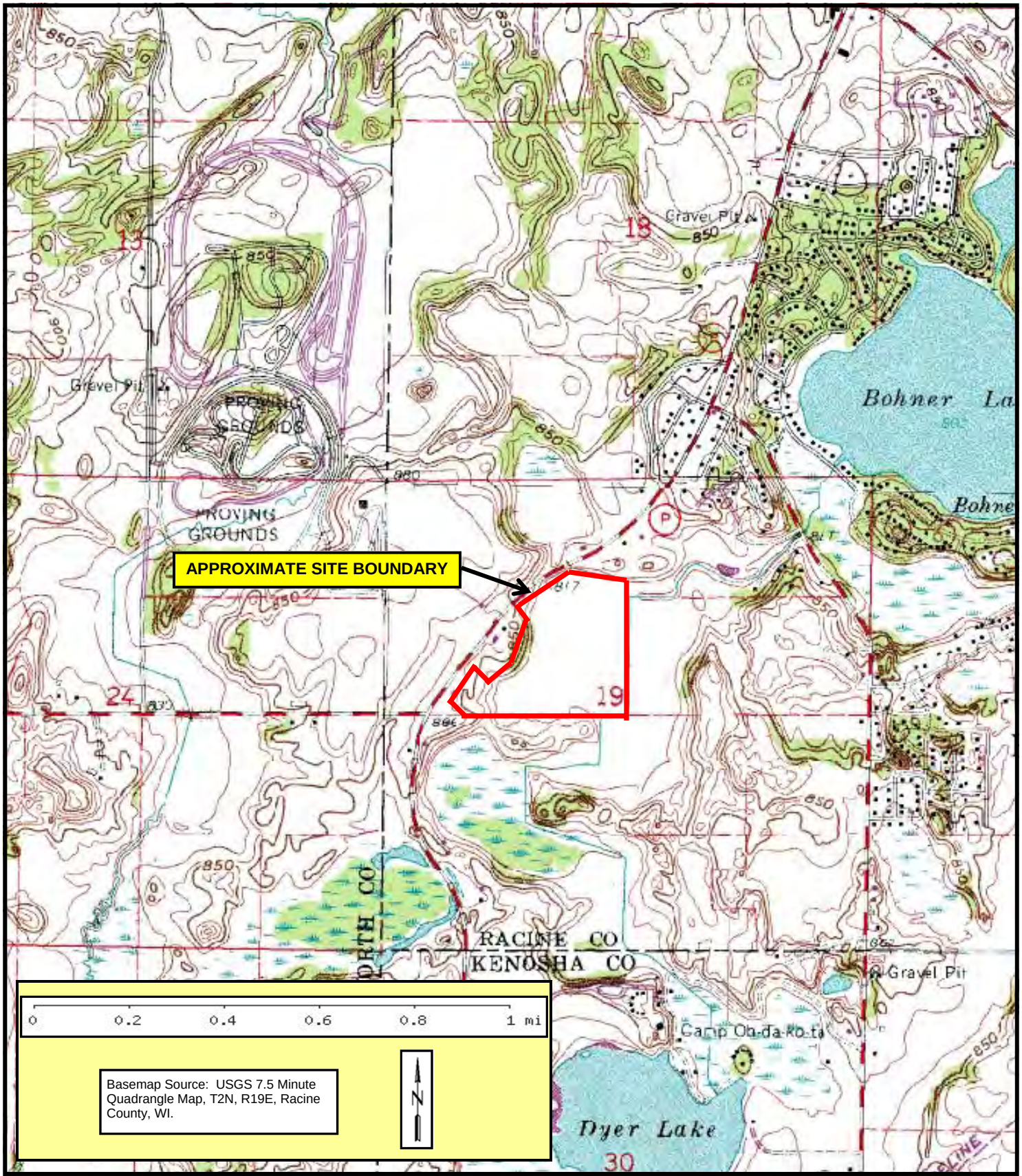
X = Monthly means or totals based on incomplete time series; 1-9 days missing.

Table 8. List of Wildlife Species Observed at the Baumeister Wetland Mitigation Site 2007-2011

Scientific Name	Common Name	Evidence
Invertebrates		
Anax junius	green darner	visual
Argiope aurantia	garden spider	visual
Hesperiidae (Family)	skipper	visual
Papilio glaucas	tiger swallowtail	visual
Amphibians		
Bufo americanus	American toad	visual
Lampropeltis triangulum	milk snake	visual
Rana clamitans	green frog	visual
Rana pipiens	Northern Leopard Frog	visual
Thamnophis sirtalis	gartersnake	visual
Birds		
Ardea herodias	great blue heron	visual
Branta canadensis	Canada goose	visual
Buteo jamaicensis	red-tailed hawk	visual
Chaetura pelagica	chimney swift	visual
Cistothorus palustris	marsh wren	visual
Corvus brachyrhynchos	American crow	visual
Geothlypis trichas	common yellowthroat	visual
Grus canadensis	sandhill crane	visual
Hirundo rustica	barn swallow	visual
Meleagris gallopavo	Wild turkey	visual
Mammals		
Odocoileus virginianus	whitetail deer	tracks

APPENDIX B:

Figures

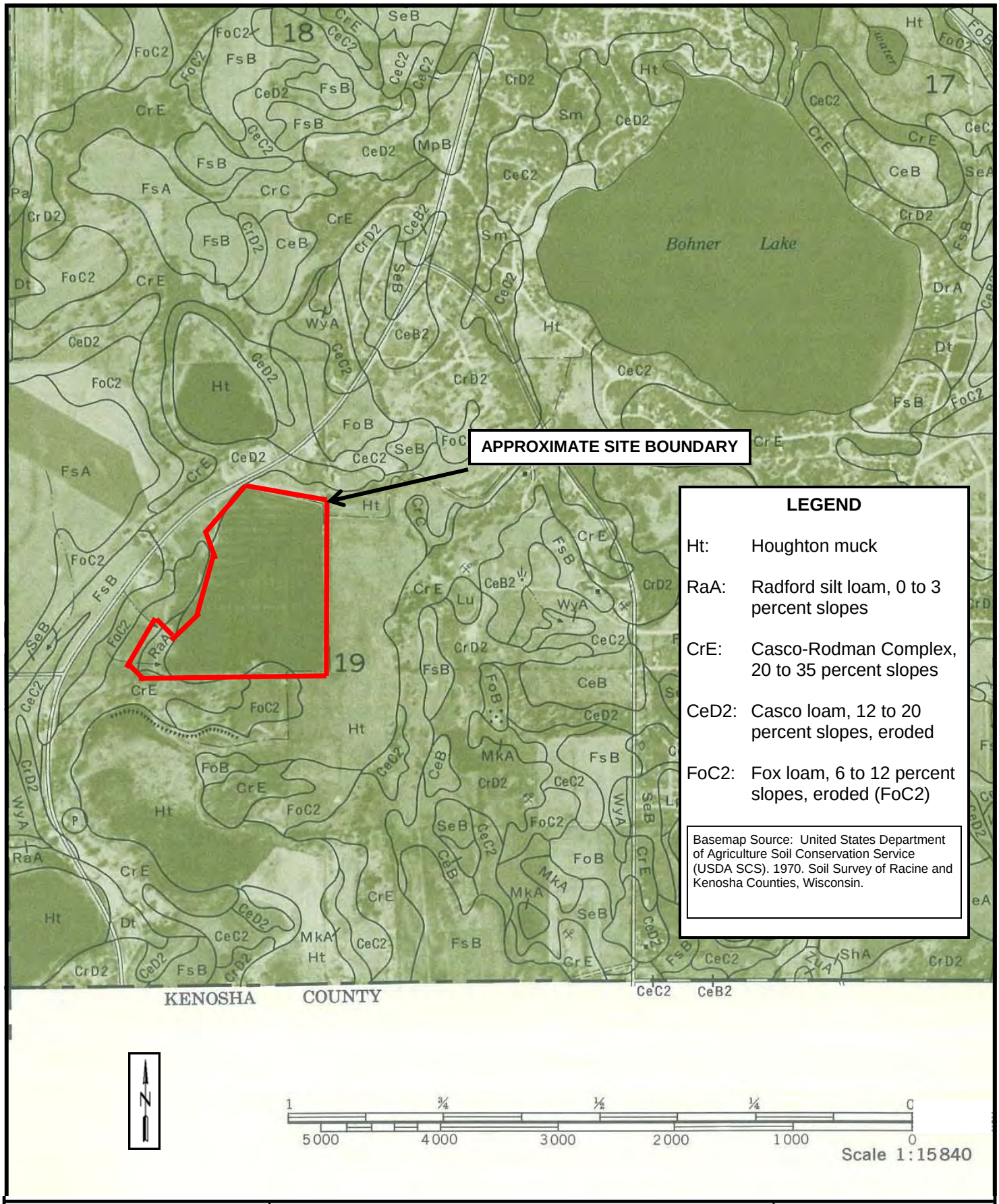


TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 1: PROJECT LOCATION

FILE NAME: FIGURE_05.DWG



TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 2: SOILS MAP

FILE NAME: FIGURE_05.DWG

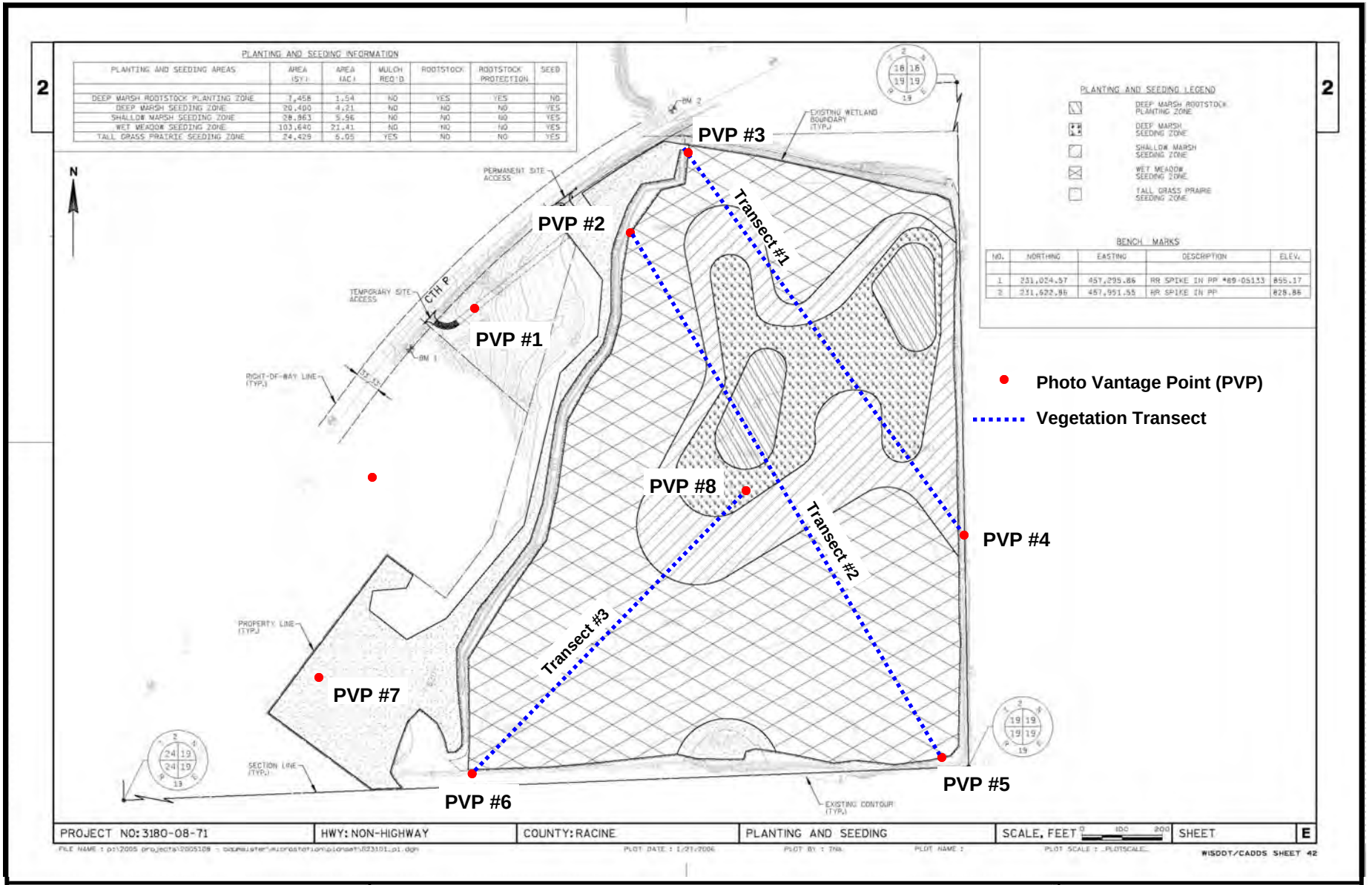


TN & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 3: VEGETATION PLANTING ZONES

FILE NAME: FIGURE_05.DWG



T N & Associates, Inc.
Engineering and Science

CITY OF BURLINGTON BYPASS
WETLAND MITIGATION - BAUMEISTER FARM
PROJECT ID 3180-08-01/3180-08-71

FIGURE 4:
PHOTO VANTAGE POINTS AND VEGETATON TRANSECT LOCATIONS

FILE NAME: FIGURE_05.DWG

Figure 5a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Wetland Indicator Status (2007-2011)

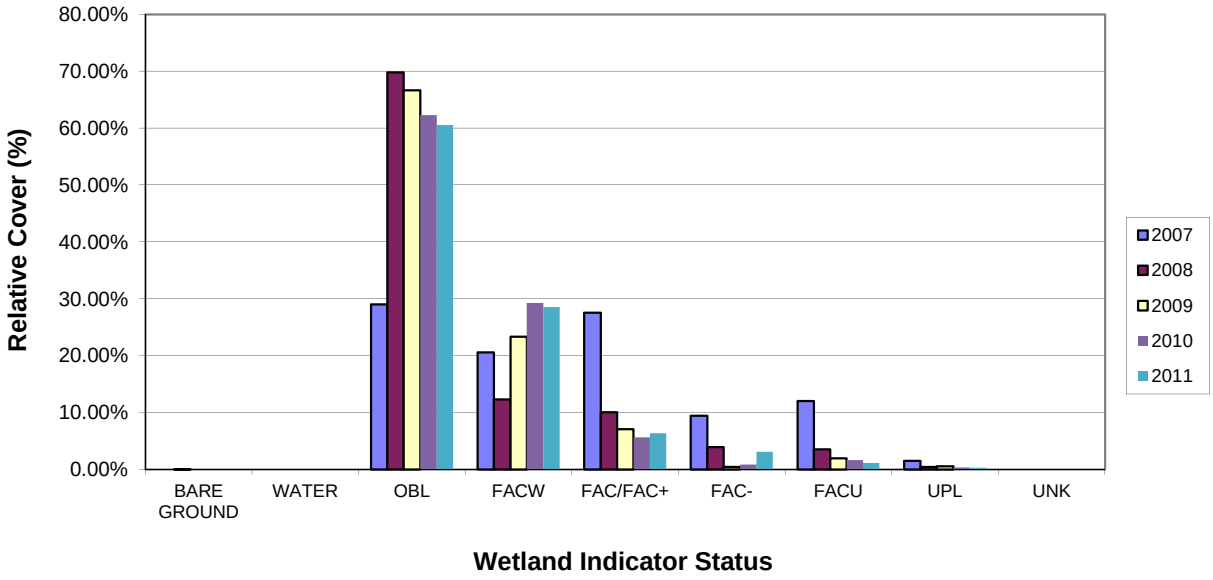


Figure 5b: Vegetation Comparison of the Baumeister Wetland Mitigaiton Site
Relative Frequency vs. Wetland Indicator Status (2007-2011)

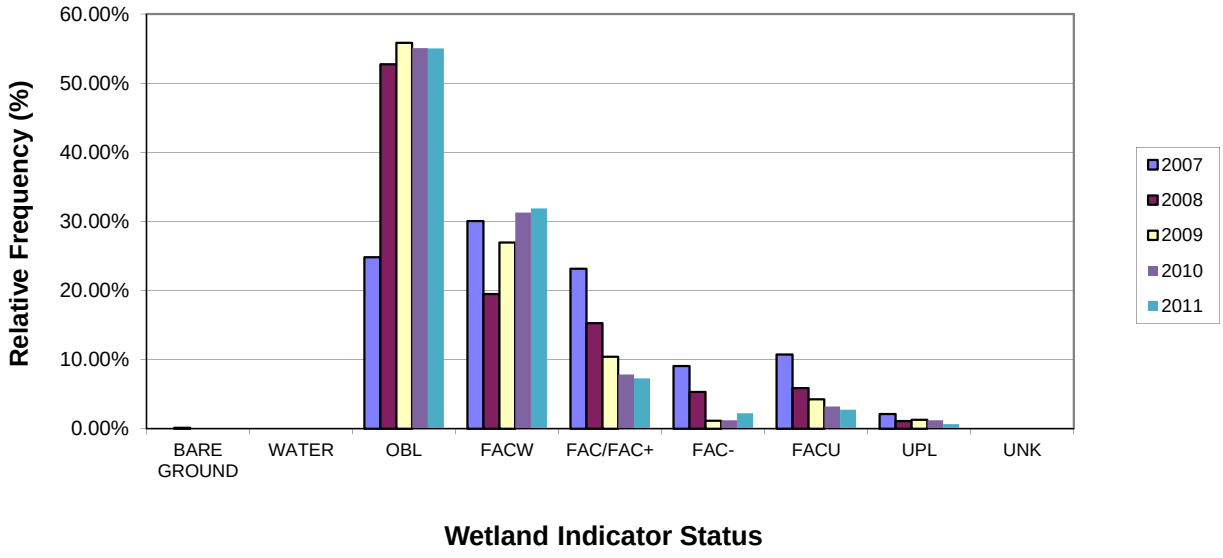


Figure 6a: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Cover vs. Origin (2007-2011)

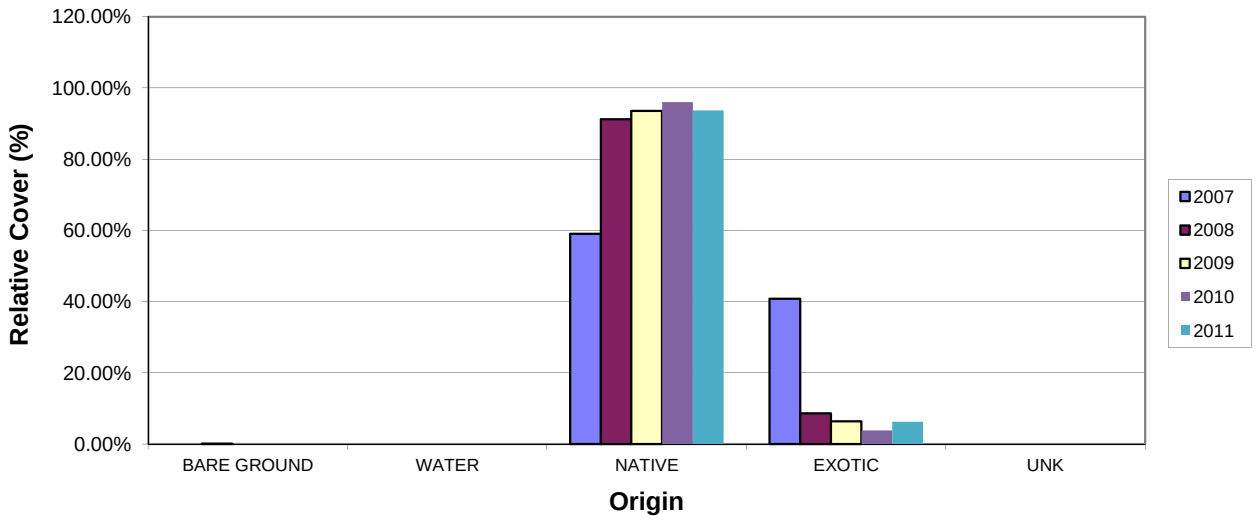


Figure 6b: Vegetation Comparison of the Baumeister Wetland Mitigation Site
Relative Frequency vs. Origin (2007-2011)

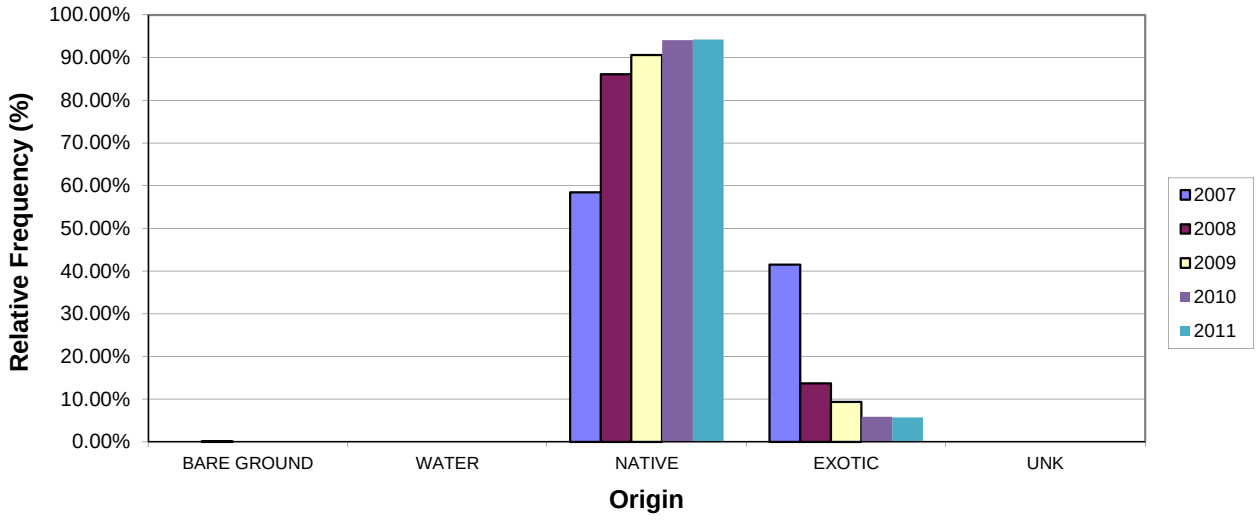


Figure 7: Photographic Log-Baumeister Wetland Mitigation Site

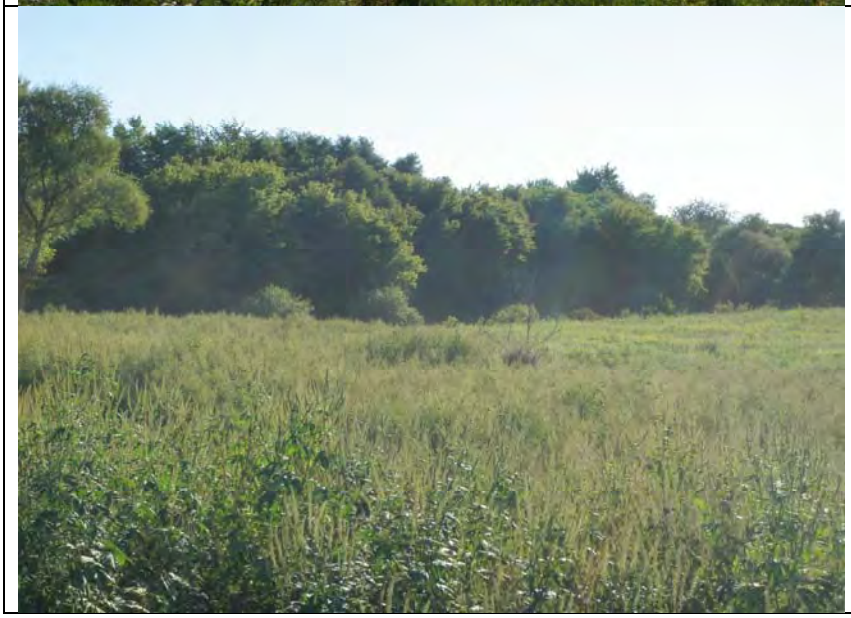
	8/25/2011; PVP#1 facing east.
	8/24/2010; PVP#2 facing east.
	8/25/2011; PVP#1 facing north.

Figure 7: Photographic Log-Baumeister Wetland Mitigation Site

	8/24/2010; PVP#3 facing southeast.
	8/24/2010; PVP#3 facing south.
	8/25/2011; PVP#3 facing north.

Figure 7: Photographic Log-Baumeister Wetland Mitigation Site

	8/24/2010; PVP#4 facing north.
	8/24/2010; PVP#5 facing north.
	8/24/2010; PVP#6 facing north.

Figure 7: Photographic Log-Baumeister Wetland Mitigation Site

	8/24/2010; PVP#7 facing southeast.
	8/24/2010; PVP#8 facing south.
	9/15/2011; wet meadow area in near transect #3 dominated by woolgrass.

EXHIBIT 1:
United States Army Corps of Engineers Correspondence

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

COPY

June 8, 2006

REPLY TO
Operations
Regulatory (2006-2807-DJP)

Ms. Barbara Eisenberg
T N & A Associates, Inc.
1033 N. Mayfair Road, Suite 200
Milwaukee, Wisconsin 53226

Dear Mr. Eisenberg:

This is in response to your May 24, 2006, letter requesting Corps concurrence with the compensatory mitigation proposed for the City of Burlington, STH 11 Bypass (WisDOT Project I.D. 3180-08-71). The compensatory mitigation site, also known as Baumeister Farm, is located in the NW ¼, Sec. 19, T. 2N., R. 19E., Racine County, Wisconsin.

We have reviewed the final plans and special provisions provided with your May 24, 2006, letter. The project is designed to retain 3.4 acres of existing wetlands, retain 3.91 acres of existing upland, restore 5.05 acres of upland to tall grass prairie, and to restore approximately 33.12 acres of wetlands within tiled crop land. The project would include the disablement of the existing sub-surface drain tile network and the planting and seeding of the wetland and upland prairie restoration areas. The project is expected to restore 5.65 acres of deep marsh, 5.96 acres of shallow marsh, 21.41 acres or wet meadow, and 5.05 acres of tall grass upland prairie. The initial site preparation would be followed by 5-years of comprehensive monitoring and management to insure that the project's goals, objectives, and success criteria are met. The actual wetland credits available at the site are subject to the results of vegetative survey that would be conducted in the final phase of monitoring that would establish a more precise determination of the types of wetlands actually restored at the site

Based on the information provided, we concur that the "Baumeister Farm" wetland mitigation project would provide wetland restoration that would be adequate to provide compensation mitigation for the unavoidable wetland impacts associated with the Burlington Bypass project.

The decision regarding this action is based on information found in the administrative record, which documents the District's decision-making process, the basis for the decision, and the final decision.

RECEIVED
REGULATORY BRANCH
WAUKESHA

COPY

If you have any questions, contact Dale Pfeiffle in our Waukesha office at (262) 547-0868. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely

Robert J. Whiting
Chief, Regulatory Branch

Copy furnished:

Joanne Kline
Wisconsin Department of Natural Resources
2300 North Dr. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

Karla Leithoff
Wisconsin Department of Transportation
District 2
P.O. Box 798
Waukesha, Wisconsin 53187-0798

EXHIBIT 2:
Construction Plans
for the
Baumeister Wetland Mitigation Site

PROJECT ID: 3180-08-71
WITH:

COUNTY: RACINE

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
Section No.	3	Estimate of Quantities
Section No.	3	Miscellaneous Quantities
Section No.	4	Right of Way Plat
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
Section No.	7	Sign Plates
Section No.	8	Structure Plans
Section No.	9	Computer Earthwork Data
Section No.	9	Cross Sections

TOTAL SHEETS =

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

CITY OF BURLINGTON BYPASS

(WETLAND MITIGATION - BAUMEISTER FARM)

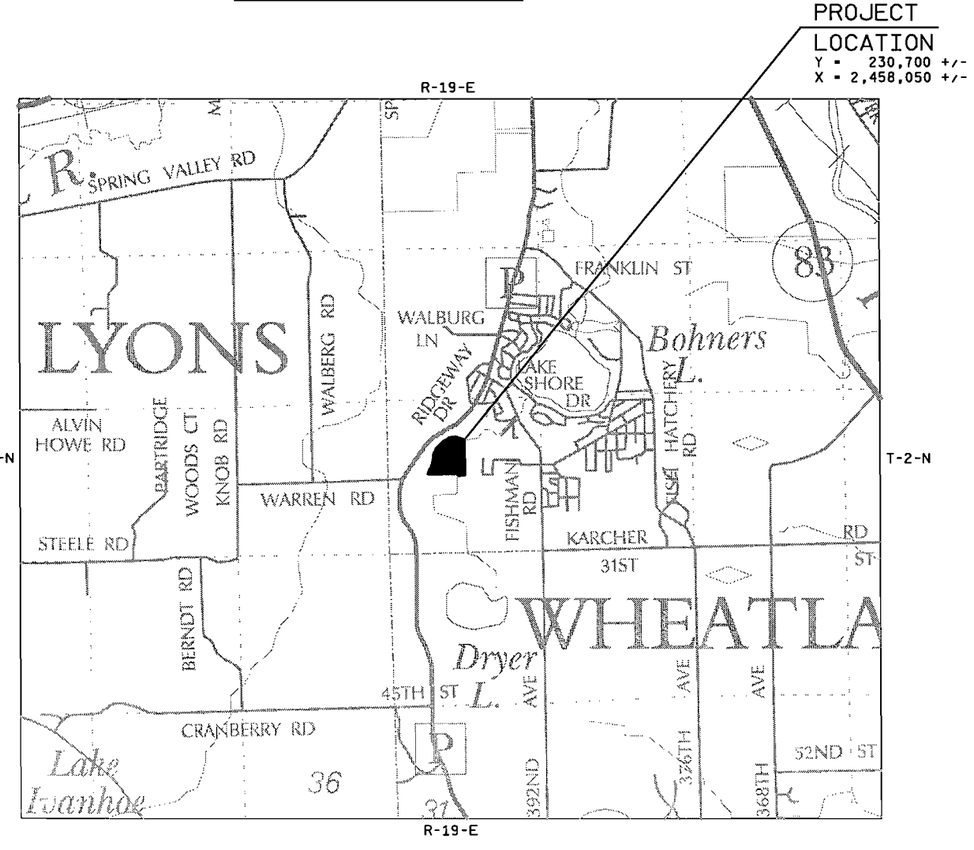
NON-HIGHWAY
RACINE COUNTY

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
3180-08-71		

STATE PROJECT NUMBER
3180-08-71



N



LAYOUT
SCALE 0 ½ MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

All coordinates on this plan are ground coordinates, (unless noted X, Y for grid) based on the Wisconsin State Plane Coordinate system (WSPCS) NAD 27 South Zone. To convert ground coordinates (N, E) to Grid Coordinates (Y, X), multiply ground coordinate by a combination factor of 0.99998531 and add 2,000,000 to the X coordinate.

Elevations shown on this plan are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

DESIGN DESIGNATION

A.D.T.	=	N/A
A.D.T.	=	N/A
D.H.V.	=	N/A
D.D.	=	N/A
T.	=	N/A
DESIGN SPEED	=	N/A
ESALS	=	N/A

CONVENTIONAL SYMBOLS

PLAN
- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE
- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

UTILITIES
- ELECTRIC (E)
- FIBER OPTIC (FO)
- GAS (G)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

ORIGINAL PLANS PREPARED BY

TN & A — TN & Associates, Inc. Engineering and Science

WISCONSIN — JASON R. MATSON — 37111 — WAUKESHA, WI — PROFESSIONAL ENGINEER

01/30/2006 (Date) (Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	WISDOT
Designer	TN & ASSOCIATES
Project Manager	A. SMIEJA
District Examiner	K. LEITHOFF
District Supervisor	D. SKORY
C.O. Examiner	

APPROVED FOR DISTRICT OFFICE

DATE: 1/30/06 Andrew J. Smieja (Signature)

E

2

GENERAL NOTES

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS, EXCEPT FOR PLANTING ZONES ARE TO BE SEEDED AND MULCHED IMMEDIATELY FOLLOWING COMPLETION OF WORK ACTIVITIES.

TEMPORARY STORAGE OF EQUIPMENT AND MATERIALS IN EXISTING WETLANDS IS NOT PERMITTED UNLESS AUTHORIZED BY THE ENGINEER.

ACCESS TO THE SITE IS PERMITTED ONLY AT THE SITE ACCESS POINTS SHOWN ON THE PLANS. EXACT LOCATION OF THE SITE ACCESS POINTS TO BE DETERMINED BY THE ENGINEER IN THE FIELD. THE SOUTHWESTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE TEMPORARY AND THE NORTHEASTERLY SITE ACCESS POINT OFF OF CTH P IS TO BE PERMANENT.

UTILITIES EXIST ADJACENT TO THE PROJECT AND MAY BE AFFECTED BY THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING DIGGERS HOTLINE AND ANY UTILITIES IN THE AREA THAT ARE NOT A MEMBER OF DIGGERS HOTLINE.

ALL EROSION CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND ARE TO BE INSTALLED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.

OTHER AGENCIES

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FAX: (262) 763-2118
ASTREIF@TOWNOFBURLINGTON.COM

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PO BOX 47
WAUKESHA, WI 53187 0047
PHONE: (262) 506-6864
FAX: (262) 506-6711
AEBERHARDT@ATCLLC.COM

* MEMBER OF DIGGERS HOTLINE

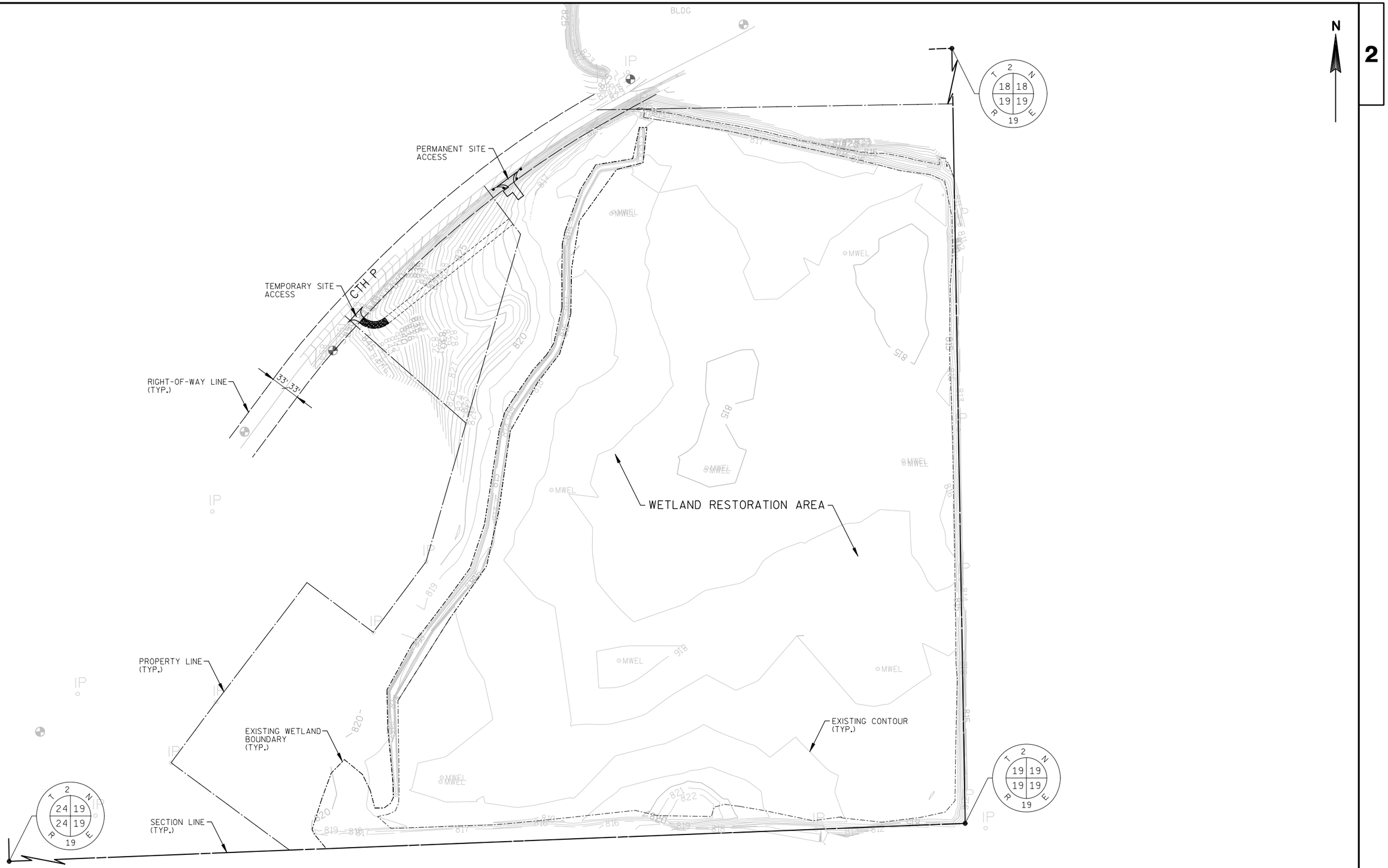
STANDARD DETAIL DRAWINGS

8E9-6	SILT FENCE
14B15-4a	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-4b	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B18-4a	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
15D29-1	TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD

DIGGERS HOTLINE

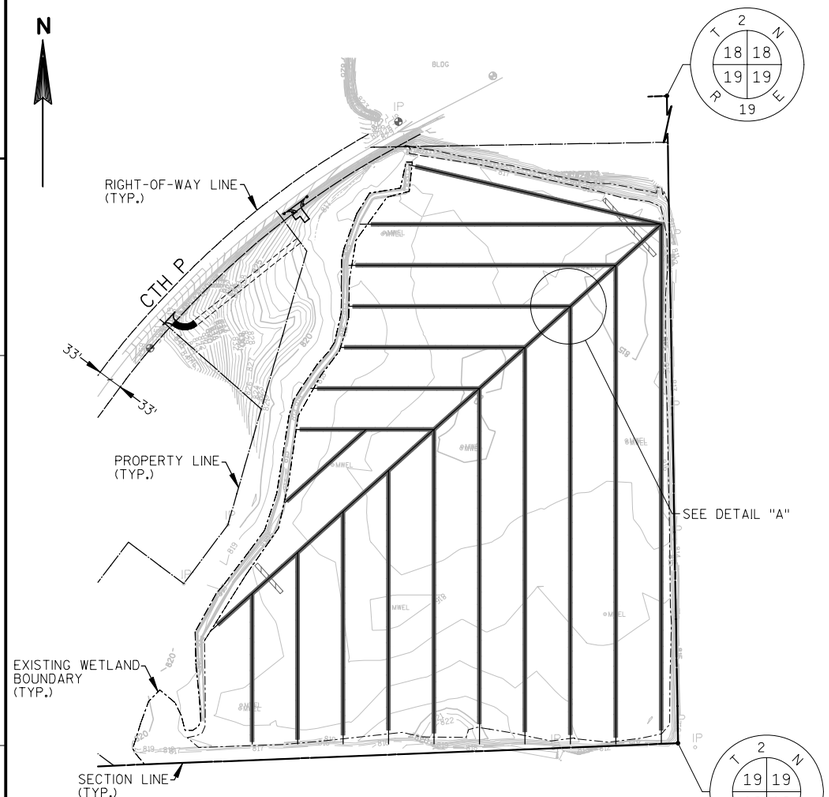
Toll Free (800) 242-8511
Milwaukee Area (414) 259-1181
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	GENERAL NOTES	SHEET	E

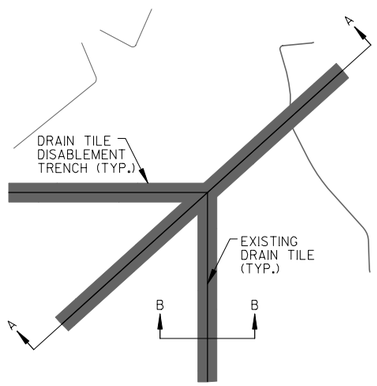


PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PROJECT OVERVIEW	SCALE, FEET 0 100 200	SHEET E

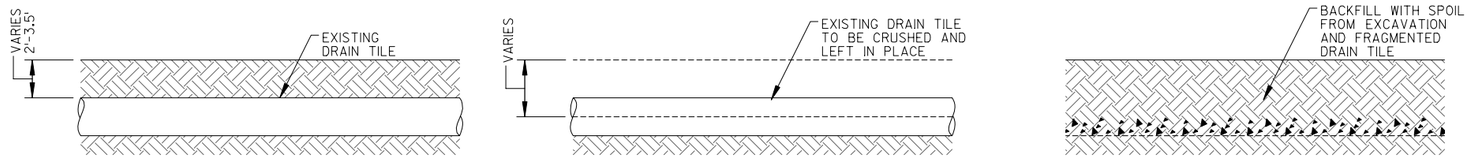
FILE NAME : p:\2005 projects\2005108 - baumeister\microstation\planset\020201_po.dgn PLOT DATE : 1/27/2006 PLOT BY : TNA PLOT NAME : PLOT SCALE : _PLOTSCALE_



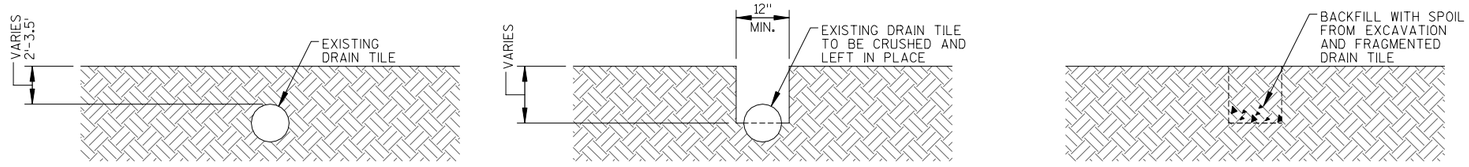
PLAN VIEW



DETAIL "A"



SECTION A-A



SECTION B-B

NOTES;

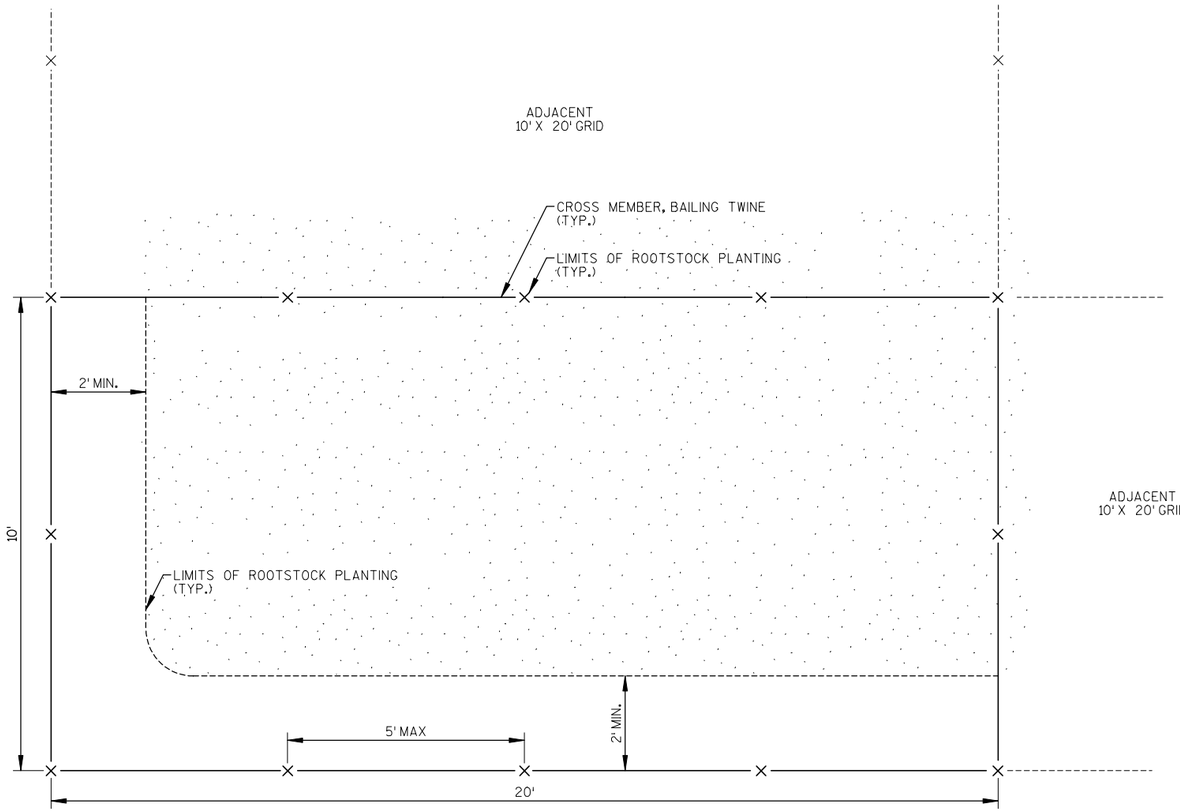
1. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
2. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
3. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
4. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
5. SEE DRAIN TILE DISABLEMENT PLAN SHEET FOR ADDITIONAL INFORMATION.

DRAIN TILE DISABLEMENT DETAIL

N.T.S.

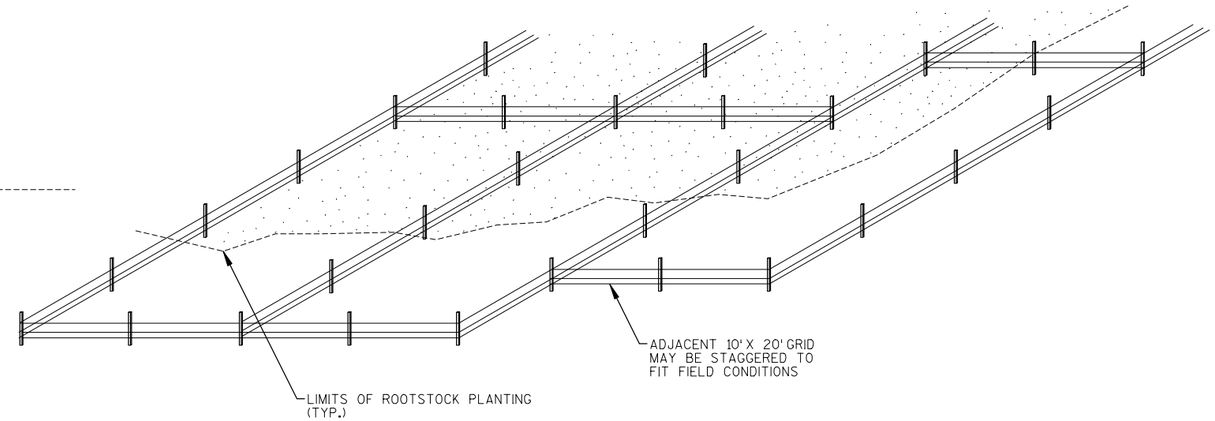
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

2

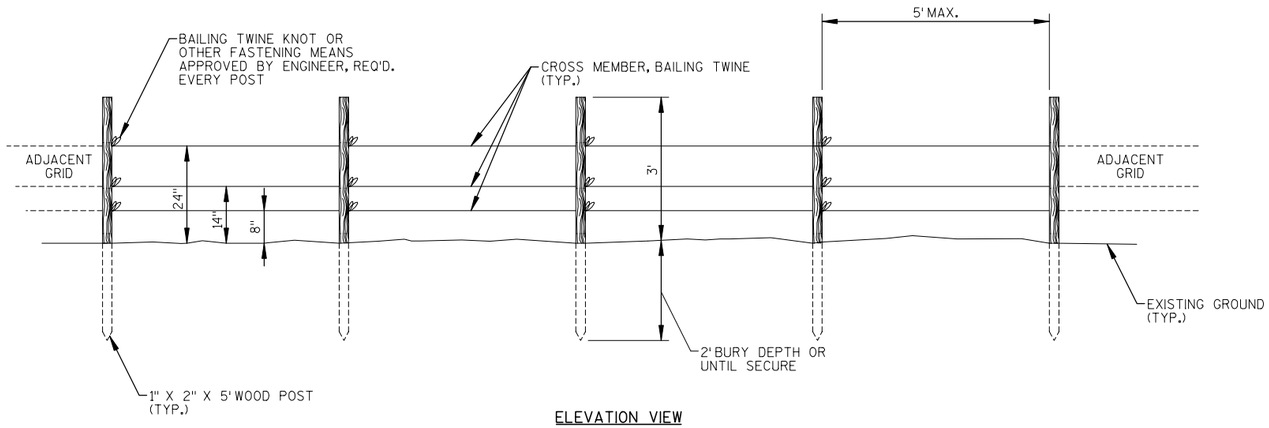


PLAN VIEW

ADJACENT
10' X 20' GRID



ISOMETRIC VIEW

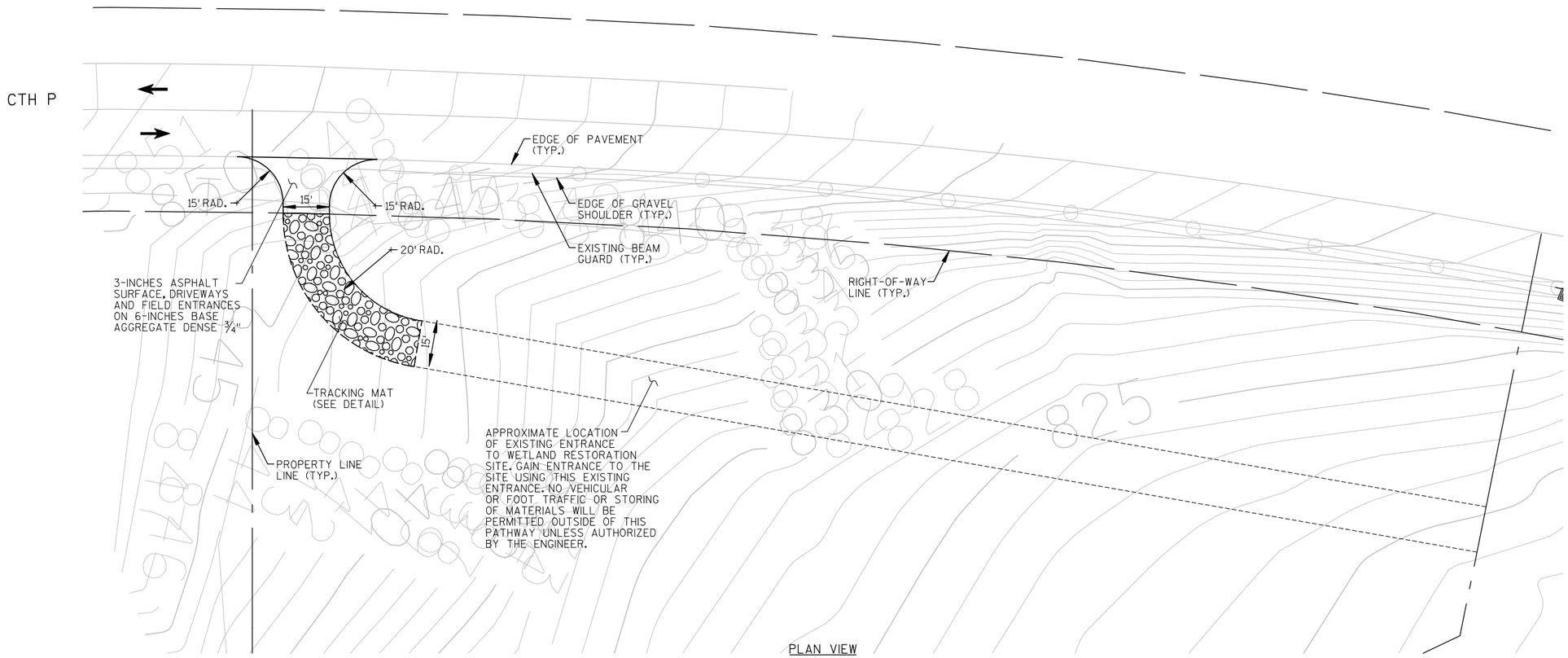


ELEVATION VIEW

ROOTSTOCK PROTECTION DETAIL

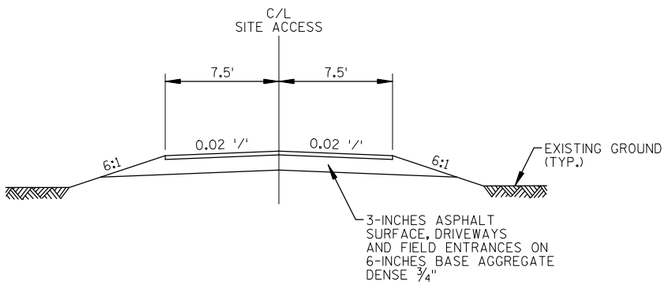
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

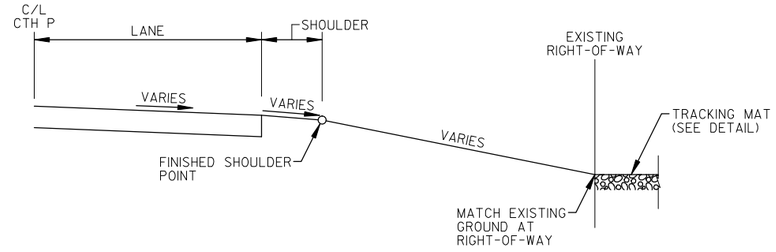


PLAN VIEW

NOTE: ALL TOPSOIL STRIPPED TO CONSTRUCT THE TEMPORARY SITE ACCESS POINT AND TRACKING PAD IS TO BE PLACED IN A NEAT PILE ON SITE WITH THE PROJECT MANAGER'S APPROVAL. THE PILE SHOULD BE NEAR THE ENTRANCE FOR THE TEMPORARY SITE ACCESS POINT AND WILL BE REMOVED BY OTHERS.



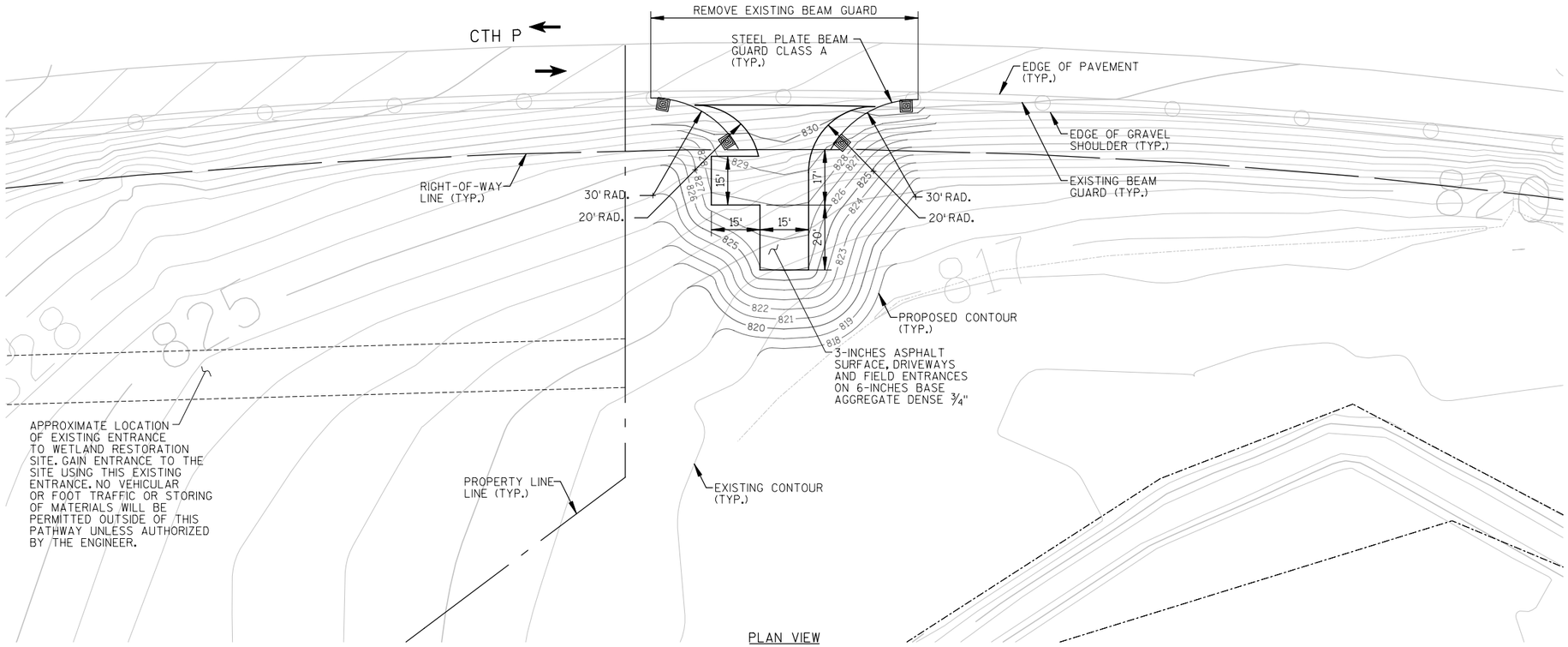
INSIDE RIGHT-OF-WAY CROSS SECTION



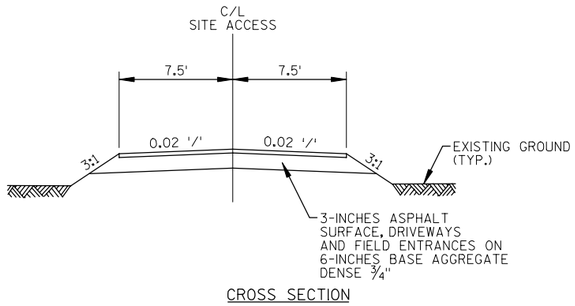
PROFILE

TEMPORARY SITE ACCESS POINT
CTH P
N.T.S.

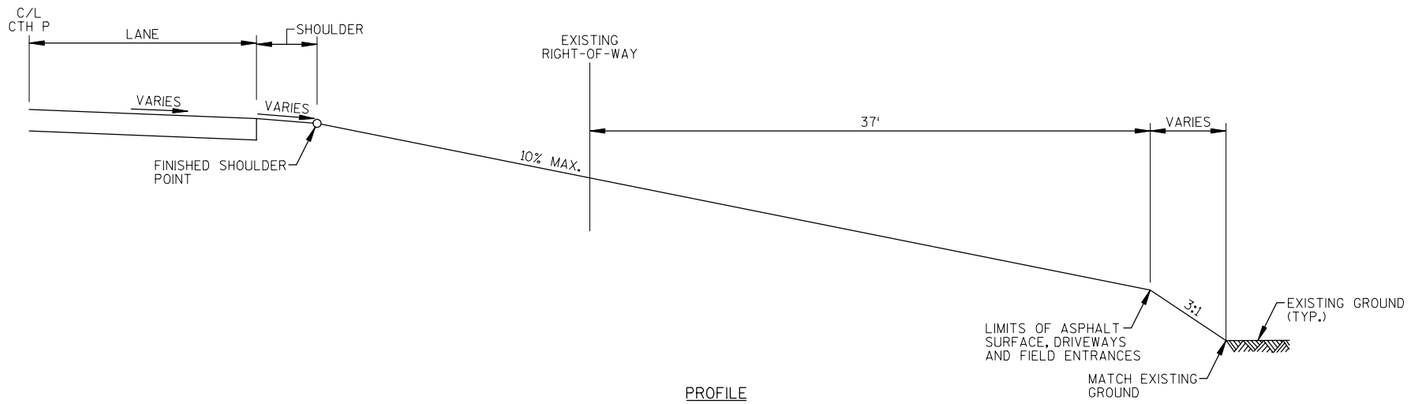
PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



PLAN VIEW



CROSS SECTION

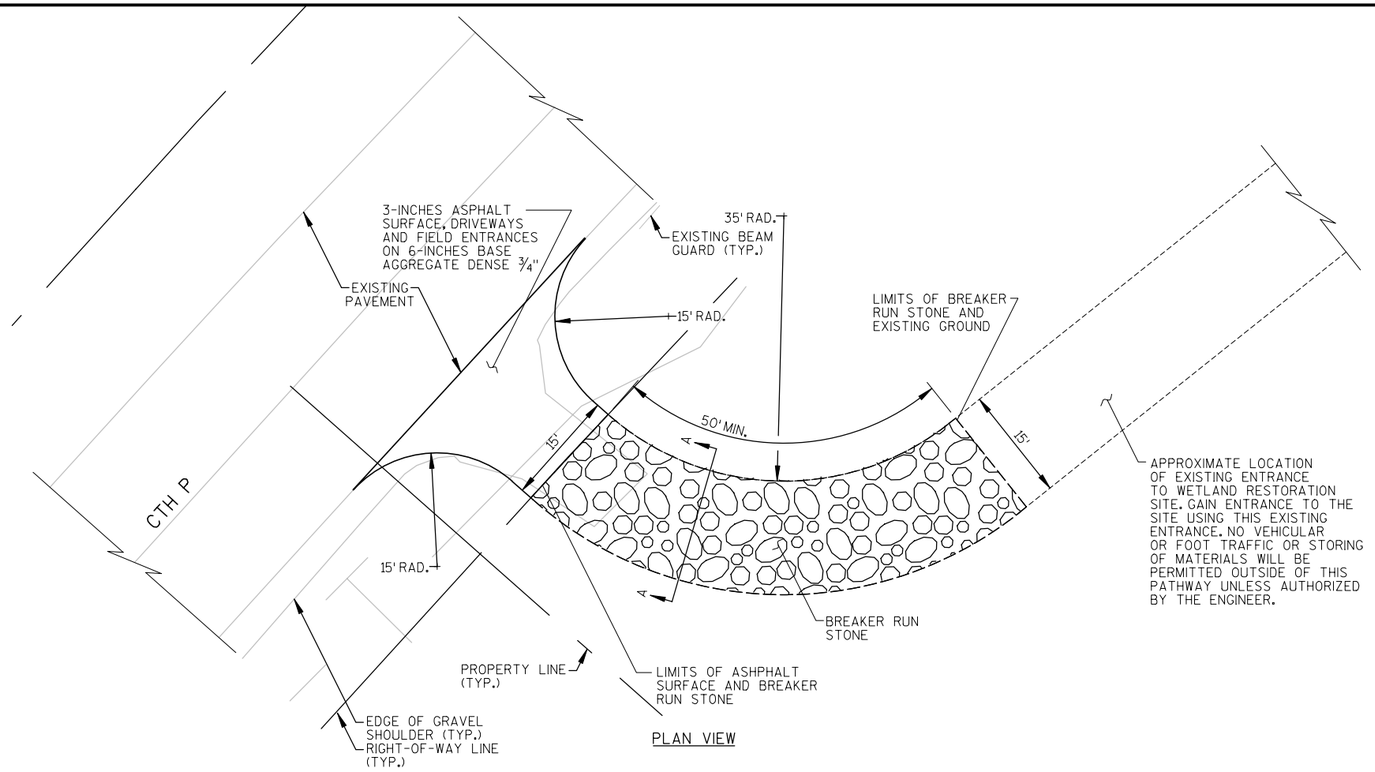


PROFILE

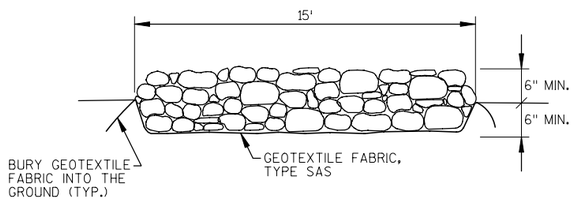
PERMANENT SITE ACCESS POINT
CTH P
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E

2



PLAN VIEW



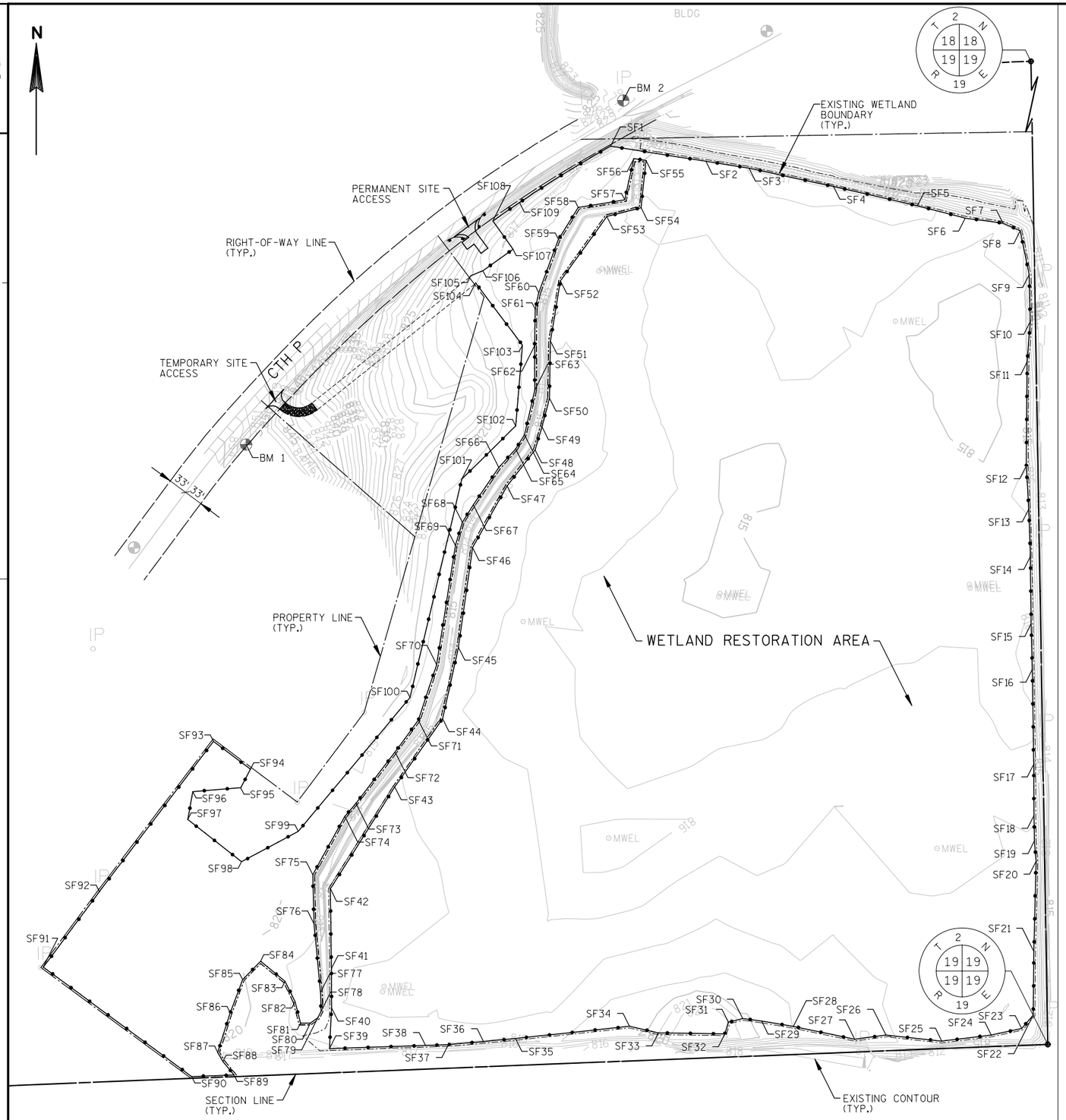
NOTE: TRACKING MATS SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

TRACKING MAT TO REMAIN IN PLACE AFTER CONSTRUCTION IS COMPLETED.

SECTION A-A

TRACKING MAT
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	CONSTRUCTION DETAILS	SHEET	E



EROSION CONTROL LEGEND

SILT FENCE

BENCH MARKS

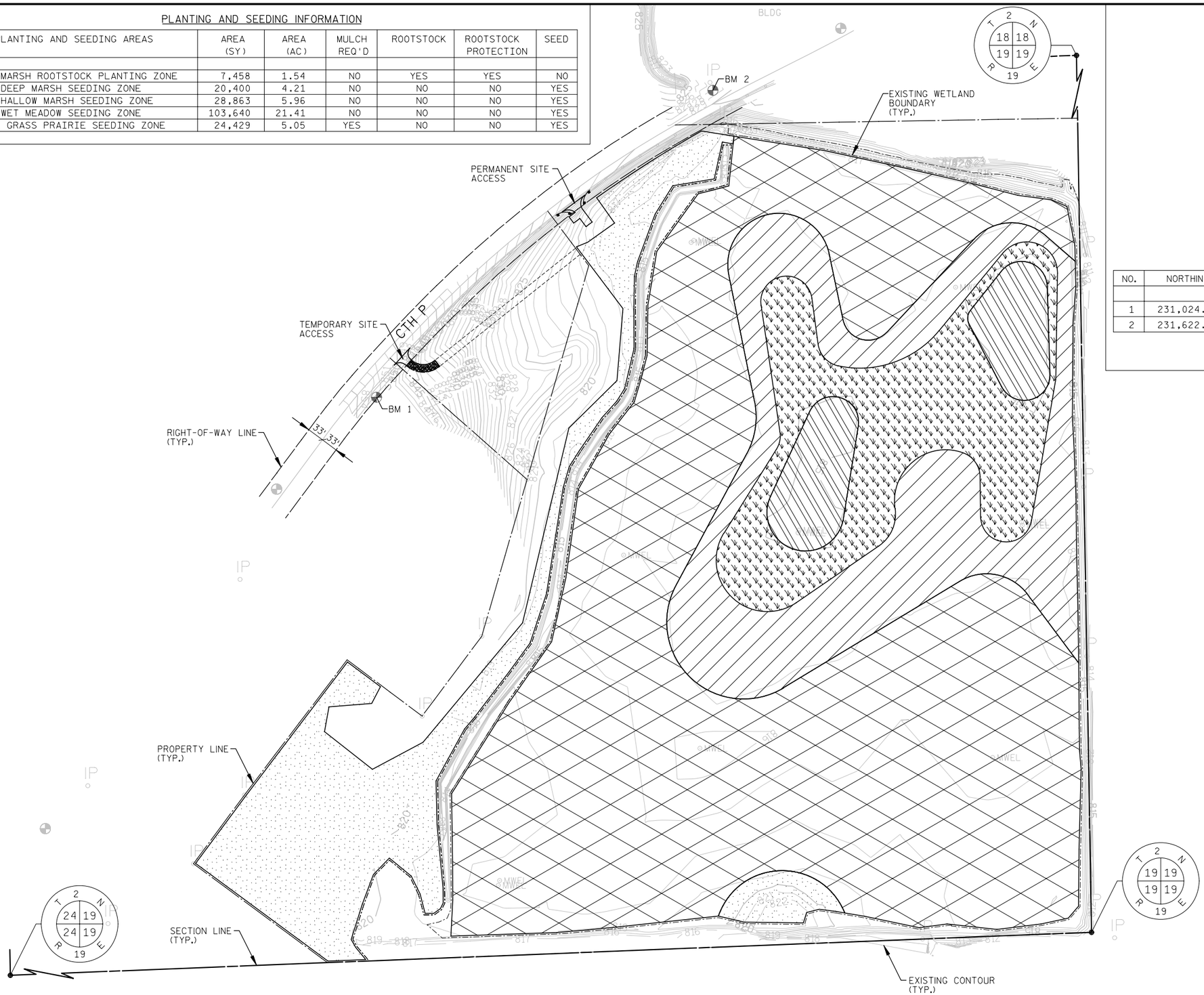
NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

SILT FENCE COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING	POINT NUMBER	NORTHING	EASTING
SF1	231,543.42	457,929.44	SF59	231,381.35	457,838.84
SF2	231,517.12	458,095.08	SF60	231,288.57	457,804.69
SF3	231,505.21	458,170.12	SF61	231,259.99	457,798.50
SF4	231,473.33	458,316.97	SF62	231,196.88	457,797.43
SF5	231,439.93	458,463.06	SF63	231,119.74	457,797.78
SF6	231,418.22	458,545.91	SF64	231,041.68	457,779.73
SF7	231,409.59	458,611.65	SF65	231,017.11	457,764.40
SF8	231,396.58	458,641.64	SF66	230,984.60	457,735.12
SF9	231,319.99	458,657.24	SF67	230,920.17	457,690.98
SF10	231,238.72	458,659.15	SF68	230,889.45	457,671.72
SF11	231,168.35	458,653.66	SF69	230,849.16	457,659.75
SF12	230,987.72	458,652.26	SF70	230,642.16	457,627.10
SF13	230,912.85	458,656.46	SF71	230,545.65	457,595.34
SF14	230,829.93	458,659.30	SF72	230,490.31	457,554.80
SF15	230,713.49	458,660.70	SF73	230,401.05	457,486.87
SF16	230,634.05	458,662.68	SF74	230,378.34	457,467.42
SF17	230,469.27	458,665.13	SF75	230,276.87	457,411.75
SF18	230,380.06	458,665.61	SF76	230,191.55	457,413.98
SF19	230,336.08	458,666.38	SF77	230,068.71	457,425.55
SF20	230,300.15	458,669.26	SF78	230,039.41	457,426.02
SF21	230,143.63	458,665.43	SF79	230,028.36	457,420.49
SF22	230,032.89	458,664.32	SF80	230,018.92	457,407.66
SF23	230,009.64	458,644.20	SF81	230,019.03	457,390.48
SF24	229,998.17	458,591.35	SF82	230,056.42	457,380.83
SF25	229,987.72	458,505.33	SF83	230,091.61	457,363.64
SF26	229,998.12	458,408.31	SF84	230,126.68	457,321.02
SF27	229,990.96	458,353.95	SF85	230,094.53	457,289.72
SF28	230,013.28	458,247.24	SF86	230,036.89	457,268.27
SF29	230,022.41	458,192.14	SF87	229,968.03	457,246.60
SF30	230,027.01	458,159.10	SF88	229,952.07	457,255.58
SF31	230,020.41	458,134.35	SF89	229,928.86	457,274.95
SF32	230,000.37	458,128.08	SF90	229,925.94	457,201.35
SF33	230,002.05	458,012.42	SF91	230,116.29	456,943.25
SF34	230,013.49	457,962.30	SF92	230,247.76	457,040.85
SF35	229,992.26	457,764.14	SF93	230,508.77	457,239.18
SF36	229,986.93	457,708.56	SF94	230,460.49	457,303.48
SF37	229,981.69	457,647.41	SF95	230,428.09	457,286.55
SF38	229,980.30	457,607.74	SF96	230,421.34	457,203.25
SF39	229,974.49	457,440.80	SF97	230,372.96	457,194.55
SF40	230,045.10	457,444.56	SF98	230,299.46	457,287.84
SF41	230,113.97	457,444.18	SF99	230,352.29	457,386.54
SF42	230,253.11	457,442.15	SF100	230,584.88	457,580.73
SF43	230,429.51	457,554.29	SF101	230,964.62	457,671.02
SF44	230,548.16	457,637.40	SF102	231,057.15	457,764.62
SF45	230,672.43	457,664.99	SF103	231,197.57	457,776.26
SF46	230,845.54	457,689.57	SF104	231,305.75	457,694.75
SF47	230,952.73	457,749.60	SF105	231,317.74	457,685.71
SF48	231,015.50	457,798.28	SF106	231,326.80	457,707.45
SF49	231,055.57	457,810.30	SF107	231,364.19	457,759.93
SF50	231,105.34	457,823.26	SF108	231,413.31	457,724.94
SF51	231,204.65	457,824.96	SF109	231,445.42	457,771.19
SF52	231,309.21	457,842.26			
SF53	231,421.13	457,922.98			
SF54	231,436.39	457,982.52			
SF55	231,518.44	457,991.10			
SF56	231,521.81	457,969.89			
SF57	231,449.97	457,954.15			
SF58	231,436.74	457,873.32			

PLANTING AND SEEDING INFORMATION

PLANTING AND SEEDING AREAS	AREA (SY)	AREA (AC)	MULCH REQ'D	ROOTSTOCK	ROOTSTOCK PROTECTION	SEED
DEEP MARSH ROOTSTOCK PLANTING ZONE	7,458	1.54	NO	YES	YES	NO
DEEP MARSH SEEDING ZONE	20,400	4.21	NO	NO	NO	YES
SHALLOW MARSH SEEDING ZONE	28,863	5.96	NO	NO	NO	YES
WET MEADOW SEEDING ZONE	103,640	21.41	NO	NO	NO	YES
TALL GRASS PRAIRIE SEEDING ZONE	24,429	5.05	YES	NO	NO	YES



PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

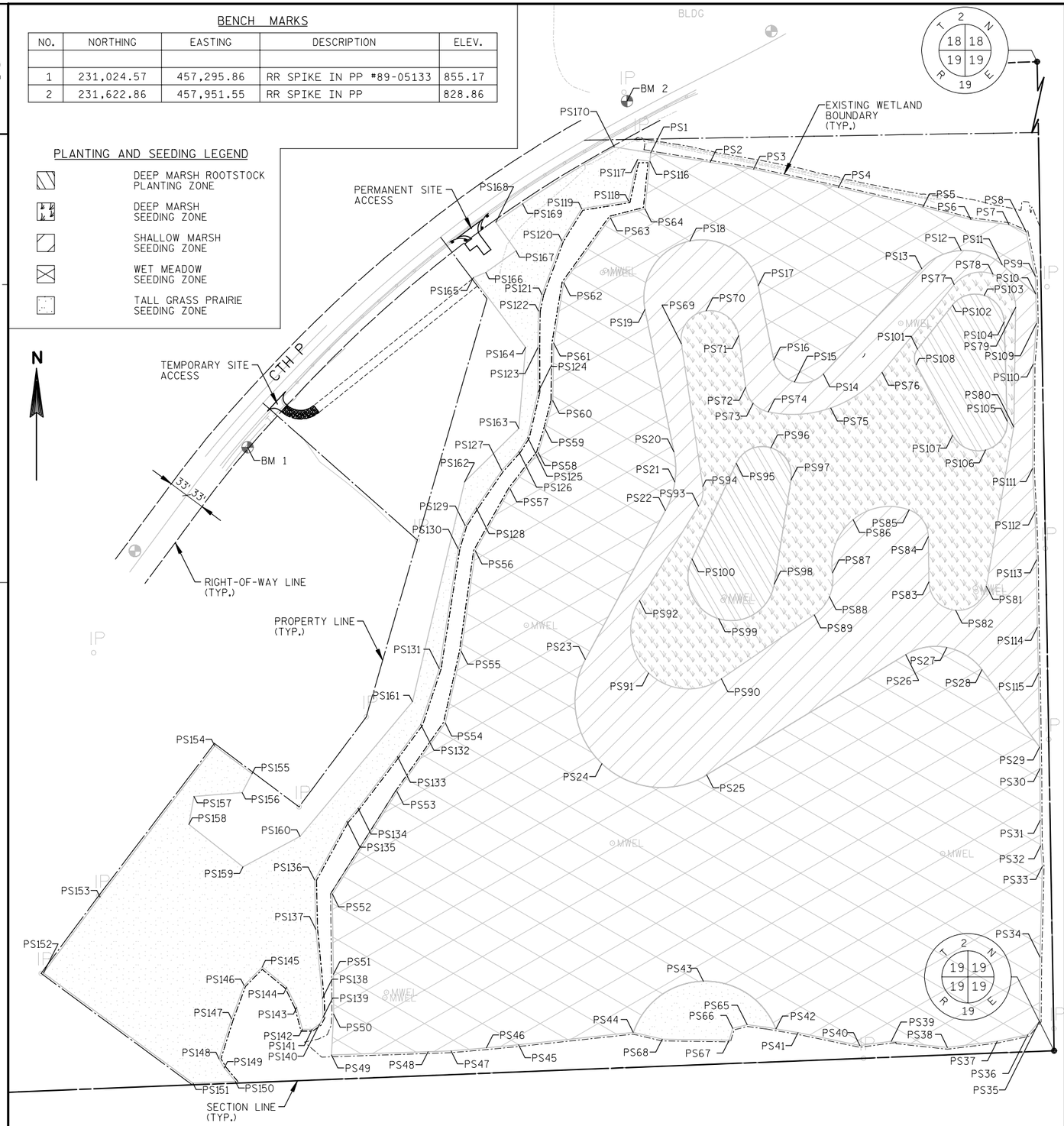
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BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PLANTING AND SEEDING LEGEND

- DEEP MARSH ROOTSTOCK PLANTING ZONE
- DEEP MARSH SEEDING ZONE
- SHALLOW MARSH SEEDING ZONE
- WET MEADOW SEEDING ZONE
- TALL GRASS PRAIRIE SEEDING ZONE

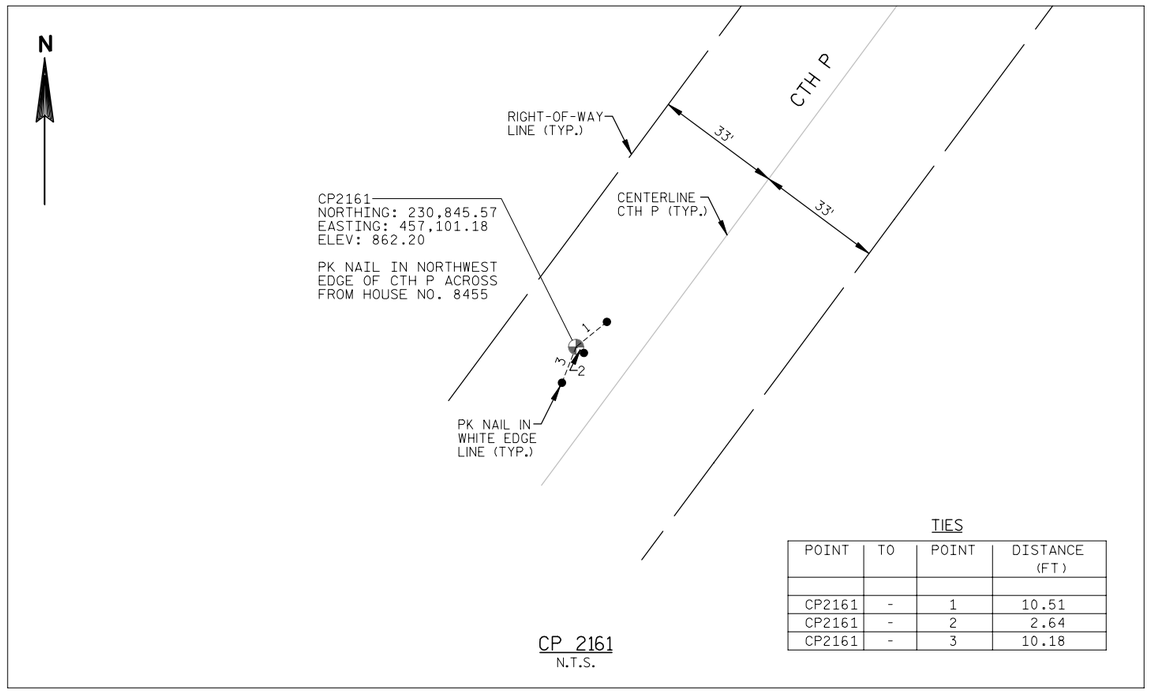


PLANTING AND SEEDING COORDINATE TABLE

POINT NUMBER	NORTHING	EASTING	POINT NUMBER	NORTHING	EASTING
PS1	231,533.38	457,992.66	PS86	230,899.66	458,342.10
PS2	231,517.12	458,095.08	PS87	230,807.67	458,306.66
PS3	231,505.21	458,170.12	PS88	230,766.85	458,301.31
PS4	231,473.33	458,316.97	PS89	230,735.00	458,275.22
PS5	231,439.93	458,463.06	PS90	230,624.51	458,114.67
PS6	231,418.22	458,545.91	PS91	230,634.59	457,988.90
PS7	231,409.59	458,611.65	PS92	230,759.77	457,973.11
PS8	231,396.58	458,641.64	PS93	230,923.00	458,075.36
PS9	231,319.99	458,657.24	PS94	230,956.95	458,082.44
PS10	231,289.40	458,657.96	PS95	230,997.03	458,140.36
PS11	231,340.06	458,599.81	PS96	231,023.77	458,200.39
PS12	231,364.64	458,528.92	PS97	230,967.94	458,235.06
PS13	231,333.00	458,460.89	PS98	230,787.99	458,205.89
PS14	231,151.42	458,290.85	PS99	230,728.40	458,109.87
PS15	231,137.46	458,240.81	PS100	230,831.60	458,063.81
PS16	231,175.46	458,205.39	PS101	231,193.95	458,453.74
PS17	231,303.66	458,178.31	PS102	231,270.54	458,514.14
PS18	231,380.89	458,060.08	PS103	231,287.06	458,569.10
PS19	231,262.89	457,982.51	PS104	231,241.02	458,603.38
PS20	231,016.60	458,032.72	PS105	231,069.80	458,608.77
PS21	230,964.60	458,034.18	PS106	231,019.97	458,571.36
PS22	230,915.22	458,017.79	PS107	231,045.30	458,514.43
PS23	230,657.99	457,879.45	PS108	231,167.05	458,451.13
PS24	230,478.01	457,908.13	PS109	231,238.72	458,659.15
PS25	230,458.56	458,089.34	PS110	231,168.35	458,653.66
PS26	230,666.25	458,433.20	PS111	230,987.72	458,652.26
PS27	230,678.78	458,504.15	PS112	230,912.85	458,656.46
PS28	230,640.37	458,565.11	PS113	230,829.93	458,659.30
PS29	230,506.77	458,664.57	PS114	230,713.49	458,660.70
PS30	230,469.27	458,665.13	PS115	230,634.05	458,662.68
PS31	230,380.06	458,665.61	PS116	231,518.44	457,991.10
PS32	230,336.08	458,666.38	PS117	231,521.81	457,969.89
PS33	230,300.15	458,669.26	PS118	231,449.97	457,954.15
PS34	230,143.63	458,665.43	PS119	231,436.74	457,873.32
PS35	230,032.89	458,664.32	PS120	231,381.35	457,838.84
PS36	230,009.64	458,644.20	PS121	231,288.57	457,804.69
PS37	229,998.17	458,591.35	PS122	231,259.99	457,798.50
PS38	229,987.72	458,505.33	PS123	231,196.88	457,797.43
PS39	229,998.12	458,408.31	PS124	231,119.74	457,797.78
PS40	229,990.96	458,353.95	PS125	231,041.68	457,779.73
PS41	230,013.28	458,247.24	PS126	231,017.11	457,764.40
PS42	230,019.63	458,208.90	PS127	230,984.60	457,735.12
PS43	230,102.06	458,083.47	PS128	230,920.17	457,690.98
PS44	230,013.49	457,962.30	PS129	230,889.45	457,671.72
PS45	229,992.26	457,764.14	PS130	230,849.16	457,659.75
PS46	229,986.93	457,708.56	PS131	230,642.16	457,627.10
PS47	229,981.69	457,647.41	PS132	230,545.65	457,595.34
PS48	229,980.30	457,607.74	PS133	230,490.31	457,554.80
PS49	229,974.49	457,440.80	PS134	230,401.05	457,486.87
PS50	230,045.10	457,444.56	PS135	230,378.34	457,467.42
PS51	230,113.97	457,444.18	PS136	230,276.87	457,411.75
PS52	230,253.11	457,442.15	PS137	230,191.55	457,413.98
PS53	230,429.51	457,554.29	PS138	230,068.71	457,425.55
PS54	230,548.16	457,637.40	PS139	230,039.41	457,426.02
PS55	230,672.43	457,664.99	PS140	230,028.36	457,420.49
PS56	230,845.54	457,689.57	PS141	230,018.91	457,407.66
PS57	230,952.73	457,749.60	PS142	230,019.03	457,390.48
PS58	231,015.50	457,798.28	PS143	230,056.42	457,380.83
PS59	231,055.57	457,810.30	PS144	230,091.61	457,363.64
PS60	231,105.34	457,823.26	PS145	230,126.68	457,321.02
PS61	231,204.65	457,824.96	PS146	230,094.53	457,289.72
PS62	231,309.21	457,842.26	PS147	230,036.89	457,268.27
PS63	231,421.13	457,922.98	PS148	229,968.03	457,246.60
PS64	231,436.39	457,982.52	PS149	229,952.07	457,255.58
PS65	230,027.01	458,159.10	PS150	229,928.86	457,274.95
PS66	230,020.41	458,134.35	PS151	229,925.94	457,201.35
PS67	230,000.37	458,128.08	PS152	230,116.29	456,943.25
PS68	230,002.05	458,012.42	PS153	230,247.76	457,040.85
PS69	231,203.36	458,045.55	PS154	230,508.77	457,239.18
PS70	231,260.26	458,087.95	PS155	230,460.49	457,303.48
PS71	231,217.46	458,144.55	PS156	230,428.09	457,286.55
PS72	231,127.99	458,156.65	PS157	230,421.34	457,203.25
PS73	231,100.76	458,169.48	PS158	230,372.96	457,194.55
PS74	231,085.82	458,195.62	PS159	230,299.46	457,287.84
PS75	231,092.38	458,303.61	PS160	230,352.29	457,386.54
PS76	231,154.21	458,392.39	PS161	230,584.88	457,580.73
PS77	231,305.77	458,517.10	PS162	230,964.62	457,671.02
PS78	231,323.78	458,584.10	PS163	231,057.15	457,764.62
PS79	231,266.53	458,623.30	PS164	231,197.57	457,776.26
PS80	231,059.59	458,619.94	PS165	231,317.74	457,685.71
PS81	230,784.46	458,572.68	PS166	231,326.80	457,707.45
PS82	230,742.87	458,519.50	PS167	231,364.19	457,759.93
PS83	230,792.16	458,473.37	PS168	231,413.31	457,724.94
PS84	230,869.93	458,472.39	PS169	231,445.42	457,771.19
PS85	230,916.56	458,439.22	PS170	231,543.42	457,929.44

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	PLANTING AND SEEDING	SCALE, FEET 0 100 200	SHEET	E

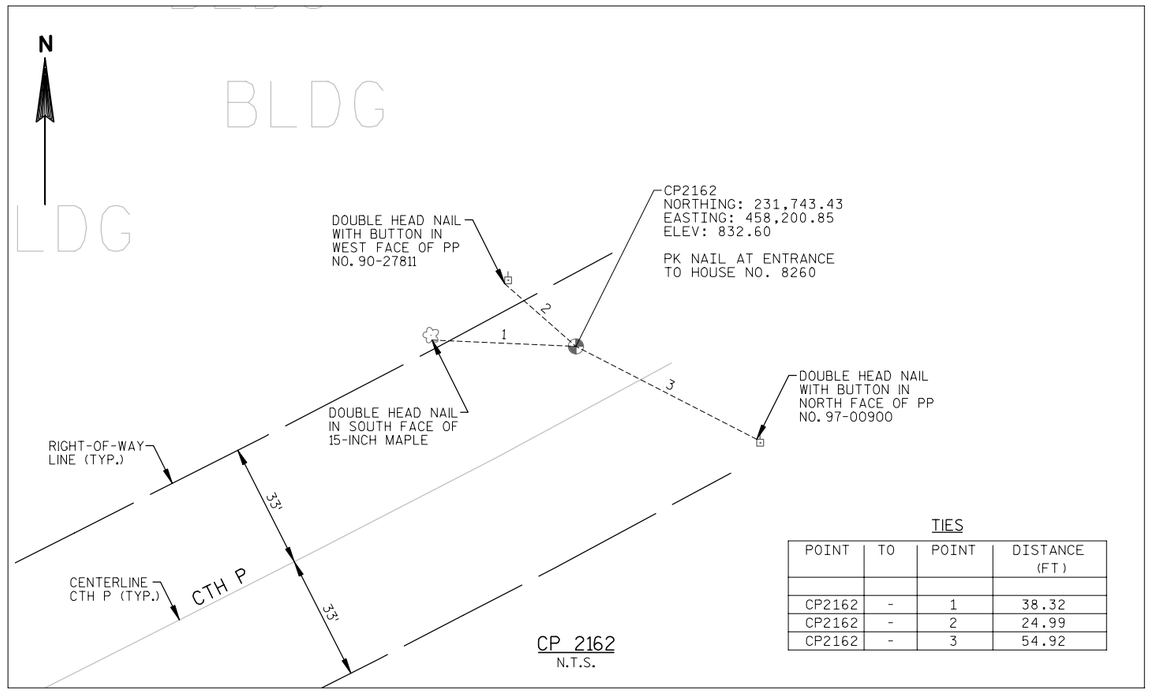
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TIES

POINT	TO	POINT	DISTANCE (FT)
CP2161	-	1	10.51
CP2161	-	2	2.64
CP2161	-	3	10.18

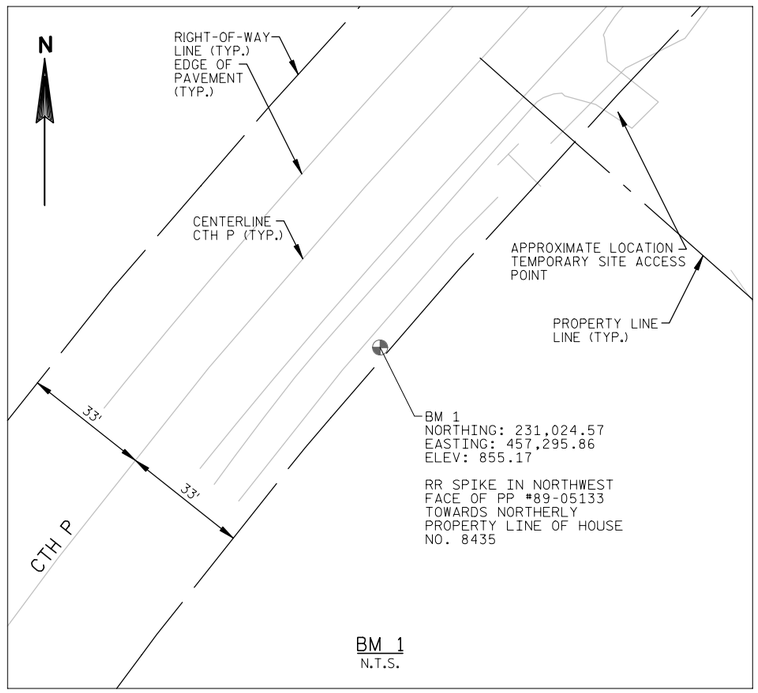
CP 2161
N.T.S.



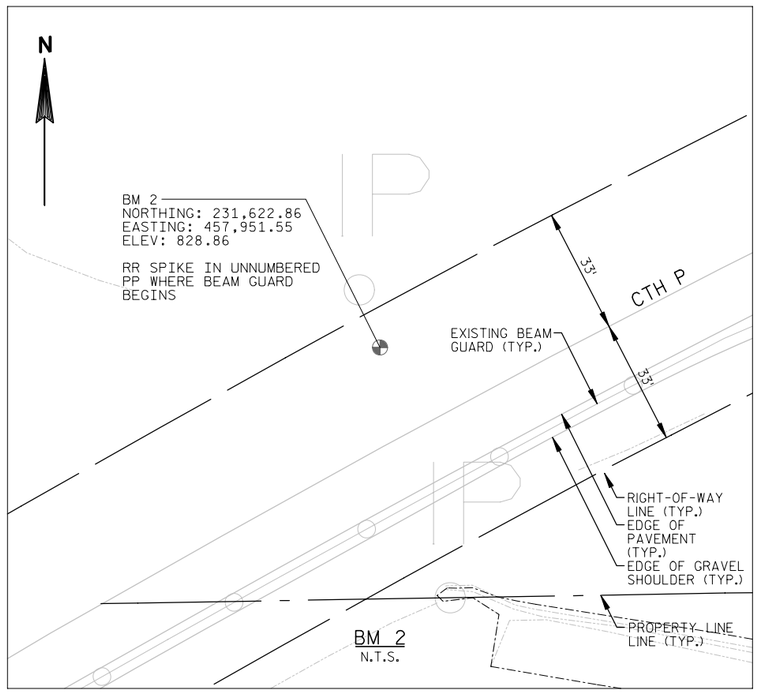
TIES

POINT	TO	POINT	DISTANCE (FT)
CP2162	-	1	38.32
CP2162	-	2	24.99
CP2162	-	3	54.92

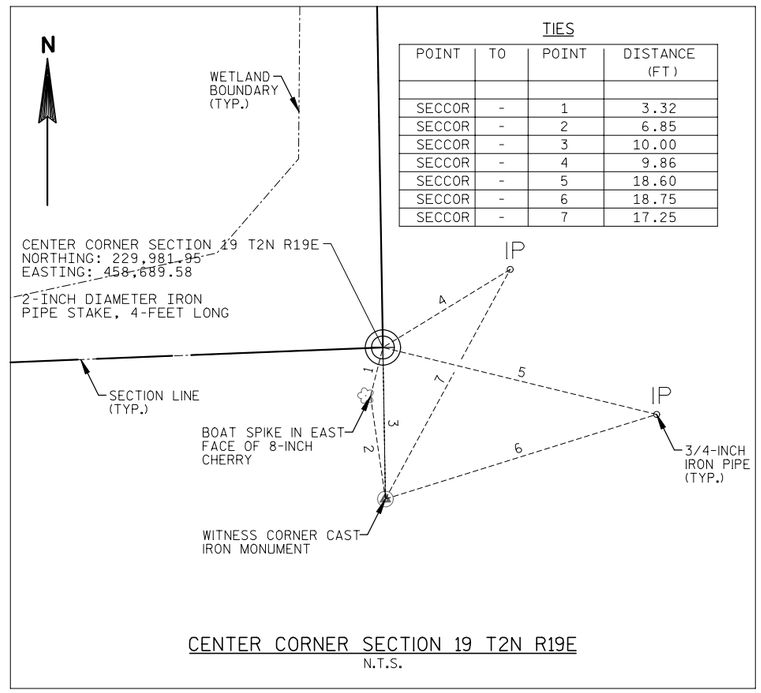
CP 2162
N.T.S.



BM 1
N.T.S.



BM 2
N.T.S.

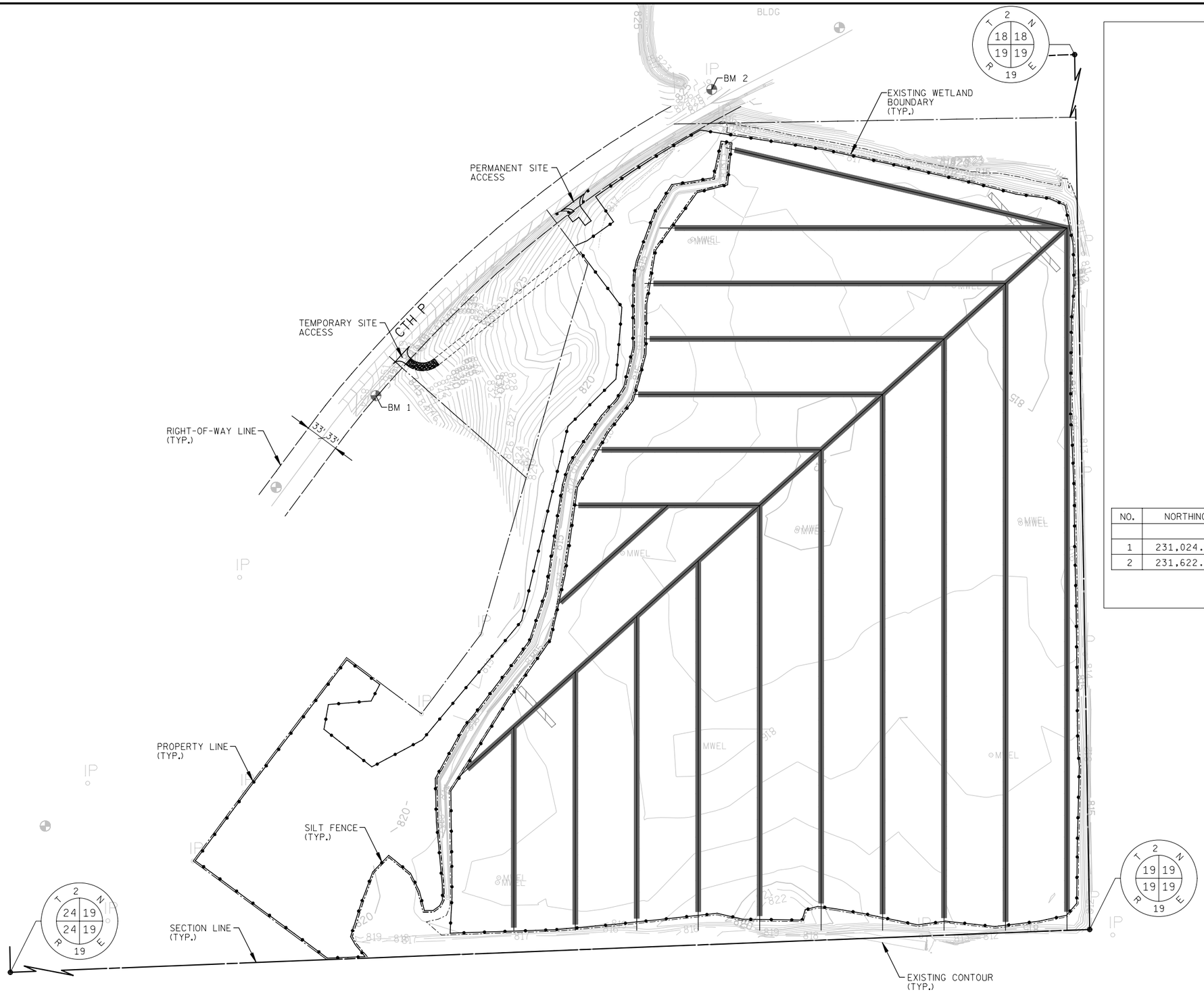


TIES

POINT	TO	POINT	DISTANCE (FT)
SECCOR	-	1	3.32
SECCOR	-	2	6.85
SECCOR	-	3	10.00
SECCOR	-	4	9.86
SECCOR	-	5	18.60
SECCOR	-	6	18.75
SECCOR	-	7	17.25

CENTER CORNER SECTION 19 T2N R19E
N.T.S.

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	ALIGNMENT TIES	SHEET	E



DRAIN TILE DISABLEMENT LEGEND

- DRAIN TILE (APPROXIMATE LOCATION)
- DRAIN TILE DISABLEMENT
- DRAIN TILE EXPLORATION

SUGGESTED DRAIN TILE DISABLEMENT SEQUENCE OF EVENTS

1. USE DRAIN TILE EXPLORATION TO EXPOSE THE DRAIN TILE MAIN LINE.
2. DISABLE DRAIN TILE MAIN LINE MAKING SURE TO LOCATE ALL CONNECTING DRAIN TILE LINES.
3. DISABLE ALL OTHER DRAIN TILE LINES LOCATED DURING DISABLEMENT OF DRAIN TILE MAIN LINE.

NOTES:

1. THE ENTIRE DRAIN TILE SYSTEM IS TO BE DISABLED.
2. TRENCH SHALL BE A MINIMUM WIDTH OF 12-INCHES.
3. SOIL AND DRAIN TILE EXCAVATED DURING DRAIN TILE DISABLEMENT TO BE BACKFILLED INTO THE TRENCH.
4. TRENCH SHALL REMAIN OPEN LONG ENOUGH FOR THE ENGINEER IN THE FIELD TO CONFIRM THAT THE DRAIN TILE HAS BEEN SUFFICIENTLY DISABLED.
5. DEPTH OF DRAIN TILE RANGES FROM 2-FEET TO 3.5-FEET BELOW GROUND SURFACE.
6. SEE DRAIN TILE DISABLEMENT CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

BENCH MARKS

NO.	NORTHING	EASTING	DESCRIPTION	ELEV.
1	231,024.57	457,295.86	RR SPIKE IN PP #89-05133	855.17
2	231,622.86	457,951.55	RR SPIKE IN PP	828.86

PROJECT NO: 3180-08-71	HWY: NON-HIGHWAY	COUNTY: RACINE	DRAIN TILE DISABLEMENT	SCALE, FEET 0 100 200	SHEET	E

3

REMOVING GUARDRAIL

LOCATION	204.0165 LF
PERMANENT SITE ACCESS POINT	82

TOTAL 82

EXCAVATION COMMON

LOCATION	205.0100 CY
TRACKING MAT	16.85

TOTAL 16.85

BASE AGGREGATE

LOCATION	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON
TEMPORARY SITE ACCESS POINT	13.69
PERMANENT SITE ACCESS POINT	43.00

TOTAL 56.69

3

BREAKER RUN

LOCATION	311.0110 TON
TRACKING MAT	58.97

TOTAL 58.97

ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES

LOCATION	465.0120 TON
TEMPORARY SITE ACCESS POINT	6.78
PERMANENT SITE ACCESS POINT	21.28

TOTAL 28.06

DRAIN TILE EXPLORATION

LOCATION	612.0700 (LF)
SOUTHWEST PORTION WETLAND RESTORATION AREA	100
NORTHEAST PORTION WETLAND RESTORATION AREA	200

TOTAL 300

STEEL PLATE BEAM GUARD CLASS A

LOCATION	614.0305 (LF)
PERMANENT SITE ACCESS POINT	53

TOTAL 53

3

MULCHING, SEEDING MIXTURE NO. 70, SEED BED PREPARATION, SEEDING, ROOTSTOCK PROTECTION, ROOTSTOCK, SEED MIX

LOCATION	627.0200* MULCHING SY	630.0170* SEEDING MIXTURE NO. 70 LB	630.0400* SEEDING NURSE CROP LB	SPV.0005.01 SEED BED PREPARATION ACRE	SPV.0005.02 SEEDING ACRE	SPV.0005.03 ROOTSTOCK PROTECTION ACRE	SPV.0060.01 ROOTSTOCK EACH	SPV.0085.01 SEED MIX LB
DEEP MARSH ROOTSTOCK PLANTING ZONE	24429			1.54		1.54	2685	
DEEP MARSH SEEDING ZONE				4.21	4.21			50.52
SHALLOW MARSH SEEDING ZONE				5.96	5.96			71.52
WET MEADOW SEEDING ZONE				21.41	21.41			256.92
TALL GRASS PRAIRIE SEEDING ZONE				5.05	5.05			60.60
TEMPORARY SITE ACCESS POINT	685	2.46	4.93					
UNDISTRIBUTED	68	0.25	0.49					
TOTALS	25182	2.71	5.42	38.17	36.63	1.54	2685	439.56

* NOTE: ADDITIONAL QUANTITIES OF THESE ITEMS ARE ALSO REQUIRED FOR ITEM NUMBER SPV.0105.02 GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

3

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF1	SF2	168	17
SF2	SF3	76	8
SF3	SF4	150	15
SF4	SF5	150	15
SF5	SF6	86	9
SF6	SF7	66	7
SF7	SF8	33	3
SF8	SF9	78	8
SF9	SF10	81	8
SF10	SF11	71	7
SF11	SF12	181	18
SF12	SF13	75	8
SF13	SF14	83	8
SF14	SF15	116	12
SF15	SF16	79	8
SF16	SF17	165	17
SF17	SF18	89	9
SF18	SF19	44	4
SF19	SF20	36	4
SF20	SF21	157	16
SF21	SF22	111	11
SF22	SF23	31	3
SF23	SF24	54	5
SF24	SF25	87	9
SF25	SF26	98	10
SF26	SF27	55	6
SF27	SF28	109	11
SF28	SF29	56	6
SF29	SF30	33	3
SF30	SF31	26	3
SF31	SF32	21	2
SF32	SF33	116	12
SF33	SF34	51	5
SF34	SF35	199	20
SF35	SF36	56	6

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF36	SF37	61	6
SF37	SF38	40	4
SF38	SF39	167	17
SF39	SF40	71	7
SF40	SF41	69	7
SF41	SF42	139	14
SF42	SF43	211	21
SF43	SF44	145	15
SF44	SF45	127	13
SF45	SF46	175	18
SF46	SF47	123	12
SF47	SF48	79	8
SF48	SF49	42	4
SF49	SF50	51	5
SF50	SF51	99	10
SF51	SF52	106	11
SF52	SF53	138	14
SF53	SF54	61	6
SF54	SF55	83	8
SF55	SF56	21	2
SF56	SF57	74	7
SF57	SF58	82	8
SF58	SF59	65	7
SF59	SF60	99	10
SF60	SF61	29	3
SF61	SF62	63	6
SF62	SF63	77	8
SF63	SF64	80	8
SF64	SF65	29	3
SF65	SF66	44	4
SF66	SF67	78	8
SF67	SF68	36	4
SF68	SF69	42	4
SF69	SF70	210	21
SF70	SF71	102	10
SF71	SF72	69	7
SF72	SF73	112	11

SILT FENCE

FROM	TO	628.1504 SILT FENCE L.F.	628.1520 SILT FENCE MAINTENANCE (10%) L.F.
SF73	SF74	30	3
SF74	SF75	116	12
SF75	SF76	85	9
SF76	SF77	123	12
SF77	SF78	29	3
SF78	SF79	12	1
SF79	SF80	16	2
SF80	SF81	17	2
SF81	SF82	39	4
SF82	SF83	39	4
SF83	SF84	55	6
SF84	SF85	45	5
SF85	SF86	62	6
SF86	SF87	72	7
SF87	SF88	18	2
SF88	SF89	30	3
SF89	SF90	74	7
SF90	SF91	321	32
SF91	SF92	164	16
SF92	SF93	328	33
SF93	SF94	80	8
SF94	SF95	37	4
SF95	SF96	84	8
SF96	SF97	49	5
SF97	SF98	119	12
SF98	SF99	112	11
SF99	SF100	303	30
SF100	SF101	390	39
SF101	SF102	132	13
SF102	SF103	141	14
SF103	SF104	135	14
SF105	SF106	24	2
SF106	SF107	64	6
SF107	SF108	60	6
SF108	SF109	56	6
SF109	SF1	186	19
UNDISTRIBUTED (25%)		2508	251
	TOTALS	12541	1261

3

3

EROSION CONTROL MOBILIZATIONS

LOCATION	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH
PROJECT 3180-08-71	2	2
TOTALS	2	2

TRAFFIC CONTROL

LOCATION	ITEM 643.0420 TRAFFIC CONTROL BARRICADES TYPE III DAYS	ITEM 643.0705 TRAFFIC CONTROL WARNING LIGHTS TYPE A DAYS	ITEM 643.0900 TRAFFIC CONTROL SIGNS DAYS
CTH P	288	288	576
TOTALS	288	288	576

* NOTE: SEE SDD 15D29-1 TRAFFIC CONTROL, VEHICLE ENTRANCE/EXIT OR HAUL ROAD FOR PLACEMENT

3

GEOTEXTILE FABRIC TYPE SAS

LOCATION	645.0140 SY
TRACKING MAT	116.46
TOTAL	116.46

DRAIN TILE DISABLEMENT

LOCATION	SPV.0090.01 LF
WETLAND RESTORATION AREA	13600
TOTAL	13600

CONSTRUCTION STAKING SEEDING AND PLANTING ZONES

LOCATION	SPV.0105.01 LS
WETLAND RESTORATION AREA	1
TOTAL	1

GRADING, SHAPING & FINISHING PERMANENT SITE ACCESS POINT

LOCATION	SPV.0105.02 LS
PERMANENT SITE ACCESS POINT	1
TOTAL	1

APPROXIMATE BID ITEM QUANTITIES REQUIRED FOR SPV.0105.02		
ITEM NO.	ITEM DESCRIPTION	QUANTITY
208.0100*	BORROW	570 CY
625.0500*	SALVAGED TOPSOIL	490 SY
627.0200*	MULCHING	490 SY
630.0170*	SEEDING MIXTURE NO. 70	1.73 LB
630.0400*	SEEDING NURSE CROP	3.47 LB

* NOTE: THESE QUANTITIES ARE NOT INCLUDED ELSEWHERE IN THE PLANS OR ESTIMATE

R/W PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
3180-08-21		
FEDERAL PROJECT NUMBER	4.0	

PLAT OF RIGHT OF WAY REQUIRED FOR

STH 11 - BURLINGTON BYPASS

WETLAND MITIGATION SITE

STH 11 — RACINE CO.

CONSTRUCTION NO. 3180-08-71

CONVENTIONAL SIGNS AND ABBREVIATIONS

ACCESS POINT	A.P.
ACCESS RIGHTS	A.R..
ACRES	AC.
AHEAD	AH.
AND OTHERS	ET. AL.
BACK	BK.
BARN	B
CENTERLINE	℄
CENTRAL ANGLE OR DELTA	△
CONSTRUCTION PERMIT	C.P.
CONVEYANCE	CONV.
CORNER	COR.
DEED	(D)
DIST. BETWEEN 1/4 CORNERS	(DIST.)
DOCUMENT	DOC.
ESTATE	EST.
EXCLUDING	EXCL.
FRONTAGE ROAD	FR. RD.
GARAGE	G
HOUSE	H
LAND CONTRACT	L.C.
LENGTH OF CURVE	L
LONG CHORD	L. CH.
MONUMENT	MON.
OUTLOT	O.L.
PERMANENT	PERM.
PROPERTY LINE	P.L.
QUIT CLAIM DEED	Q.C.D.
RADIUS	R
REFERENCE LINE	ℝ
RELOCATED	RELOC.
REMAINING	REM.
RIGHT OF WAY	R/W
SECTION	SEC.
SEVERED	SEV.
STATION	STA.
TANGENT	TAN.
TEMPORARY	TEMP.
TEMPORARY INTEREST	TI
TRANSIT LINE	℄
BRIDGE	
BUILDING	(Label)
CATTLE PASS	
IRON PIPE	I.P.
POWER POLE	
TELEPHONE POLE	
TELEPHONE PEDESTAL	T.P
R/W MONUMENT	
R/W STANDARD	
GAS PUMP ISLAND	G.P.

STATE LINE	
COUNTY LINE	
TOWN AND RANGE LINE	
SECTION LINE	
QUARTER LINE	
SIXTEENTH LINE	
NEW CENTERLINE	
OLD CENTERLINE	
PROPOSED OR NEW R/W LINE	
EXISTING R/W LINE	
PROPERTY LINE	
LOT, TIE AND OTHER MINOR DASHED LINES	
SLOPE INTERCEPTS	
CORPORATE LIMITS	
WATER	W
GAS	G
TELEPHONE OR TELEGRAPH	T
ELECTRIC	E
CABLE TELEVISION	TV
FIBER OPTIC	FO
SANITARY SEWER	SAN
STORM SEWER	SS
NO ACCESS (By Previous Acquisition)	
NO ACCESS (By Acquisition)	
NO ACCESS (By Statutory Authority)	
LIMITED EASEMENT (Temporary or Permanent)	
WELL	WELL
SEPTIC PUMP	S.P.
SEPTIC TANK	S.T.
SEPTIC VENT	S.V.
SIGN	SIGN

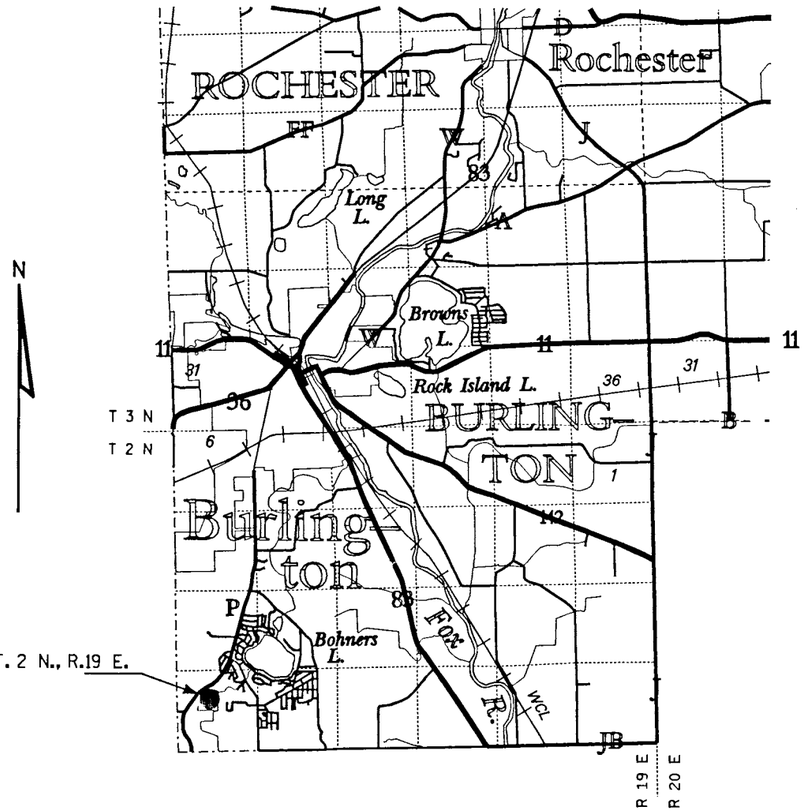
NOTES

ALL COORDINATES ARE GROUND BASED.

BEARINGS ON THIS PLAT ARE ORIENTED TO THE WISCONSIN COORDINATE SYSTEM SOUTH ZONE. ALL PLAT DISTANCES ARE GROUND LENGTH AND MAY BE CONVERTED TO GRID LENGTH BY MULTIPLYING THE THE DISTANCE BY THE GRID FACTOR PROVIDED ON THE DETAIL SHEETS.

RIGHT OF WAY MONUMENTS ARE AND ARE PLACED PRIOR TO OR AT THE TIME OF LAND TITLE TRANSFER.

RIGHT OF WAY BOUNDARIES ARE DEFINED WITH COURSES OF THE PERIMETER OF THE HIGHWAY LANDS REFERENCED TO THE U.S. PUBLIC LAND SURVEY OR OTHER SURVEYS OF PUBLIC RECORD.



SITE LOCATION IN THE NW 1/4 OF SEC. 19, T. 2 N., R.19 E.

LAYOUT

SCALE 0 1 MI.

REVISION DATE	STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION
	APPROVED FOR DISTRICT OFFICE: DATE: 11/2/98 Michael La Pietra

3180-08-21 4.0

PLOT SCALE : ..plotscale.. PLOT DATE: ..plottingdate..

REV. DATE:

LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

ORIGINATOR:

FILE NAME: RAC.DGN

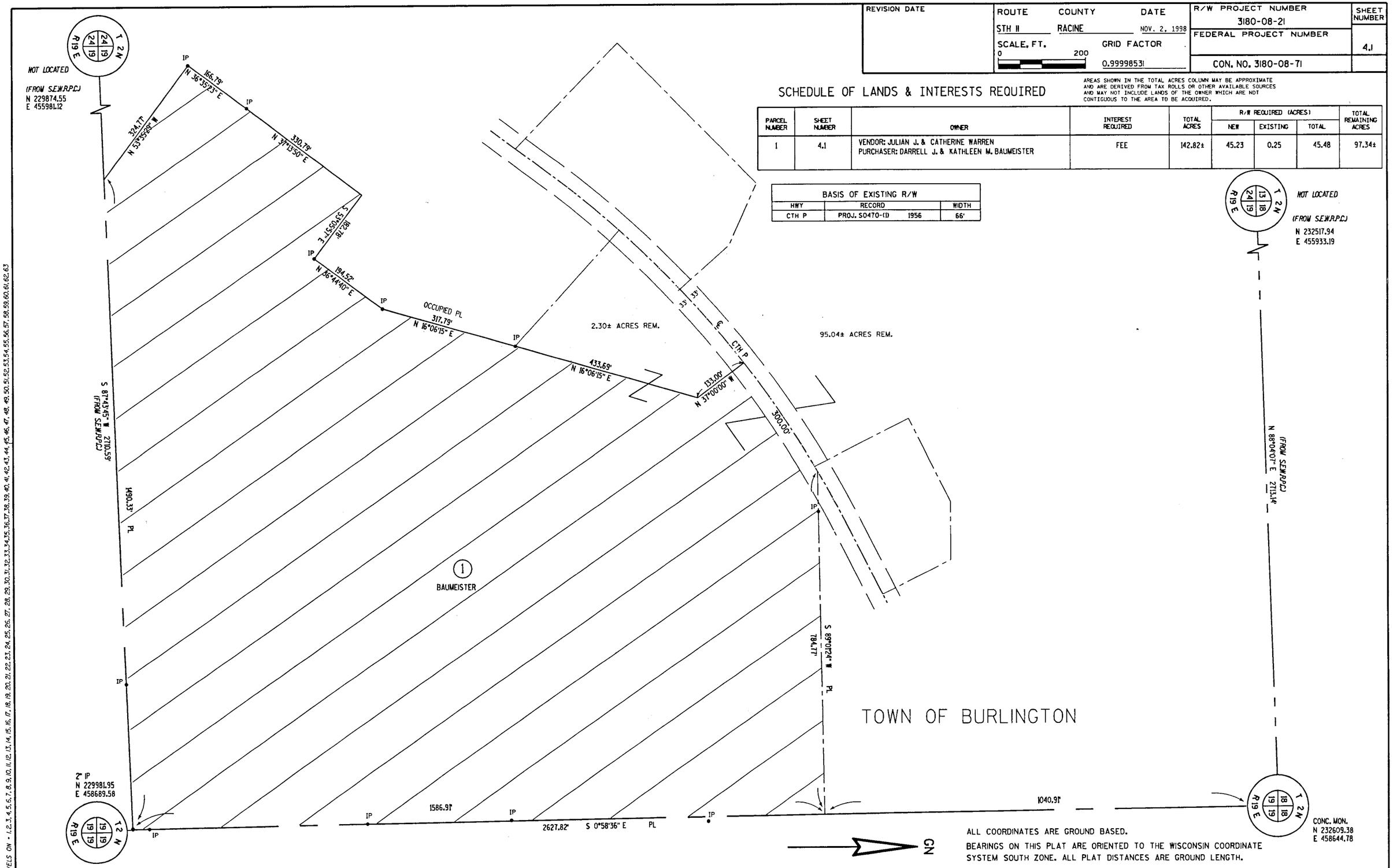
REVISION DATE	ROUTE	COUNTY	DATE	R/W PROJECT NUMBER	SHEET NUMBER
	STH 11	RACINE	NOV. 2, 1998	3180-08-21	
	SCALE, FT. 0 200	GRID FACTOR 0.99998531		FEDERAL PROJECT NUMBER	4.1
				CON. NO. 3180-08-71	

SCHEDULE OF LANDS & INTERESTS REQUIRED

AREAS SHOWN IN THE TOTAL ACRES COLUMN MAY BE APPROXIMATE AND ARE DERIVED FROM TAX ROLLS OR OTHER AVAILABLE SOURCES AND MAY NOT INCLUDE LANDS OF THE OWNER WHICH ARE NOT CONTIGUOUS TO THE AREA TO BE ACQUIRED.

PARCEL NUMBER	SHEET NUMBER	OWNER	INTEREST REQUIRED	TOTAL ACRES	R/W REQUIRED (ACRES) NEW	EXISTING	TOTAL	TOTAL REMAINING ACRES
1	4.1	VENDOR: JULIAN J. & CATHERINE WARREN PURCHASER: DARRELL J. & KATHLEEN M. BAUMEISTER	FEE	142.82±	45.23	0.25	45.48	97.34±

BASIS OF EXISTING R/W		
HWY	RECORD	WIDTH
CTH P	PROJ. 50470-(1) 1956	66'



ALL COORDINATES ARE GROUND BASED.

BEARINGS ON THIS PLAT ARE ORIENTED TO THE WISCONSIN COORDINATE SYSTEM SOUTH ZONE. ALL PLAT DISTANCES ARE GROUND LENGTH.

LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

FILE NAME: HDGN: CADD.DGN

ORIGINATOR: DISTRICT 2

REV. DATE:

PLOT SCALE:

PLOT NAME:

EXHIBIT 3:
Special Provisions
for the
Baumeister Wetland Mitigation Site Construction

Special Provisions

Table of Contents

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5.	Environmental Protection.	3
6.	Steel Plate Beam Guard Class A	4
7.	Mulching	4
8.	Seed Bed Preparation, Item SPV.0005.01	4
9.	Seeding, Item SPV.0005.02.	5
10.	Rootstock Protection, Item SPV.0005.03.	6
11.	Rootstock, Item SPV.0060.01	7
12.	Seed Mix, Item SPV.0085.01.	9
13.	Drain Tile Disablement, Item SPV.0090.01	13
14.	Construction Staking Seeding and Planting Zones, Item SPV.0105.01	13
15.	Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02	14

SPECIAL PROVISIONS

1. General.

Perform the work under this construction contract for Project 3180-08-71, City of Burlington Bypass (Wetland Mitigation – Baumeister Farm), located in the Town of Burlington, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2003 Edition, the Supplemental Specifications 2005 Edition, and these special provisions including the Additional Special Provisions (ASP's). The department considers only standard specifications, supplemental specifications and interim supplemental specifications issued directly from the department as valid for this contract.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.
(100105)

2. Scope of Work.

The work under this contract consists of construction of a site access point and wetland restoration at a 45.5-acre site and includes drain tile disablement, seedbed preparation, seeding, rootstock planting, rootstock protection and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract. (082003)

3. Prosecution and Progress

Begin work within 10 calendar days after the engineer issues a written notice to proceed.

Provide the start date to the engineer in writing within one month after executing the contract, but at least 14 calendar days before the preconstruction conference. Upon approval, the engineer will issue the notice to proceed within 10 calendar days before the approved start date.

To revise the start date, submit a written request to the engineer at least two weeks before the intended start date. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department's scheduled resources.

Proceed according to the following schedule of operations:

1. Install temporary site access point

2. Install erosion control
3. Install temporary stream crossings, if necessary
4. Disable drain tile (Suggested sequence: Complete drain tile exploration at each end of the main then disable the main. Locate and flag tile laterals as the main is disabled, then disable all lateral tiles).
5. Complete all work within the seeding and planting areas (October 7 to November 15, 2006)
6. Remove temporary crossings (if installed)
7. Install permanent access point
8. Restore disturbed areas

All topsoil stripped to construct the temporary site access point and tracking pad is to be placed in a neat pile on site with the project manager's approval. The pile should be near the entrance for the temporary site access point and will be removed by others.

4. Utilities

This contract is not subject to the provisions of Administrative Rule TRANS 220.

There are known utility facilities located adjacent to the project limits. Coordinate construction activities with a call to Diggers Hotline per statutes. Use caution to ensure the integrity of underground facilities and overhead lines. Bidders are advised to contact each utility listed in the plans prior to preparing their bids. The following is a list of the utilities with facilities in the area:

We Energies – Electric
We Energies has electric facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

We Energies – Gas Operations
We Energies has gas facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

SBC
SBC has a telephone line located in the right-of-way southeast of CTH P. The proposed work for the site access points is above this line. Although this facility is below the proposed work, it will not have any conflicts with the proposed work.

Time Warner Cable
Time Warner Cable has facilities located on the northwest side of CTH P. These facilities will not have any conflicts with the proposed work.

5. Environmental Protection.

Section 107.18 of the Standard Specifications is supplemented as follows:

All equipment to be used on the site must be relatively free of material that may contain

weed seed, such as purple loosestrife or other non-native and/or invasive species, upon entering or exiting the site. Make equipment available for inspection by the engineer prior to operating within the mitigation site limits.

Provide the Erosion Control Implementation Plan (ECIP) 14 days prior to the Pre-Construction Conference.

Blanding's turtles are known to occur adjacent to the project area. If any Blanding's turtles are observed within the construction area, they should be immediately relocated out of the construction area and to a suitable location as approved by the engineer in the field.

Do no store or operate equipment, stockpile materials, or place settling basins in wetlands as shown on the plan, unless approved by the engineer.

Broom or brush any mud, dirt or debris deposited on CTH P or other roads, as a result of entering and leaving the construction site, as directed and approved by the engineer.

6. Steel Plate Beam Guard Class A.

Radii tighter than 75 feet shall be shop bent by the manufacturer prior to delivering the beam guard to the project site.
(082003) 614-020

7. Mulching

Perform this work in accordance with the Section 627 of the Standard Specifications, except as hereinafter modified.

Provide mulching material for all seeding areas, consisting of clean straw free of debris, with no weed seed, including reed canary grass, purple loosestrife, Canada thistle, giant reed grass, leafy spurge, spotted knapweed, box elder, buckthorn, or other non-native and/or invasive species.

Place mulch the same day of seeding. Where required, uniformly spread mulch over the seeded zones as indicated on the plan to a loose depth of ½ to 1½ inch by blowing from a machine, by hand, or as directed by the engineer.

8. Seed Bed Preparation, Item SPV.0005.01

A Description
This special provision describes preparing the seed bed for planting rootstock and seeding in the deep marsh zone, and seeding in the shallow marsh, wet meadow and tall grass prairie zones as shown on the plan and as hereinafter provided.

B Materials (Vacant)

C Construction Methods
Provide the engineer with 5 working days notice prior to any discing. Mow existing vegetation to within 6 inches of the ground surface. Work the upper 6 inches of topsoil at locations specified in the plan until the size of existing vegetation, stalks, leaves and other biomass does not exceed an average of 6 inches in size, or as directed by the engineer. Disc no more than 7 days prior to the time of seeding or as directed by the engineer. If planting does not occur within 7 days following discing, repeat specified discing (at the cost of the contractor) to ensure a proper seeding surface. Once discing has been performed, prohibit driving over the disced area with equipment or vehicles prior to seeding activities.

D Method of Measurement
The department will measure Seed Bed Preparation by the acre acceptably prepared.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.01	Seed Bed Preparation	Acre

Payment is full compensation for discing and firming the seed bed and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

9. Seeding, Item SPV.0005.02.

A Description
This special provision describes storing, mixing, sowing and raking the seed mix provided under Seed Mix, in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones as shown on the plans or as directed by the engineer. Perform seeding in accordance with the requirements hereinafter provided.

B Materials
Utilize native seed provided in accordance with Seed Mix, Item SPV.0085.01.

C Construction Methods
Mix the seed at the project site according to the seeding schedules specified under the item of Seed Mix, or as directed by the engineer. Sow seed after October 15, 2006 and prior to November 15, 2006. Do not seed in flooded areas or when conditions are otherwise unsatisfactory for seeding. Provide the engineer 5 working days' notice prior to any seeding activities.

Mix and sow seed on the same day. Sow cover crop and native seed together. Seed using Method A, Section 630.3.3.1 in the Standard Specifications and the following additional techniques.

C.1 Shallow Marsh Seeding Zone (5.96 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Deep Marsh Seeding Zone (4.21 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.3 Wet Meadow Seeding Zone (21.41 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

C.2 Tall Grass Prairie Seeding Zone (5.05 Acres)
Sow native seed at a rate of 12.0 pounds per acre. Sow cover crop at a rate of 20.0 pounds per acre. Mix seed with moist sand or sawdust on site prior to seeding. Provide water on site to moisten the sand or sawdust using a ratio of one part moist sand or moist sawdust to one part native seed mix by volume. After seeding, lightly rake the area to cover the seed with approximately 1/2-inch of soil.

D Measurement
The department will measure Seeding by the acre acceptably completed.

E Basis of Payment
The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.02	Seeding	Acre

Payment is full compensation for handling, on-site storage of seed, weighing, mixing, sowing and raking; supplying water, sand, and/or sawdust for mixing seed; and for all labor, tools, equipment and incidentals necessary to complete the work.

10. Rootstock Protection, Item SPV.0005.03.

A Description

This special provision describes furnishing, installing, and maintaining Rootstock Protection according to the plan, and as directed by the project engineer. Install Rootstock Protection prior to the rootstock planting. Maintain Rootstock Protection throughout the life of the contract, as needed, or within 24 hours of notification by the engineer.

B Materials

Use posts consisting of 1-inch by 2-inch by 5-foot wooden stakes and cross members consisting of biodegradable, natural organic fiber bailing twine.

C Construction

Install posts a minimum of 2 feet into the ground or to a depth that secures the post and resists being pushed over. Install Rootstock Protection in such a manner as to provide grid-like patterns 10 feet by 20 feet through the area of the rootstock plantings. Extend the perimeter of the Rootstock Protection 2 feet in all directions beyond the limits of the rootstock plantings. Attach bailing twine for cross members to all posts as shown in the plan using knots or any other means approved by the engineer. Attach bailing twine to all intermediate posts by means approved by the engineer.

D Measurement

The department will measure Rootstock Protection per unit acre acceptable completed.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.03	Rootstock Protection	Acre

Payment is full compensation for furnishing all materials, installing posts, cross members, disposal of surplus materials; maintaining the Rootstock Protection through the life of the contract; and for all labor, tools, equipment, and incidentals necessary to install the Rootstock Protection.

11. Rootstock, Item SPV.0060.01

A Description

This special provision describes furnishing and planting wetland herbaceous plant rootstock of the species specified, complete in place in the deep marsh rootstock planting area as designated on the plans, or as directed by the engineer. It includes furnishing all necessary materials and performing all necessary work such as excavating plant holes, anchoring rootstock, and necessary care, such as trimming, required replacements pending acceptance, and such work necessary and incidental thereto to complete the item in accordance with the plans, specifications and contract.

B Materials

The source of all plant materials is nursery-grown stock, not wild-collected, from an area not to exceed 150 linear miles from the project site, and within the State of Wisconsin. All plants must be healthy, 1 to 2 years old, and have well-developed root systems. Plants that show evidence of mold, rot, freezing, or frost damage will be rejected. Where evidence is submitted that a specified rootstock cannot be obtained, substitutions may be made upon the specific approval of the engineer.

Deep Marsh (1.54 Acres)

Scientific Name	Common Name	Quantity
Scirpus atrovirens	blue green bulrush	500
Scirpus fluviatilis	river bulrush	500
Scirpus validus	softstem bulrush	500
Acorus calamus	duck potato	500
Sparganium eurycarpum	giant bur-reed	300
Pontedaria cordata	pickerelweed	200
Sagittaria latifolia	broad-leaved arrowhead	185
	Total:	2,685

C Construction Methods

Plant rootstock in the deep marsh planting zone prior to seeding and mulching operations and within the specified planting periods. Provide the engineer with 5 working days notice of the intended date of delivery of Rootstock to the project site. Present all rootstock to the engineer for inspection and partial acceptance prior to planting.

C.1 Timing

Plant wetland rootstock on the day of delivery at the project site. In the event that this is not possible, temporarily store plants by placing them in a well-ventilated, cool, shaded, moist storage space (not to exceed 48 hours).

C.2 Planting layout

Plant Rootstock at a density of approximately 1750 per acre within the deep marsh planting zone as shown in the plan or as directed by the engineer.

C.3 Planting Method

Plant Rootstock by hand with the use of a tree spud or other comparable method; or as directed by the engineer.

C.4 Care

Handle Rootstock with care and skill to prevent damage; keep moist and cool prior to planting. Do not disturb freshly planted Rootstock with subsequent activities that would cause uprooting or injury.

D Measurement

The department will measure Rootstock as each individual rootstock acceptably planted according to the contract.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Rootstock	Each

Payment is full compensation for furnishing, delivering, storing and planting the plants and for furnishing all labor, tools, and equipment and incidentals necessary to complete the work.

12. Seed Mix, Item SPV.0085.01.

A Description
This special provision describes supplying native seed for planting in the deep and shallow marsh, wet meadow and tall grass seeding zones as indicated on the plan; supplying seed samples, germination test data and storage and delivery of seed; all in accordance with the special provisions provided herein.

B Material
Use the following native seed specifications during seed acquisition.

1. Provide native seed true to species, packed separately, with label information including scientific and common name, quantity, date and location picked, name and company supervising the picking.

2. Provide seed free of non-seed debris and of non-native and/or invasive species including, but not limited to, reed canary grass, purple loosestrife, spotted knapweed and Canada thistle.

3. Provide seed of local ecotype and origin no further than 150 linear miles from the project location, and from within the State of Wisconsin.

4. Provide seed that was picked at the appropriate time for ripeness and viability. Obtain germination test results and certification for a random sample of each species prior to receiving delivery of the seed. Provide written documentation of germination tests to the engineer prior to seeding.

5. Accept seed only if it has a minimum germination rate of 80 percent. If the seed does not meet the minimum required 80 percent germination rate, additional seed must be supplied at the cost of the seed supplier/contractor to meet the total viable seed quantity.

6. Deliver a representative sample of each species to the engineer for inspection and

identification prior to the acceptance of the seed.

7. Provide cover crop in the deep marsh, shallow marsh, wet meadow and tall grass prairie seeding zones consisting of perennial rye (*Lolium perenne*).

8. Use the following seeding schedule in each of the designated zones. Substitutions or changes to the seeding schedule must be approved by the engineer prior to seeding. All seed quantities provided assume a minimum 80% germination rate.

B.1 Seed Mixes
Seeding rates and mixes are as follows, or as directed by the engineer:

B.1.1 Shallow Marsh Seeding Zone (5.96 Acres)
The seed mix for the shallow marsh planting zone is composed of 71.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 119.2 pounds of cover crop in the shallow marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 71.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total shallow marsh seed mix.

Scientific Name	Common Name
Glyceria striata	manna grass
Alisma triviale	water plantain
Scirpus acutus	hard stem bulrush
Scirpus cyperinus	wool grass
Scirpus validus	softstem bulrush

B.1.2 Deep Marsh Seeding Zone (4.21 Acres)
The seed mix for the deep marsh planting zone is composed of 50.52 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 84.2 pounds of cover crop in the deep marsh seeding zone.

Seed native seed at 12 pounds per acre for a total of 50.52 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total deep marsh seed mix.

Scientific Name	Common Name
Scirpus atrovirens	blue green bulrush
Scirpus fluviatilis	river bulrush
Acorus calamus	duck potato
Sparganium eurycarpum	giant bur-reed
Pontedaria cordata	pickerelweed
Sagittaria latifolia	broad-leaved arrowhead
Zizania aquatica	wild rice

B.1.3 Wet Meadow Seeding Zone (21.41 Acres)

The seed mix for the wet meadow planting is composed of 85.64 pounds of sedges and rushes, 85.64 pounds of grasses and 85.64 pounds of forbs, for a total of 256.92 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 428.2 pounds of cover crop in the wet meadow seeding zone.

a. Sedges and Rushes. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 5 species, with no individual species comprising more than 25% of the total sedge and rush seed mix.

Scientific Name	Common Name
Carex comosa	bottlebrush sedge
Carex cristatella	crested oval sedge
Carex granularis	meadow sedge
Carex hystericina	porcupine sedge
Carex scoparia	lance-fruited oval sedge
Carex stipata	awl-fruited sedge
Carex vulpinoidea	fox sedge
Scirpus atrovirens	green bulrush
Scirpus validus	soft-stemmed bulrush

b. Grasses. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 3 species, with no individual species comprising more than 35% of the total grass seed mix.

Scientific Name	Common Name
Elymus canadensis	Canada wild rye
Glyceria striata	fowl manna grass
Calamagrostis canadensis	Canada blue joint
Leersia oryzoides	rice cut grass

c. Forbs. Seed at 4 pounds per acre for a total of 85.64 pounds. Provide a minimum of 10 species, with no individual species comprising more than 15% of the total forb seed mix.

Scientific Name	Common Name
Solidago gigantea	giant goldenrod
Aster puniceus	bristly aster
Aster novae-angliae	New England aster
Helenium autumnale	sneezeweed
Verbena hastata	blue vervain
Mimulus ringens	monkey flower
Thalictrum dasycarpum	tall meadow rue
Vernonia fasciculata	ironweed
Angelica atropurpurea	angelica
Asclepias incarnata	marsh milkweed
Eupatorium maculatum	joe pye weed
Eupatorium perfoliatum	boneset

B.1.4 Tall Grass Prairie Seeding Zone (5.05 Acres)

The seed mix for the tall grass prairie seeding zone is composed of 40.40 pounds of grasses and 20.20 pounds of forbs, for a total of 60.60 pounds of native seed. Cover crop is seeded at 20 pounds per acre for a total of 101.00 pounds of cover crop in the tall grass prairie seeding zone.

Grasses. Seed at 8 pounds per acre for a total of 40.40 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total grass seed mix.

Scientific Name	Common Name
Andropogon gerardii	big bluestem
Bouteloua curtipendula	side oats grama
Elymus canadensis	Canada wild rye
Panicum virgatum	switch grass
Sorghastrum nutans	Indian grass
Sporobolus heterolepsis	prairie dropseed
Schizachyrium scoparium	little bluestem

Forbs. Seed at 4 pounds per acre for a total of 20.20 pounds. Provide a minimum of 5 species, with no individual species comprising more than 30% of the total forb seed mix.

Scientific Name	Common Name
Desmodium canadense	tick clover
Echinacea purpurea	purple coneflower
Heliopsis helianthoides	oxeye sunflower
Monarda fistulosa	bergamot
Ratibida pinnata	yellow coneflower
Rudbeckia hirta	black-eyed susan
Solidago rigida	stiff goldenrod

C (Vacant)

D Measurement

The department will measure Seed Mix meeting the required 80 percent germination rate by actual pounds of native seed supplied.

Native seed not meeting the required 80 percent germination rate will be measured by the equivalent pounds, based on the following formula for each species.

Equivalent pounds =
(number of actual pounds of native seed supplied) X (actual percent germination rate/80)

E Basis of Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER DESCRIPTION UNIT

SPV.0085.01	Seed Mix	LB

Payment is full compensation for furnishing and delivery of native seed and cover crop to the project site, providing seed samples and germination data and the necessary labor, tools, equipment, and incidentals necessary to complete the work.

13. Drain Tile Disablement, Item SPV.0090.01

A Description

This special provision describes disabling the existing drain tile system by removing the cover soil and crushing the tile in place followed by filling the resulting trench as hereinafter provided.

B Materials (Vacant)

C Construction Methods

Disable drain tile prior to any seeding or planting in the specified seeding zones. Drain Tile Exploration, Item 612.0700 will be accomplished to verify the approximate location of the drain tile main as shown on the plans. Disable drain tile by excavating a trench as shown in the plans at the approximate location shown on the plan and as identified per Drain Tile Exploration, Item 612.0700. Utilize a back hoe or similar equipment to complete excavation. After drain tile has been exposed, crush the tile with a back hoe bucket or equivalent. Drain tile will be considered sufficiently crushed when no tile fragments greater than 6 inches in diameter remain. Once the engineer has verified that the tile has been sufficiently crushed, fill the resulting trench with the spoil removed during the tile excavation.

D Method of Measurement

The department will measure Drain Tile Disablement by the linear foot acceptably disabled.

E Basis of Payment

The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0090.01	Drain Tile Disablement	LF

Payment is full compensation for disabling drain tile, filling the resulting trench and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

14. Construction Staking Seeding and Planting Zones, Item SPV.0105.01

A Description

This special provision describes locating and staking the boundaries of the silt fence and seeding and planting zones as shown on the plans.

B Materials
Use wooden lath a minimum of 4 feet in length labeled with the appropriate information (station, location of seeding or planting zones).

C Construction Method
Once boundaries are located, install lath a minimum of 1 foot into the ground or to a depth that secures the lath and resists being pushed over. Stake boundaries of the seeding and planting zones at a minimum of 50-foot intervals or such intervals required to properly delineate boundaries.

D Method of Measurement
The department will measure Construction Staking Seeding and Planting Zones as a single lump sum unit for each construction staking acceptably completed.

E Basis of Payment
The department will pay for measured quantity at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.01	Construction Staking Seeding and Planting Zones	LS

Payment is full compensation for furnishing all materials, locating boundaries, installing and labeling lath, and for all labor, tools, equipment, and incidentals necessary to complete the work required under this bid item.

15. Grading, Shaping & Finishing Permanent Site Access Point, Item SPV.0105.02

A Description
This special provision describes excavating, filling, grading, shaping and compacting and finishing as necessary to construct the permanent site access point as shown on the plans, and in accordance with the pertinent requirements of the standard specifications and as hereinafter provided.

B (Vacant)

C Construction
Dispose of all surplus and unsuitable material in accordance with 205.3.12 of the standard specifications.

D Measurement
The department will measure Grading, Shaping and Finishing Permanent Site Access Point as a single complete unit of work.

E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0105.02	Grading, Shaping & Finishing Permanent Site Access Point	LS

Payment is full compensation for all excavation, grading, shaping, and compacting; providing and placing fill, salvaged topsoil, seed, and mulch; and for furnishing all labor, tools, equipment and incidentals necessary to complete the contract work.

The base course, surfacing and finishing items will be measured and paid for under the pertinent items provided in the contract.

Appendix H | Robert E. Lee & Associates Vegetation Management Reports

2017 ANNUAL VEGETATION MAINTENANCE REPORT

BAUMEISTER WETLAND MITIGATION SITE

Racine County

Project ID 1000-30-90

Prepared for:

Ms. Brenda Ruenger
Regional Environmental Coordinator
Wisconsin Department of Transportation
Southeast Region
141 NW Barstow Street
P.O. Box 798
Waukesha, WI 53187-0798

Prepared By:

Robert E. Lee & Associates, Inc.
Engineering • Surveying • Environmental Services

1250 Centennial Centre Boulevard
Hobart, WI 54155

December 27, 2017

Introduction

Robert E. Lee and Associates (REL) was contracted by the Wisconsin Department of Transportation (WisDOT) Southeast Region to conduct vegetation management on the Baumeister Wetland Mitigation Site in the Town of Burlington, Racine County, Wisconsin (Figure 1). Management included an invasive species survey and maintenance activities.

Monitoring & Maintenance

Invasive Species Survey

REL ecologists conducted a meander survey on June 8 and 9 to document the presence of reed canary grass (*Phalaris arundinacea*), common reed (*Phragmites australis*), stinging nettle (*Urtica dioica*), giant ragweed (*Ambrosia trifida*) and garlic mustard (*Allaria petiolata*). Identified populations of invasive species were surveyed with a Trimble GPS (sub-meter accuracy) unit and their percent coverage estimated (Figure 2). Coverage was determined using the perpendicular projection to the ground from the outline of the aerial parts of the plant species and reported as the percent of the total area (e.g., substrate or water surface) covered. The Daubenmire methodology was then utilized to rank estimated foliage cover based on the percentages found in Table 1. By providing a range of percent foliage cover for each rank, the Daubenmire Classification Scheme helps minimize errors due to observer bias, visual estimation, etc.

Table 1. Daubenmire Classification Scheme Cover Ranking System.

Percent Foliage Cover	Rank
0-5	1
5-25	2
25-50	3
50-75	4
75-95	5
95-100	6

Populations are depicted as polygons. An approximate areal coverage for larger populations, utilizing the method above, has been included on the map. Polygons on the map list invasive species and Daubenmire coverage within the polygon due to multiple invasive species being present in areas of the site.

Maintenance Activities

Prior to conducting any herbicide applications over water at the site, an Aquatic Plant Management permit for the chemical application was secured from the Wisconsin Department of Natural Resources (WDNR). REL staff applied herbicide to control reed canary grass, common reed and garlic mustard within the site. Table 2 summarizes the date of visits, chemicals and rate used, species targeted, whether or not an aquatic permit was necessary for the application, and activities conducted. In addition to conducting herbicide treatments, reed canary grass was mowed to set back seed heads where densities were low and follow up treatment would occur. Giant ragweed was also mowed to set back growth. Mowing was avoided in

areas of dense garlic mustard to avoid spreading seed. Garlic mustard was also pulled and bagged in the southeast corner of the site where the neighboring landowners had complained about its presence.

Table 2. Maintenance activities completed throughout the field season.

Date	Herbicide	Application Rate (oz/gal)	Raw Amount Used (oz)	Target Species	Aquatic	Task
6/8/2017	--	--	--	Garlic Mustard	--	Pull and Bag
6/8/2017	--	--	--	Reed Canary Grass Giant Ragweed	--	Mow
10/13/2017	AquaNeat	2	146	Reed Canary Grass Garlic Mustard	No	Foliar (spot)
10/13/2017	Polaris	2.5	0.75	Common Reed	No	Foliar (spot)

All chemical applications during the 2017 growing season were conducted using AquaNeat®, (active ingredient: glyphosate) or Polaris® (active ingredient: Imazapyr) with MSO as a surfactant, and Hi-Light Blue as a marking dye. All conditions including container disposal and wearing the appropriate Personal Protective Equipment (PPE) listed, etc. on the chemical labels were followed.

Applications did not occur if:

- Winds >15 mph
- Vegetation was wet
- Rain was expected within two hours of treatment
- Temperature inversions were possible

Herbicide signs denoting a chemical application had occurred were posted around the site before each treatment and herbicide records were completed and submitted to WisDOT within 30 days after treatment. Treatment records were not submitted to the WDNR as the site was dry during the application; therefore, the aquatic permit was not utilized and REL submitted reimbursement paperwork to the State.

Conclusions & Recommendations

REL recommends treating garlic mustard early in the spring of 2018. Continued control of reed canary grass should be performed in areas where the density is low and control can be efficiently performed without forming large dead areas. Follow-up treatment on common reed should also be performed.



Photo 1 – North end of mitigation site facing Southeast, viewing dense reed canary grass (6/8/17).



Photo 2 – Southeast corner of mitigation site, viewing dense garlic mustard (6/8/17).



Photo 3 – East side of mitigation site, viewing dense stinging nettle (6/8/17).



Photo 4 – South side of mitigation site, viewing giant ragweed mowing (6/8/17).



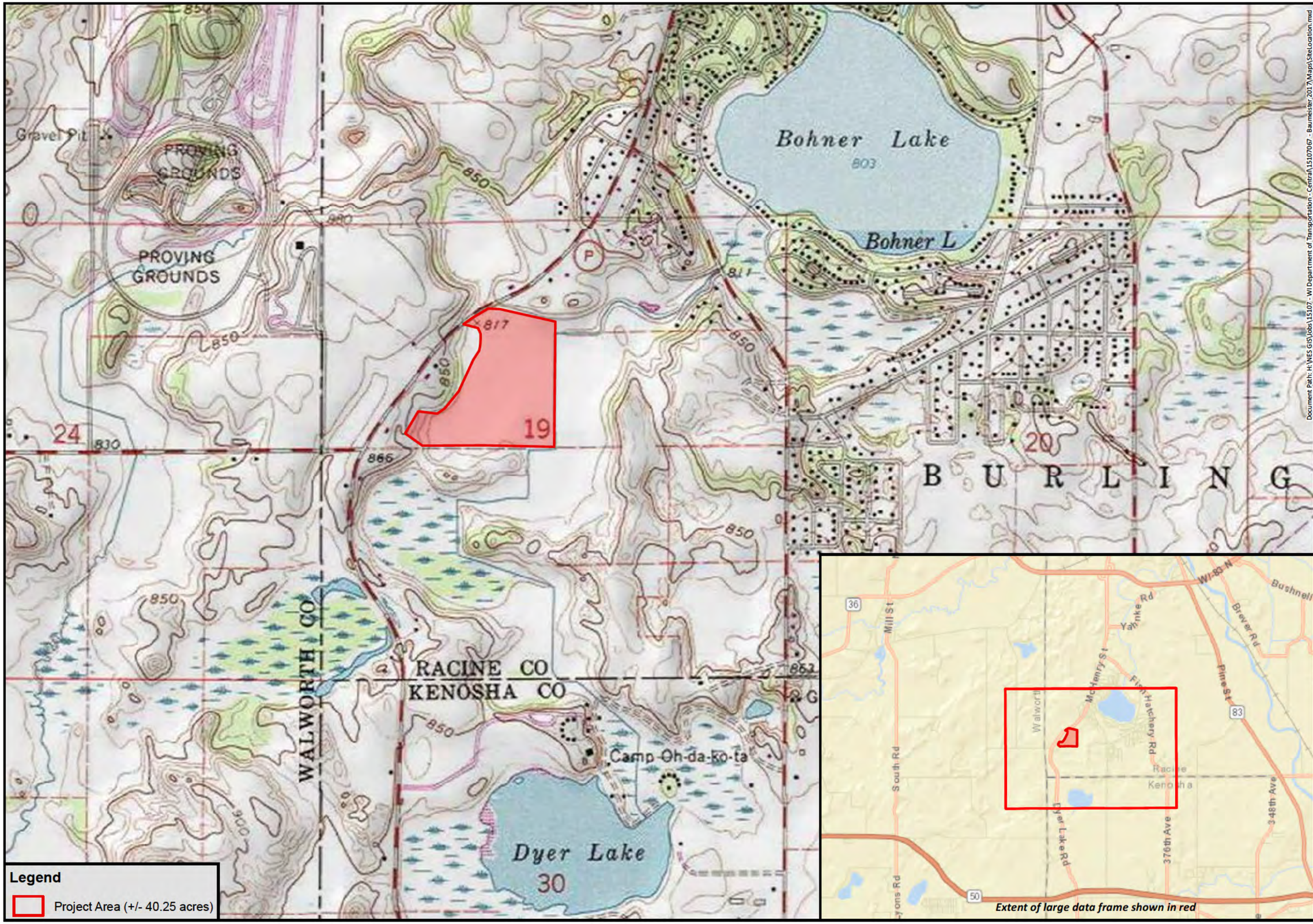
Photo 5 – South side of mitigation site, viewing garlic mustard growing with giant ragweed (6/8/17).



Photo 6 – Garlic mustard basal leaves during fall treatment (10/13/17).



Photo 7 – Reed canary grass during fall treatment (10/13/2017).



Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 1
Site Location

12/7/2017

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
REL Project No. 15107067
Town of Burlington
Racine County, Wisconsin

Located in part of:
Section 19, T2N, R19E
Town of Burlington
Racine County
Wisconsin

N

0 1,000
Feet

Document Path: H:\NES GIS\Jobs\15107 - WI Department of Transportation - Central\15107067 - Baumeister 2017\Maps\SiteLocation.mxd

Phalaris arundinacea 6

Phalaris arundinacea 1
Cirsium arvense 1

Phalaris arundinacea 5

Phalaris arundinacea 2

Urtica dioica 6
Allaria petiolata 1
Phalaris arundinacea 1
Ambrosia trifida 1

Phalaris arundinacea 2

Phalaris arundinacea 3

Ambrosia trifida 5 (mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 4

Phalaris arundinacea 5
Urtica dioica 4
Ambrosia trifida 4
Allaria petiolata 2

Phalaris arundinacea 2

Urtica dioica 5
Phalaris arundinacea 3
Ambrosia trifida 2
Allaria petiolata 2

Ambrosia trifida 5
Allaria petiolata 2
Phalaris arundinacea 2
Urtica dioica 1

Phalaris arundinacea 4
Urtica dioica 2
Ambrosia trifida 2
Allaria petiolata 1

Urtica dioica 5
Allaria petiolata 3
Ambrosia trifida 2
Phalaris arundinacea 2

Phalaris arundinacea 2

Allaria petiolata 4
Ambrosia trifida 3
Phalaris arundinacea 2

Urtica dioica 5
Allaria petiolata 3
Ambrosia trifida 2
Phalaris arundinacea 2

Ambrosia trifida 5 (Mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 4
Urtica dioica 3
Ambrosia trifida 2
Allaria petiolata 2

Phalaris arundinacea 1

Phalaris arundinacea 2

Ambrosia trifida 4 (mixed with willow (not mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phalaris arundinacea 3
Urtica dioica 3
Allaria petiolata 2
Ambrosia trifida 2

Ambrosia trifida 5 (mowed)
Phalaris arundinacea 2
Allaria petiolata 1

Phragmites australis 1
Phalaris arundinacea 1

Phalaris arundinacea 2

Phalaris arundinacea 3
Allaria petiolata 2
Ambrosia trifida 2
Urtica dioica 2

Phalaris arundinacea 4
Urtica dioica 3
Allaria petiolata 2
Ambrosia trifida 2

Phalaris arundinacea 4
Urtica dioica 3
Ambrosia trifida 2
Allaria petiolata 2

Allaria petiolata 3
Phalaris arundinacea 2
Ambrosia trifida 2
Urtica dioica 2

Ambrosia trifida 5
Phalaris arundinacea 2
Allaria petiolata 1

Allaria petiolata 4

Ambrosia trifida 4
Phalaris arundinacea 3
Urtica dioica 3
Allaria petiolata 2

Ambrosia trifida 4
Phalaris arundinacea 3
Allaria petiolata 2
Urtica dioica 2

Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

FIGURE 2

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site - Invasive Species Monitoring & Maintenance
WISDOT Project #100-30-90
REL Project #15107067
Town of Burlington, Racine County, WI

DATE: 6/16/2017
15107067
DRAWN: PFO

Legend
Project Area (+/- 40.25 Acres)
Invasive Species Area Boundary (cover class indicated by number after species name)

0 60 120 Feet
N

Source: Robert E. Lee & Associates, Inc.
ESRI, Racine County

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Robert E. Lee & Associates, Inc.
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1250 Centennial Centre Boulevard, Hobart, WI 54155
Phone: (920) 662-9641 FAX: (920) 662-9141
www.releeinc.com

H:\NES GIS\Jobs\15107 - WI Department of Transportation - Central\15107067 - Baumeister 2017\Maps\Invasive Species Layout.mxd

2018 ANNUAL VEGETATION MAINTENANCE REPORT

BAUMEISTER WETLAND MITIGATION SITE

Racine County

Project ID 1000-30-90

Prepared for:

Ms. Brenda Ruenger
Regional Environmental Coordinator
Wisconsin Department of Transportation
Southeast Region
141 NW Barstow Street
P.O. Box 798
Waukesha, WI 53187-0798

Prepared By:

Robert E. Lee & Associates, Inc.
Engineering • Surveying • Environmental Services

1250 Centennial Centre Boulevard
Hobart, WI 54155

December 17, 2018

Introduction

Robert E. Lee and Associates (REL) was contracted by the Wisconsin Department of Transportation (WisDOT) Southeast Region to conduct vegetation management on the Baumeister Wetland Mitigation Site in the Town of Burlington, Racine County, Wisconsin (Figure 1). Management included invasive species surveys and maintenance activities.

Monitoring & Maintenance

Invasive Species Survey

REL ecologists conducted a meander survey in May to document the presence of reed canary grass (*Phalaris arundinacea*) and garlic mustard (*Allaria petiolata*). Identified populations of invasive species were surveyed with a Trimble GPS (sub-meter accuracy) unit and their percent coverage estimated (Figures 2 & 3). Coverage was determined using the perpendicular projection to the ground from the outline of the aerial parts of the plant species and reported as the percent of the total area (e.g., substrate or water surface) covered. The Daubenmire methodology was then utilized to rank estimated foliage cover based on the percentages found in Table 1. By providing a range of percent foliage cover for each rank, the Daubenmire Classification Scheme helps minimize errors due to observer bias, visual estimation, etc.

Table 1. Daubenmire Classification Scheme Cover Ranking System.

Percent Foliage Cover	Rank
0-5	1
5-25	2
25-50	3
50-75	4
75-95	5
95-100	6

Populations are depicted as polygons and points. Points represent single or few plants ($\leq$ 20 stems) having little areal coverage, while polygons depict larger populations. An approximate areal coverage for larger populations, utilizing the method above, has been included on the map.

In September, REL ecologists completed a similar survey to identify populations of giant reed grass (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*). Areal coverage was not assigned since only one small population of each species was located and mapped (Figure 2).

Maintenance Activities

Prior to conducting any herbicide applications over water at the site, an Aquatic Plant Management permit for the chemical application was secured from the Wisconsin Department of Natural Resources (WDNR). REL staff applied herbicide to control reed canary grass, common reed and garlic mustard within the site. Table 2 summarizes the date of visits, chemicals and rate used, species targeted, whether or not an aquatic permit was necessary for the application and activities conducted. A Garmin® GPSMAP® 64s GPS unit

was used to record track logs of areas covered during herbicide applications throughout the growing season (Figures 2 & 3).

Table 2. Maintenance activities completed throughout the field season.

Date	Herbicide	Application Rate (oz/gal)	Raw Amount Used (oz)	Target Species	Aquatic	Task
5/10/2018	Aquaneat®	3	75	Garlic Mustard	No	Foliar (Spot)
5/23/2018	Aquaneat®	2	72	Garlic Mustard	No	Foliar (Spot)
6/13/2018	Aquaneat®	2	20	Reed Canary Grass	Yes	Foliar (Spot)
6/14/2018	Aquaneat®	2	18	Reed Canary Grass	Yes	Foliar (Spot)
9/26/2018	Aquaneat®	2	68	Reed Canary Grass	No	Foliar (Spot)
9/26/2018	Aquaneat®	6.4	64	Common Reed	No	Foliar (Spot)
10/29/2018	Aquaneat®	2	90	Garlic Mustard	No	Foliar (Spot)

All chemical applications during the 2018 growing season were conducted using AquaNeat®, (active ingredient: glyphosate) with Methylated Seed Oil (MSO) as a surfactant, and Hi-Light Blue as a marking dye. All conditions including container disposal and wearing the appropriate Personal Protective Equipment (PPE) listed on the chemical labels were followed.

Applications did not occur if:

- Winds >15 mph
- Vegetation was wet
- Rain was expected within two hours of treatment
- Temperature inversions were possible

Herbicide signs denoting a chemical application had occurred were posted around the site before each treatment and herbicide records were completed and submitted to WisDOT within 30 days after treatment and to the WDNR for aquatic applications.

Conclusions & Recommendations

REL recommends treating garlic mustard early in the spring of 2019. Continued control of reed canary grass should be performed in areas where the density is low and control can be efficiently performed without forming large dead areas. Follow-up treatment on common reed and purple loosestrife should also be performed.



Photo 1 – North end of mitigation site facing southeast, viewing scattered reed canary grass (6/13/18).



Photo 2 – **North end of mitigation site facing east, viewing scattered reed canary grass (6/13/18).**



Photo 3 – South end of mitigation site facing southeast, viewing scattered Phragmites (6/13/18).



Photo 4 – Garlic mustard treatment on south end of mitigation site (5/23/18).

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 1
Site Location

12/11/2018

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
REL Project No. 15107085
Town of Burlington
Racine County, Wisconsin

Located in part of:
Section 19, T2N, R19E
Town of Burlington
Racine County
Wisconsin

N

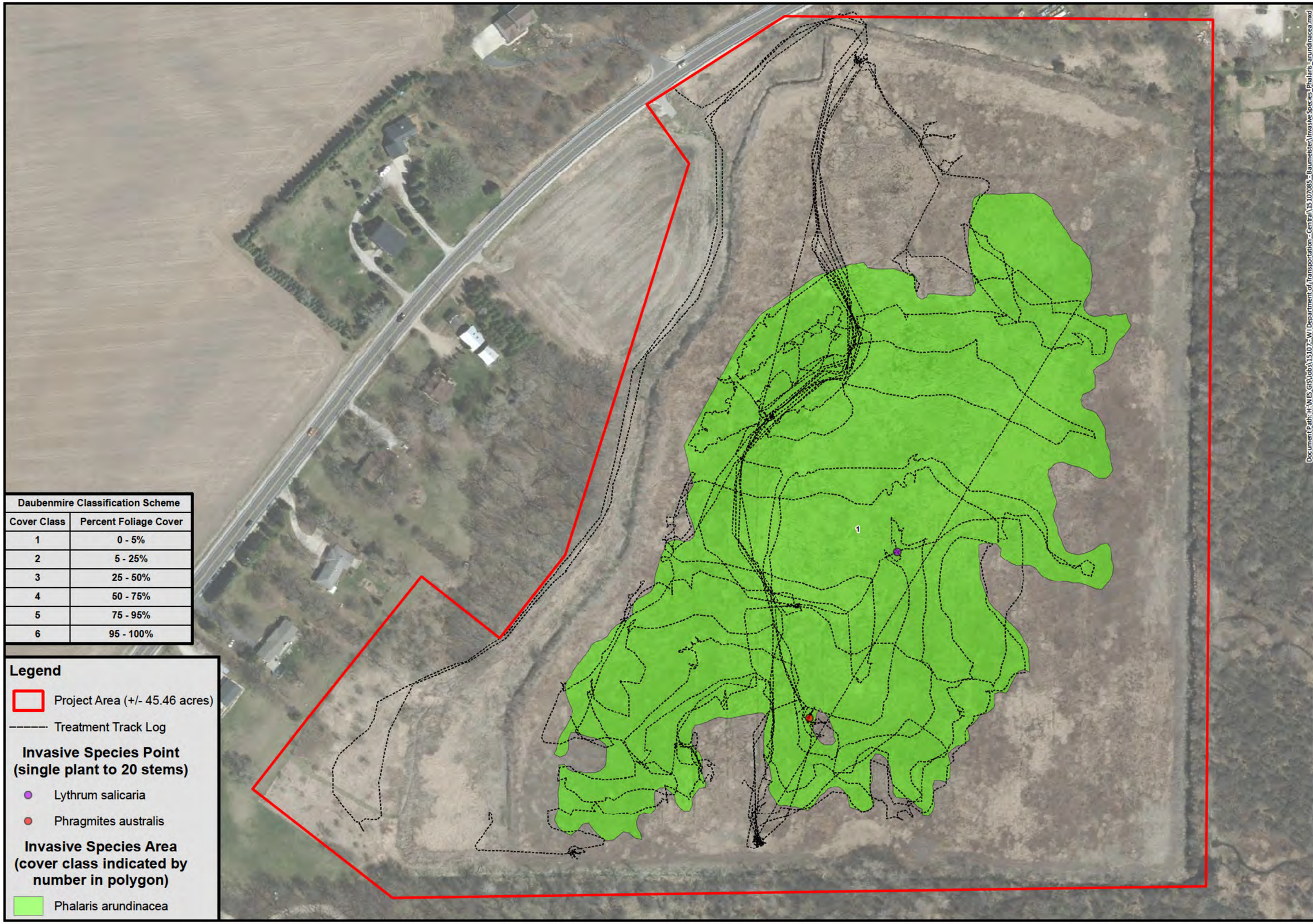
0 1,000
Feet

Extent of large data frame shown in red

Legend

Project Area (+/- 45.46 acres)

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Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

Project Area (+/- 45.46 acres)

Treatment Track Log

Invasive Species Point (single plant to 20 stems)

Lythrum salicaria

Phragmites australis

Invasive Species Area (cover class indicated by number in polygon)

Phalaris arundinacea

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 2
Invasive Species
Phalaris arundinacea, Lytrhum salicaria, & Phragmites australis

12/13/2018

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107085
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	0 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

Treatment Track Log

Project Area (+/- 45.46 acres)

Invasive Species Area (cover class indicated by number in polygon)

- Allaria petiolata (cover class 1)
- Allaria petiolata (cover class 2)
- Allaria petiolata (cover class 3)
- Allaria petiolata (cover class 4)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 3
Invasive Species
Allaria petiolata

12/11/2018

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107085
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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2019 ANNUAL VEGETATION MAINTENANCE REPORT

BAUMEISTER WETLAND MITIGATION SITE

Racine County

Project ID 1000-30-90

Prepared for:

Mr. Timothy McElmeel
Regional Environmental Coordinator
Wisconsin Department of Transportation
Southeast Region
141 NW Barstow Street
P.O. Box 798
Waukesha, WI 53187-0798

Prepared By:

Robert E. Lee & Associates, Inc.
Engineering • Surveying • Environmental Services

1250 Centennial Centre Boulevard
Hobart, WI 54155

December 18, 2019

Introduction

Robert E. Lee and Associates (REL) was contracted by the Wisconsin Department of Transportation (WisDOT) Southeast Region to conduct vegetation management and restoration activities on the Baumeister Wetland Mitigation Site (herein referred to as the Site) in the Town of Burlington, Racine County, Wisconsin (Figure 1). Management included invasive species surveys, maintenance activities and native seeding within a portion of the upland buffer.

Monitoring & Maintenance

Invasive Species Survey

REL ecologists conducted meander surveys in May and June to document the presence of garlic mustard (*Allaria petiolata*) and reed canary grass (*Phalaris arundinacea*) within a portion of the Site, respectively. Identified populations of invasive species were surveyed with a Trimble GPS (sub-meter accuracy) unit and their percent coverage estimated (Figures 2 & 3). Coverage was determined using the perpendicular projection to the ground from the outline of the aerial parts of the plant species and reported as the percent of the total area (e.g., substrate or water surface) covered. The Daubenmire methodology was then utilized to rank estimated foliage cover based on the percentages found in Table 1. By providing a range of percent foliage cover for each rank, the Daubenmire Classification Scheme helps minimize errors due to observer bias, visual estimation, etc.

Table 1. Daubenmire Classification Scheme Cover Ranking System.

Percent Foliage Cover	Rank
1-5	1
5-25	2
25-50	3
50-75	4
75-95	5
95-100	6

Populations are depicted as polygons and points. Points represent single or few plants ($\leq$ 20 stems) having little areal coverage, while polygons depict larger populations. An approximate areal coverage for larger populations, utilizing the method above, has been included on the map.

In August, REL ecologists completed a similar survey to identify populations of common reed grass (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*). Areal coverage was not assigned since only a few scattered stems of *Phragmites* and one individual purple loosestrife plant was identified (Figure 3). These locations are the same as in 2018.

Maintenance Activities

Prior to conducting any herbicide applications over water at the site, an Aquatic Plant Management permit for the chemical application was secured from the Wisconsin Department of Natural Resources (WDNR). REL staff applied herbicide to control targeted species including reed canary grass, common reed and garlic mustard within the Site. Small populations or single plants of other invasive species such as thistle

(*Cirsium spp*.), burdock (*Arctium minus*) and non-native cattail (*Typha spp*.) were also treated during control efforts focusing on the aforementioned targeted species. Table 2 summarizes the date of visits, chemicals and rate used, species targeted, whether or not an aquatic permit was necessary for the application and activities conducted. A Garmin® GPSMAP® 64s GPS unit was used to record track logs of areas covered during herbicide applications throughout the growing season (Figures 2 & 3). In addition to the herbicide applications, a patch of giant ragweed (*Ambrosia trifida)* was mowed with brush saws prior to seed development along the southern property boundary.

Table 2. Maintenance activities completed throughout the field season.

Date	Herbicide	Application Rate (oz/gal)	Raw Amount Used (oz)	Target Species	Aquatic	Task
5/15/2019	Aquaneat®	2	330	GM	No	Foliar (Spot)
6/11/2019	Aquaneat®	2	200	GM, RCG	No	Foliar (Spot)
6/11/2019	Aquaneat®	2	40	RCG	Yes	Foliar (Spot)
6/11/2019	--	--	--	--	--	Cover Crop Seeding
7/2/2019	Aquaneat®	2	5	GM, RCG, T, B	No	Foliar (Spot)
7/2/2019	Aquaneat®	2	5	RCG, HC	Yes	Foliar (Spot)
8/5/2019	Aquaneat®	2	10	RCG, PL, T, CR	No	Foliar (Spot)
8/14/2019	--			GR		Spot Mowing
10/9/2019	Aquaneat®	2	6	GM, RCG, T, B	No	Foliar (Spot)
10/9/2019	Aquaneat®	2	12	RCG	Yes	Foliar (Spot)
10/29/2019	Aquaneat®	4	100	GM, RCG	No	Foliar (Spot)
11/5/2019	--	--	--	--	--	Native Seeding

GM = Garlic Mustard RCG = Reed Canary Grass PL = Purple Loosestrife HC = Hybrid Cattail
B = Burdock T = Thistle CR = Common Reed GR = Giant Ragweed

All chemical applications during the 2019 growing season were conducted using AquaNeat®, (active ingredient: glyphosate) with Methylated Seed Oil (MSO) as a surfactant, and Hi-Light Blue as a marking dye. All conditions including container disposal and wearing the appropriate Personal Protective Equipment (PPE) listed on the chemical labels were followed.

Applications did not occur if:

- Winds >15 mph
- Vegetation was wet
- Rain was expected within two hours of treatment
- Temperature inversions were possible

Herbicide signs denoting a chemical application had occurred were posted around the site before each treatment and herbicide records were completed and submitted to WisDOT within 30 days after treatment and to the WDNR for aquatic applications.

Upland Buffer Restoration

In March 2018, REL alerted WisDOT of an encroachment issue along the western boundary of the Site. An adjacent landowner was actively farming a portion of the upland buffer within the wetland mitigation project area (Figure 4). WisDOT staff contacted the landowner requesting they stop utilizing the area and the farmer complied. New property boundary stakes were installed to delineate the boundary and reduce future encroachment issues. Due to the disturbance from agricultural activities, the previously seeded native vegetation within the upland buffer was no longer present. Since the site had been cropped and weeds actively managed, the approximate 1-acre site was seeded with a cover crop in June 2019 and spot herbicide applications were conducted throughout the remainder of the growing season to assist with site preparation for re-seeding in the fall of 2019.

Prior to seeding, REL mowed the existing vegetation and lightly worked the soil to a depth of ¼" – ½" in depth with a disc and harrow on November 5, 2019. The native seed (Table 3) was dormant sown via hand and Brillion seeder. Due to the flat nature of the site, erosion control was not installed.

The native seed application rate was based on applying 60-100 seed per square foot or 4,046,000 seeds per acre. The quantity of seed required for the planting was based on purchasing "Pure Live Seed (PLS)". The below criteria regarding seed was also followed:

1) All native seed stock will be wild ecotype indigenous to Wisconsin or have natural origins within a 250 mile radius of the intended planting site.
2) Grasses classified as "Agricultural Grasses" will be PLS as specified. Other seed will be "clean" according to high quality industry standards.
3) Seed will not be more than one year old at time of seeding.

Table 3. Seed mix used for upland buffer restoration.

Common Name	Scientific Name	Total Seed For Upland Buffer Restoration (oz.)
Big Bluestem	*Andropogon gerardii*	45.5
Canada Wild Rye*	*Elymus canadensis*	35.0
Switch Grass	*Panicum virgatum*	26.0
Indian Grass	*Sorghastrum natans*	37.9
Purple Prairie Clover	*Dalea purpurea*	11.9
Showy Tick Trefoil	*Desmodium canadense*	4.0
Pale Purple Coneflower	*Echinacea pallida*	3.9
Rattle Snake Master	*Eryngium yuccifolium*	3.6
Ox-eye	*Heliopsis helianthoides*	12.4
Wild Bergamot	*Monarda fistulosa*	3.2
Smooth Penstemon	*Penstemon digitalis*	1.7
Yellow coneflower	*Ratibida pinnata*	4.8
Black-eyed Susan	*Rudbeckia hirta*	3.6
Brown-eyed Susan	*Rudbeckia triloba*	1.6
Compass Plant	*Silphium laciniatum*	2.7
Cup Plant	*Siphium perfoliatum*	1.6
Prairie Dock	*Silphium terebinthinaceum*	2.2
Heath Aster	*Symphyotrichum ericoides*	0.6
New England Aster	*Symphyotrichum novae-angliae*	0.8
Golden Alexanders	*Zizia aurea*	6.1
	TOTAL	**209.1**

Conclusions & Recommendations

REL recommends treating garlic mustard early in the spring of 2020. Continued control of reed canary grass should be performed in areas where the density is low and control can be efficiently performed without forming large dead areas. Follow-up treatment on common reed and purple loosestrife should also be performed, if needed.

The upland buffer restoration area will need to be monitored closely in its early stages of development. This zone will likely need to be spot mowed and treated two to three times in 2020 due to an influx of weed species as the area develops and native species become established. This is a common response and action that follows killing off and reworking & seeding an area.



Photo 1 – Garlic mustard treatment (5/15/19).



Photo 2 – REL staff conducting garlic mustard treatment (5/15/19).



Photo 3 – REL staff hand pulling garlic mustard along southern property boundary (5/15/19).



Photo 4 – Reed canary grass treatment (6/11/19).



Photo 5 – Reed canary grass treatment (6/11/19).



Photo 6 – Prepping soil for cover crop seeding (6/11/19).



Photo 7 – Cover crop green-up (6/27/19).



Photo 8 – Site prep for native seeding (11/5/19).



Photo 9 – Native seeding (11/5/19).

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 1
Site Location

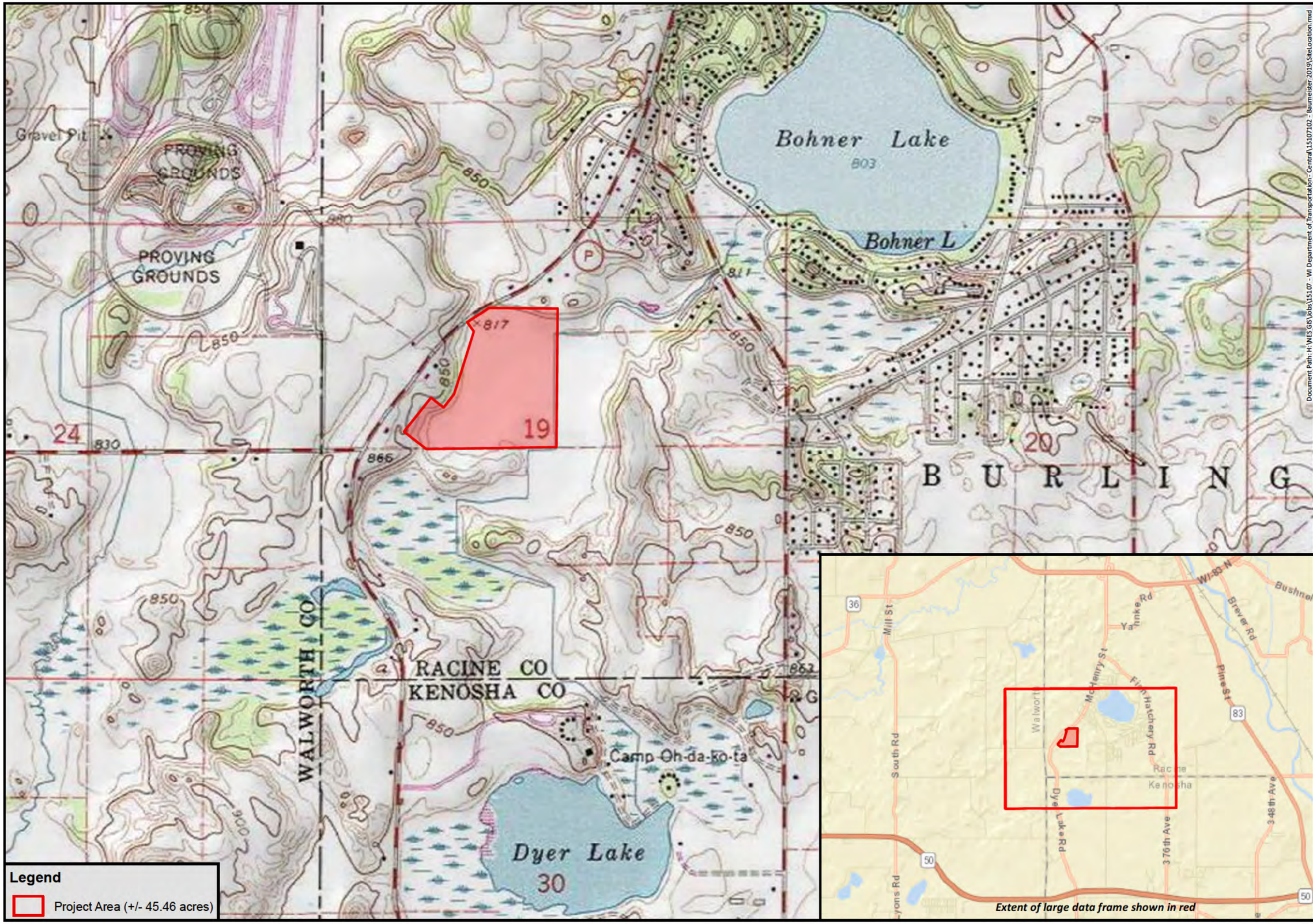
12/2/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Located in part of:
Section 19, T2N, R19E
Town of Burlington
Racine County
Wisconsin

N

0 1,000
Feet



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Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	1 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

- Project Area (+/- 45.46 acres)
- Trimble Treatment Tracks
- Garmin Treatment Tracks

Invasive Species Point (Single Plant to 20 Stems)

- Allaria petiolata

Invasive Species Area - All Unshaded Areas Equal <1% Cover)

- Allaria petiolata (cover class 1)
- Allaria petiolata (cover class 2)
- Allaria petiolata (cover class 3)
- Allaria petiolata (cover class 4)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 2
Invasive Species
Allaria petiolata

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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Daubenmire Classification Scheme	
Cover Class	Percent Foliage Cover
1	1 - 5%
2	5 - 25%
3	25 - 50%
4	50 - 75%
5	75 - 95%
6	95 - 100%

Legend

- Project Area (+/- 45.46 acres)
- Garmin Treatment Tracks
- Trimble Treatment Tracks

Invasive Species Point
(Single Plant to 20 Stems)

- Lythrum salicaria
- Phragmites australis

Cover Class

- Phalaris arundinacea (cover class 1)
- Phalaris arundinacea (cover class 3)

Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 3
Invasive Species
Phalaris arundinacea
Lythrum salicaria
Phragmites australis

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Figure 4
Upland Buffer Restoration

12/18/2019

Wisconsin Department of Transportation
Baumeister Wetland Mitigation Site
WisDOT Project #100-30-90
REL Project No. 15107102
Town of Burlington
Racine County, Wisconsin

Sources: Robert E. Lee & Associates, Inc., Racine County

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Appendix I | Land Covenants

Amended Restrictive Covenants

Whereas, by means of a document entitled Restrictive Covenants dated August 7, 2012 and recorded August 9, 2012 in the office of the Racine County Register of Deeds as Document #2326318, the Wisconsin Department of Transportation imposed certain covenants on the following described real estate located in the Town of Burlington, Racine County, Wisconsin:

That part of the Northwest 1/4 of Section 19, Township 2 North, Range 19 East, in the Town of Burlington, Racine County, state of Wisconsin described as follows:

NAME AND RETURN ADDRESS:

002 02 19 19 011 010

Parcel Identification Number (PIN)

Commence at the North 1/4 corner of said Section 19; run thence South 0° 58' 36" East 1,040.91 feet along the north-south 1/4 line of said Section to the point of beginning; continue thence South 0° 58' 36" East 1,586.91 feet along the north-south 1/4 line of said to the Center of said Section; thence South 87° 43' 45" West 1,490.33 feet along the east-west 1/4 line of said Section; thence North 53° 35' 29" West 324.77 feet to an iron pipe stake; thence North 36° 35' 23" East 166.79 feet to an iron pipe stake; thence North 37° 13' 50" East 330.79 feet; thence South 53° 05' 57" East 182.78 feet to an iron pipe stake; thence North 36° 44' 40" East 194.52 feet to an iron pipe stake; thence North 16° 06' 15" East 317.79 feet to an iron pipe stake; thence North 16° 06' 15" East 433.69 feet; thence North 37° 00' 00" West 133.00 feet to the center line of C.T.H. P; thence Northeasterly along said centerline 300.00 feet to a north property line of the owner; thence North 89° 01' 24" East 784.77 feet along said property line to the point of beginning. This parcel contains 45.23 acres, more or less, exclusive of lands previously conveyed or dedicated for highway purposes.

Whereas, the Wisconsin Department of Transportation intends by this document to amend the recorded covenants affecting the above described property;

Now, therefore, the Restrictive Covenants dated August 7, 2012 and recorded August 9, 2012 in the office of the Racine County Register of Deeds as Document #2326318 affecting the above-described real estate are hereby amended to provide as follows:

Access and Inspection. The Wisconsin Department of Transportation (DOT), its contractors, agents and invitees; the Wisconsin Department of Natural Resources (DNR); and the Army Corps of Engineers (COE) shall have the right to enter the Wetland Mitigation Site, in a reasonable manner and at reasonable times, for the purpose of inspecting the Wetland Restoration Site which serves as Mitigation for the Burlington Bypass, to determine if any successor or assigns is complying with the conservation covenants listed below.

The representatives of the above named entities shall have the further right to observe, study, record, make scientific studies and educational observations, and to allow for a harvest of common wetland plant seed and root stock (not including state and federal listed threatened and endangered species) for replanting on the Wetland Mitigation Site and other DOT wetland restoration sites or projects if the activity does not threaten the long term establishment and density of native vegetation and seed bank.

Covenants. The following restrictive conservation covenants shall run with the land and bind the

Wetland Mitigation site in perpetuity. These covenants apply to restoration and non-restoration acreage within the legal description and include, but are not limited to, upland prairie buffers, stream banks, existing wetlands, and wetland restoration acreage.

Uses. There shall be no commercial, industrial, residential or other incompatible activities undertaken or allowed within the Wetland Mitigation Site.

Buildings and Structures. There shall be no buildings, dwellings, barns, roads advertising signs, billboards or other structures built or placed in the Wetland Mitigation Site or in trees, provided, however, that structures essential to maintaining the site or structures, such as interpretive signs or other additions that enhance the public's use of the site, can be installed with written approval from the Corps of Engineers.

Topography. There shall be no dredging, filling, excavating, mining, drilling or removal of any topsoil, sand, gravel, rock, minerals or other materials within the restored Wetland Mitigation Site or in adjacent on-site areas that affect the site. There shall be no plowing or any other activity that would alter the topography of the Wetland Mitigation Site. There shall be no activities undertaken that could threaten or jeopardize the stability or integrity of the planned vegetative zones or slopes.

Dumping or disposal. There shall be no dumping of trash, ashes, garbage or other unsightly or offensive material, including any hazardous or toxic waste. Nor shall there be dumping or depositing of other materials including topsoil if such action would alter the topography, hydrology or planned/established vegetative communities of the Wetland Mitigation Site.

Water. The hydrology of the Wetland Mitigation Site will not be altered in any way that would effectively drain the site or by any means including pumping, draining, diking, impounding or diverting surface or ground water out of the Wetland Mitigation Site except as approved by the Corps of Engineers for the purpose of protecting or maintaining the site's wetland status.

Agricultural Uses. No removal of developing native vegetation, plowing, tilling, brushing, cultivating, crop planting or other agricultural activities may take place within the Wetland Mitigation Site except as may be reasonably required for the management of invasive species or the preservation or maintenance, or enhancement of existing planned vegetative zones, slopes, buffers and stream banks.

Motorized vehicles and watercraft prohibited. There shall be no operation of any motorized vehicles, watercraft, or equipment within the Wetland Mitigation Site, including but not limited to all terrain vehicles, motorcycles, snowmobiles, golf carts, or boats with electric or gas motors. Notwithstanding the foregoing, motorized vehicle operation is permitted as may be reasonably necessary for the management of invasive species or the preservation or maintenance of existing planned vegetative zones, slopes, buffers and stream banks upon twenty (20) days advance written notice to the Corps of Engineers which shall have ten (10) days following receipt of such notice within which to object, in writing, to the proposed motorized vehicle operation.

Vegetation. There shall be no removal, cutting, mowing or alteration of any vegetation or change in the natural habitat in any manner, except that any successors or assigns of the property may, but are not required to, take such steps necessary to remove non-native species, manage wildlife, control noxious weeds, or otherwise maintain the property in a natural state as described in the most recent vegetation survey which shall be prepared prior to any transfer of title.

Enforcement of covenants. Any actions taken by any DOT successor or assign which violate these covenants shall entitle the Corps of Engineers to enter upon the property with respect to which said violation exists and remove, at the expense of the any successor or assigns, owner, lessee or occupant thereof, any structure or condition that may exist which violates the covenants. No lease may be assigned nor any

successor or any new easements granted within the Wetland Mitigation Site without written approval from the Corps of Engineers.

The Wetland Mitigation Sites referred above in these covenants is the 45.23 acres of land more or less, legally described on page 1 of this document.

These conservation covenants and restrictions shall run with and burden the Wetland Mitigation Site in perpetuity and shall bind the any grantees and their heirs, successors, and assigns or lessee.

Executed as of this ____ day of _____, 2020.

Wisconsin Department of Transportation

By: _____

ACKNOWLEDGMENT

STATE OF WISCONSIN)
) ss.
WAUKESHA COUNTY)

Personally came before me this _____ day of _____, 2020, the above named _____, to me known to be the person who executed the foregoing instrument and acknowledge the same.

_____

Notary Public, State of Wisconsin
My commission is permanent.

This instrument drafted by:
Richard Scholze
Wanasek, Scholze, Ludwig, Ekes & Gorn, SC
Burlington, Wisconsin