

12-9-2021

The City of Fitchburg
Urban Service Area Application

For:

Edgewood College
Athletic and Wellness Campus Development



Prepared by: Rettler Corporation
Project Number: 18.083
December 9, 2021



Urban Service Area Application

December 9, 2021

New Athletic and Wellness Campus
Edgewood College
Fitchburg, Wisconsin

Project Number: 18.083

Submitted By: City of Fitchburg, Wisconsin

For: Edgewood College

Architect/Engineer: Rettler Corporation
Stevens Point, Wisconsin
(715) 341-2633

TABLE OF CONTENTS

Introduction:	3
Plan Consistency and Need:.....	3
Intergovernmental Cooperation:	5
Land Use:.....	5
Natural Resources:.....	5
Utilities and Stormwater Management:.....	6

ATTACHMENTS:

Letters of Support

Development Plan:

Wetland Delineation:

Geotechnical Report:

City of Fitchburg Water Utility System Map:

City of Fitchburg Sanitary Utility System Map:

Traffic Analysis memo:

Introduction:

The City of Fitchburg is requesting an Urban Service Area (USA) amendment to add approximately 42 acres of land south of Lady Road, and immediately west of the Badger State Trail. The subject parcel is part of the North Stoner Prairie Neighborhood. The amendment area will be referred to as the Edgewood College Athletic and Wellness Campus (campus), which is comprised of Lot 2 of Plat of Survey for O'Brien Flats. (Plat of Survey number from City of Fitchburg, and the State of Wisconsin).

The site topography generally falls from west to east with wetlands centrally located on the east side. A majority of the site is existing agricultural fields with emergent/wet meadow wetlands taking up a large portion of the east half of the site. The existing zoning for the entire project site is classified by the City of Fitchburg as Exclusive Agriculture on the City of Fitchburg Official Zoning Map. The proposed land use is G/I Government / Institutional Use in the City of Fitchburg Comprehensive Future Land Use Plan.

Plan Consistency and Need:

The Edgewood College Athletic and Wellness Campus development is consistent with the community's comprehensive plan for the following reasons:

- Creates a use transition buffer on the edge of the urban development and agricultural uses within the City of Fitchburg. This buffer provides a transition from exclusive agriculture open space uses to the more intense general industrial, specialized industrial, general business, medium density residential, and low density residential uses to the north and east of the subject property.
 - The city has not developed/adopted a general policy for use transition buffers. Although over the years the city has taken some action to further the idea of transition buffers. One example is the Moraine Edge Park concept (see the Parks, Open Space & Recreation Plan), which would establish a "green belt" of sorts. Additionally, the City's Agriculture Plan (2017) does provide general policy direction that encourages strategic agricultural land preservation and "up valuing" ag land, so as to help guide the pattern and pace of urban development. A policy initiative identified in said plan and recently implemented was amendment to the Zoning Ordinance which allows for more agricultural-based businesses such as rural event venues and on-farm processing and retail.
- The proposed development is consistent with surrounding land uses. The proposed development is primarily open space, athletic fields, stormwater ponds, and wetland restoration areas. The surrounding uses are open agricultural field spaces and homesteads. The architectural theme of the proposed development blends with the agricultural vernacular of the region. Architectural elements are minimized for support uses to the open spaces.
- Traffic, noise, and lighting will not create a nuisance to surrounding land uses.
 - Traffic will fall within the Lacy Road Intersection Design Report traffic study dated June 17, 2021 and subsequent Edgewood College Campus Driveways and Circulation memo, attached.
 - The Lacy Road reconstruction project plans to include a median refuge island and likely an RRFB at the Badger St Trail Crossing at Lacy Rd. Further design and discussion with DNR staff is needed before a final treatment is defined.

- Currently a single lane roundabout at Seminole & Lacy is being design for construction in 2022. The Lacy & Fitchrona Rd intersection is planned for design in 2023 and construction in 2025. Intersection improvement options include added auxiliary lanes, all-way stop, single lane roundabout, or traffic signal.
 - The Lacy Rd reconstruction project will include a north side 10' shared use path and buffered bike lanes. The south side sidewalk will not be constructed with the project, but will be required as properties develop.
 - Sound technology will use state of the art equipment for internal focused sound.
 - Site lighting will use LED technology and will be dark sky compliant
- The development fills in the gap between wetlands areas on Lacy Road, and again provides a buffer transition between future potential neighborhood areas, and more intense use areas to the north.
- Critical link in the stormwater management conveyance within the Sugar River watershed. Creates a stormwater “relief valve” in the region where stormwater is a concern.

The property is in the North Stoner Prairie Neighborhood, and the neighborhood plan can be viewed at the following website link: <https://www.fitchburgwi.gov/468/North-Stoner-Prairie-Neighborhood-Plan>

The current Edgewood College main campus located on Monroe Street in Madison no longer has the capacity for building expansion. In addition, Edgewood College’s commitment to environmental sustainability make further campus massing inconsistent with college planning. Due to these facts, Edgewood College has searched for an alternative site to become an Athletic and Wellness Campus. Over 12 years, Edgewood College utilized the services (pro bono) of a commercial real estate agent in hopes of finding a west-side parcel of property suitable for the building of an Athletic and Wellness Campus. Though many properties were discovered, none were suitable for the following reasons:

- Not enough contiguous acreage
- Previous uses created hazards for development
- Property Owners’ designated uses were for housing or commercial

The O’Brien property was the first property that met the size needs, location, and potential for open-field development. It’s location off the Badger State Trail Bike Path is ideal for access from our Monroe Street Campus. The ability to keep all campus elements in one place, allows for less building and structures. This location has far less impact on neighborhoods and future development than others researched. Lastly, the proposed use fits with the vision of the current landowners. – Edgewood College

With the addition of the subject property to the USA, the Edgewood College Athletic and Wellness Campus will provide recreation opportunities and will enhance and preserve open space natural areas in a growing area of the City of Fitchburg. Trails and connections will be included on the property, parking areas and a kiosk will be available for trailhead access to the Badger State Trail. The proposed facilities will benefit the local and regional communities. Hosted events will increase local hotel use and other commercial uses benefiting the local and regional economies.

The proposed USA Amendment is consistent with the City’s Comprehensive Plan.

Intergovernmental Cooperation:

The subject property is within and surrounded by lands within the political boundaries of the City of Fitchburg. There are no intergovernmental agreements that affect the proposed development.

Land Use:

The current land use is exclusive agriculture. The proposed land use G/I Government / Institutional Use and is a mix of open space (environmental corridors) and institutional use for the Edgewood College Athletic and Wellness Campus. This open space campus provides a clear transition between the general industrial, specialized industrial, general business, medium density residential, and low density residential zoning areas north of Lacy Road, to the exclusive agricultural areas south of Lacy Road. The campus will consist of collegiate level synthetic turf baseball field and synthetic turf softball field, a competition track venue with rubberized surfacing, synthetic turf soccer field on track interior, jumping (long/triple jump, high jump) and throwing events (discus, hammer throw, javelin, and shot put), six outdoor tennis courts, and an indoor support and training facility with bathrooms, locker rooms, office space, and indoor synthetic turf training space. All fields will be lighted for night use.

The land falls within the Urban Growth Boundary on the Urban Development Boundary Map ratified March 10, 2020.

Table 1: USA Amendment Area Data				
	Number of Acres			Number of
Proposed	Total	Existing	Environmental	Housing
Land Use	Area	Development	Corridor	Units
Single Family Residential	0	0		
Other Type Residential	0	0		
Residential Total	0	0		
Commercial	0	0		
Industrial	0	0		
Institutional	24.0	0		
Street R-O-W	0	0		
Parks	0	0		
Stormwater Management	1.3	0	1.3	
Other Open Space	15.5	0	15.5	
TOTAL	40.8	0	16.8	0

Natural Resources:

A Geotechnical Engineering Report was prepared by ECS Midwest, LLC in March 15, 2019. Eleven borings were drilled to a depth of 15 feet, the general soil profile is roughly 5 to 18 inches of topsoil, on 2.5 to 7.5 feet of lean clay, followed by 2.5 to 8 feet of sandy lean clay with silt, all on glacial outwash consisting of sand and sand with clay and silt to a depth of 15 feet. Borings also indicated that groundwater could be encountered at a depth of 3 to 10 feet below existing grade. A copy of the Geotechnical Engineering Report has been included for reference. The Plat of Survey has identified a

glacial kettle overflow area elevation of 1020'. No structural development will be allowed within 2 vertical feet of the overflow route of the depression.

A Wetland Delineation Report was prepared for Rettler Corporation by NES Ecological Services on June 12, 2019. It was determined that two of the five soils found on site are considered Wisconsin wetland indicator soils, meaning their drainage class ranges from somewhat poorly to very poorly drained. Wetland boundaries were determined by assessing vegetation, soil types, and hydrology of the area. It was found that a wetland is centrally located on the east side of the site. A copy of the Wetland Delineation Report has been included for reference.

The existing wetlands are a low-quality farmed wetland. This area is planned to be restored to a native wetland through wetland scrapes, grading, soil preparation and native restorative plantings. This area will serve as an outdoor laboratory for Edgewood College and be open for public enjoyment, recreation, and education. The wetland enhancement will provide much needed habitat for native flora and fauna and provide a resilient urban oasis for pollinator species.

No public outlots will be created for parks or stormwater management facilities, however, outdoor opportunities will be open to the public for passive recreation and to access the wetland and stormwater pond environmental areas.

The existing wetlands are planned to be enhanced for environmental education purposes. Both the stormwater management pond area and existing wetlands will be designated as environmental corridors and are shown on the proposed development plan. The proposal will meet the criteria for the Environmental Corridors requirement.

Utilities and Stormwater Management:

Sanitary Sewer: The proposed 8" sanitary sewer stub will serve the proposed support building in the center of the west boundary of the athletic and wellness campus. The proposed 8" sanitary sewer stub will have an invert of roughly 1016' at the southern Lacy Road ROW limit. The municipal sanitary sewer stub depth will allow for a 515' long 8" diameter private gravity sanitary sewer with 1.04% slope to serve the proposed support building with an anticipated finish floor elevation of roughly 1027'.

- The estimated average daily and peak wastewater flow for the USAA for the development is 100 gpm (peak), 1,300 gpd (daily)

The City's 18-inch Seminole Hwy Interceptor will service the amendment area. The average daily flow in this interceptor was 79,000 gpd in 2020. This interceptor has a peak capacity of 3.64 cfs. It has been sized to service this amendment area as well as future growth areas south of this amendment area.

The Madison Metropolitan Sewerage District (MMSD) Nine Springs regional wastewater treatment plant services the City of Fitchburg and will provide wastewater treatment for development within the amendment area. Capacity information for the Nine Springs treatment plant can be obtained from Curt Sauser at (608)222-1201, ext. 269.

Water Service: The proposed 8" water service stub from Lacy Road will serve the proposed support building. The proposed development will also require fire hydrants on the interior of the site.

- The average daily and peak hourly water demand for the USAA is 260 WSFU, 204 DFU

This amendment area is located in the City's West Zone. This zone has supply capacity of 3.6 MGD and storage capacity of 1.75 MG.

The average daily demand in the West Zone in 2020 was 1.08 MGD. The max daily demand during the past 10 year in this zone was 2.31 MGD in 2012. The City uses a factor of 1.85 to calculate the average day hourly peak demand (83,250 gph) as well as max day hourly peak demand (178,300 gph). This factor is based on the hourly water usage on the max day on record in 2012.

Stormwater Management: A majority of the proposed impervious surfaces, consisting of buildings, parking lots and walkways, are located on the north half of the site with stormwater generated from these areas ultimately discharging to a wet detention basin in the northeast corner of the site. The wet detention basin will allow for the 80 percent reduction of total suspended solids (TSS) that is required by Dane County and the Wisconsin Department of Natural Resources (WDNR). Grassed swales and grassed filter strips will also aid in TSS removal. The southern half of the site, in addition to the synthetic turf baseball field on the north half, will discharge to the wetland area directly east of the proposed track and synthetic turf field, synthetic turf softball field, and tennis court facility. The wetland will provide the same benefits as the wet detention basin by allowing the removal of TSS and providing increased storage for stormwater runoff, including back-to-back 100-year storm events. The wet retention basin will overflow into the wetland via culvert during large storm events. The existing emergent/wet meadow wetland is significantly disturbed due to agricultural use per the NES wetland delineation report. The proposed development includes improving the existing wetland to a more valuable and native wetland in coordination with the WDNR and a private wetland consultant.

Stormwater runoff from parking and drives will be treated for TSS and peak reduction with a wet detention pond. Runoff within the synthetic turf athletic fields will be treated for TSS and peak reduction with the synthetic turf permeable stone system similar to a permeable pavement system. Relatively clean runoff from other areas such as roof space and greenspace with minimal TSS loading will be routed to the improved wetland. The applicable stormwater TSS reduction and peak reduction requirements of the WDNR, Dane County and City of Fitchburg will be met.

Tributary Runoff – In addition to the proposed development, a large area of land directly west generates a significant amount of tributary stormwater runoff which will be treated by the available capacity of the wetland area. Tributary runoff is predominantly generated by the area west and southwest of the project site. This tributary runoff will be encapsulated or collected in a swale and routed south near the west property line and then routed east along the southern property line. The tributary runoff is generated by agricultural areas and will need to be reviewed for potential impacts to the improved wetland in terms of chemicals and water quality. Stormwater detention or retention will be provided for tributary runoff to meet applicable stormwater ordinances.

HydroCAD Software was used to model post-development runoff rates for the 1-year, 2-year, 10-year, and 100-year, back-to-back 100 year, and 200 year 24-hour design storms. Surface types (including the addition of permeable synthetic turf surfaces), site grading, and soil conditions are entered into the program to determine the rate at which stormwater travels across the site and ultimately to the wetland. This information is also used to calculate the required volume for the sub-surface athletic field stormwater treatment and storage for the soccer, softball, and baseball fields, wet retention pond, and wetland. The proposed development will meet applicable WDNR, Dane County and City of Fitchburg

stormwater ordinances. Filling and impervious surfaces are not proposed within the existing wetland area. Dane County will require the peak runoff rate be maintained for the 200-year storm event. Preliminary engineering stormwater modeling has achieved maintaining the 200-year storm event peak runoff rate as well as retaining two back to back 100-year storm events in large part due to the improved wetland volume. The improved wetland area is proposed to provide peak reduction through its substantial storage volume for large storm events. A wet detention pond, detention within the synthetic turf athletic fields and potentially surface detention will be used for peak reduction and infiltration requirements during lesser storm events.

Modeling determined that the site has the capacity to hold runoff from the proposed development as well as the tributary area to the west. The wetland will be pre-treated by sediment removal structures outside of the wetland boundary that will overflow into the wetland area in large storm events.

Modeling Considerations – It is important to note that infiltration rates and groundwater elevations used in this model are subject to vary. Soil types determined in the geotechnical report were cross referenced with infiltration rates listed for the WDNR. Groundwater elevations are highly dependent on yearly precipitation events and change year by year. The City infiltration requirements will be met utilizing the proposed wet detention pond, detention within the synthetic turf athletic fields and the improved wetland area. Surface detention in greenspace upstream of the wetland may also be used to achieve the City infiltration requirement. Oil and grease separation for proposed parking and drives will likely occur at the outfall of the wet detention pond. The method of oil and grease removal will be dictated by the Dane County and City of Fitchburg ordinances.

Edgewood College will be responsible for the ongoing management and long-term maintenance of the stormwater facilities. A stormwater maintenance agreement will be filed with the permitting in accordance with the permit requirements.



October 19, 2021

To Whom It May Concern:

The Madison Area Sports Commission (MASC) promotes the Dane County region as a destination for sports and fitness events, competitions and tournaments. In addition, as part of our work, we support the development of quality sports venues in our region, which enrich the lives of those living in and visiting Dane County and the State of Wisconsin.

The Edgewood College Sports Complex in Fitchburg would provide multiple first-class athletic competition sites in one central area. The venues would provide the capability of servicing college, community needs and allow for opportunities to bring in events that would attract visitors and competing teams to Fitchburg, Dane County and Wisconsin. Having college facilities, the larger community can access is an incredible asset and attraction to our area. One that people would be clamoring to compete on.

The Madison Area Sports Commission has been a long-time partner of Edgewood College and they have time and time again looked for ways to support and partner with the community. Their commitment to the greater community has been a long-standing value of theirs and we have seen it play out with youth, veterans, and the general community.

The Madison Area Sports Commission (MASC) urges CARPC and others in providing Edgewood College with the support they need to help make this exciting vision come to reality.

Should this project come to fruition, the Madison Area Sports Commission stands ready to help maximize the use of the facility and help it realize the economic impact potential that a facility like this would possess.

Thank you for your consideration and, again, we strongly encourage you to support the project.

If you have any questions or wish to discuss further, please contact me.

Sincerely,



Jamie Patrick
Vice President

608-441-2621

patrick@madisonsports.org



City of Verona

Recreation Department

410 Investment Court

Verona, WI 53593

Phone: (608) 848-6815 Fax: (608) 845-5761

Email: casey.dudley@ci.verona.wi.us

October 20, 2021

To whom it may concern:

I am writing this letter in support of the future project for Edgewood College. We have had an excellent working relationship for the past twenty years. The Edgewood College Athletic Department has been a great partner in our baseball and softball field maintenance and operations. They have contributed countless man hours and financial support for our Stampfl Baseball Field.

Edgewood College has been committed to our community and has been in an agreement with the City of Verona since 2008. Within the duration of that agreement, they have been great stewards of our facilities, have assisted and worked with us on several improvements to the facility. Al Brisack has been very respectful and showed a great understanding of our planning processes throughout the past 20 years. We look forward to a continued positive working relationship with Edgewood College for the unforeseen future.

Sincerely,

Casey Dudley
Recreation Director
City of Verona



EDGEWOOD COLLEGE

ATHLETIC CAMPUS DEVELOPMENT MASTER PLAN - FITCHBURG, WI
PRELIMINARY FIELD LAYOUT - PREFERRED CONCEPT



0' 60' 120' 180'
RETTLER CORP. PROJECT # • 18.083
DATE • 06.06.2019





1250 Centennial Centre Blvd. • Hobart, WI 54155

Serving **Wisconsin, Michigan, Minnesota** and **Illinois**



Wetland Delineation Report

Parcels 225/0609-172-8501-1 & 8091-8

Prepared for

Rettler Corporation

3317 Business Park Drive

Stevens Point, WI 54481

Project No. 13485016

Authored By:

James Havel

June 12, 2019

www.NESWI.com

Table of Contents

INTRODUCTION	2
PRE-FIELD REVIEW	2
Topography	2
Past Land Uses	3
Wetland Mapping	3
Mapped Soils	3
Precipitation	4
METHODOLOGY	4
Vegetation	5
Soils	5
Hydrology	5
RESULTS	5
Site Description	5
Current Land Uses	5
Water Features/Hydrology	5
Soils	6
Plant Communities	6
Findings	6
Wetland Communities	6
CONCLUSION	16
LITERATURE CITED	17

Tables

Table 1. Mapped Soil Units within Project Area	3
Table 2. Summary of Precipitation between February and April, 2019 in Fitchburg, Wisconsin	4
Table 3. Surveyed Plant Communities	6

Appendices

Appendix A	Site Location
Appendix B	WDNR Surface Water Data Viewer & Contour Map
Appendix C	NRCS Wetland Inventory Map
Appendix D	NRCS WETS Table & Daily Data for the Arboretum UNIV WIS Station
Appendix E	NRCS Rainfall Documentation Worksheet
Appendix F	Northcentral/Northeast Supplement Wetland Delineation Data Forms
Appendix G	NRCS Remotely Sensed Data Summary
Appendix H	Delineated Wetland Map
Appendix I	NR 151 Wetland Susceptibility Classifications

INTRODUCTION

NES Ecological Services (NES) – A Division of Robert E. Lee & Associates, Inc., under contract with Rettler Corporation, conducted a wetland delineation within Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8 located in Section 17, T06N, R09E, City of Fitchburg, Dane County, Wisconsin (Appendix A). The area investigated is approximately 44.60 acres in size and contains approximately 14.77 acres (643,473 ft²) of wetland. The delineation was conducted to detect wetland resources that may be impacted during future development. Field work was conducted May 6 & 7, 2019.

NES is a natural resources firm focusing entirely on issues associated with wetlands, native habitat restoration and wildlife management. NES staffs ecologists specializing in wetlands, botany, and wildlife who are well qualified to assist individuals, companies, and municipalities with a variety of wetland services, ecological surveys, natural resource planning, and native habitat restoration projects. The wetland ecologists involved with this project are James Havel & Samantha Rock. Mr. Havel has a B.S. in Wildlife Management and Biology and a M.S. in Environmental Science, which provides him with a very strong background in natural resource sciences including wetland ecology. He has been working at NES for the past twenty years performing wetland related activities. Ms. Rock has a B.S. in Environmental Science, and a M.S. in Sustainability Science relating to Natural Resource Management and Wetland Ecology, and has several years of experience performing delineations, plant surveys and habitat surveys. Mr. Havel is a Wisconsin Department of Natural Resources (WDNR) Assured Wetland Delineator. Mr. Havel was lead field worker and report author for this project.

PRE-FIELD REVIEW

An initial review of the United States Geological Survey (USGS) Topographic Map (National Geographic Society, 2019); the Wisconsin Department of Natural Resources (WDNR) Surface Water Data Viewer (SWDV) (2019); 1-foot Dane County Contour Data; 1979-1989, 1991-2003 Farm Service Agency (FSA) Slides; 1937, 1955, 1957, 1968, 1976, 1987, 1995, 2000, 2005, 2010, 2014 and 2017 Dane County orthophotos; 2004-2006, 2008, 2010, 2013, 2015 & 2017 National Agricultural Imagery Program (NAIP) orthophotos; 2012 & 2018 Google Earth imagery; the NRCS Wetland Inventory Map (1985) and the Natural Resource Conservation Service (NRCS) Web Soil Survey (2019) was performed prior to the wetland delineation in order to gain familiarity with the site's topography, existing wetland vegetation and soils data.

Topography

The USGS topographic map (Appendix A) indicates flat elevations in the eastern parcel and the western half of the western parcel, while a contour of 1020' above mean sea level (MSL), noted as a depression, is identified in the eastern half of the western parcel. The east side of the eastern parcel borders S. Seminole Highway, while Lacy Road parallels the northern portions of the both parcels. A railroad bisects the east and west parcels. The area has no development or other features noted on the map.

The 1-foot Dane County Contour Map (Appendix B) indicates elevations within the western parcel range from a high of 1028' above MSL in the far northwest corner to a low of 1017' above MSL in the eastern half of the parcel. In general, elevations in this parcel gradually taper from west to east toward the railroad grade. A constructed berm is present along the southern project border near the east side of the parcel. Elevations within the eastern parcel range from a high of 1023' above MSL in the far northeast corner to a low of 1016' above MSL in the west central portion of the parcel adjacent to the railroad. In

general, elevations in this parcel gradually taper from east (South Seminole Highway ROW) to west toward the railroad grade.

Past Land Uses

Based on aerial photographs dating back to 1937, both project areas were in agricultural production with only a few scattered trees present along the southern edge of the western parcel. South Seminole Highway was present on the east side of the eastern parcel. By 1955 both Lacy Road (north side) and the railroad (bisects parcels) were constructed. Between 1976 and 1979, a utility substation was constructed north of the eastern parcel, while a second station was constructed north of the western parcel between 1989 and 1991. Both parcels remained in agricultural production until 2017. After that point the eastern parcel and the eastern half of the western parcel were abandoned due to wet conditions. The western half of the western parcel, however, continued to be cropped. At some point in time, the railroad corridor was converted to the Badger State recreational trail. No other changes are visible from 2018 to present day.

Wetland Mapping

Neither the WDNR SWDV Wisconsin Wetland Inventory (WWI) (Appendix B) nor the NRCS Wetland Inventory Map (Appendix C) indicates the presence of wetland within or abutting the project area.

Mapped Soils

The NRCS Web Soil Survey indicates the presence of five soil series within the site, two of which are Wisconsin wetland indicator soils (soils mapped by the USDA NRCS with a drainage class of somewhat poorly, poorly, or very poorly drained) (Table 1 and Appendix B).

Table 1. Mapped Soil Units within Project Area.

Soil Series	Hydric Inclusion*	Drainage	Percent Composition On-Site**
Elburn silt loam, gravelly substratum, 0-3% slopes (EgA)	Sable, Drummer & Mahalasville	Somewhat poorly drained	31.1%
Kegonsa silt loam, 2-6% slopes (KeB)	--	Well drained	39.3%
Plano silt loam, gravelly substratum, 0-2% slopes (PoA)	--	Well drained	5.7%
Plano silt loam, gravelly substratum, 2-6% slopes (PoB)	--	Well drained	12.8%
Radford silt loam, 0-3% slopes (RaA)	Otter, Sable, Sebewa & Drummer	Somewhat poorly drained	11.1%

* NRCS National Hydric Soils List (2019)

**Source: Calculated using NRCS Web Soil Survey website (2019)

Precipitation

Recent and historical precipitation data from the nearest weather station were examined and analyzed using the NRCS Rainfall Documentation Worksheet (weighted month method) to determine if current antecedent hydrologic conditions were considered dry, normal, or wet for the project area. The weather station referenced for this project is the University of Wisconsin (UNIV WIS) Arboretum Station.

Based on the data displayed in Table 2, February was wet, March was dry and April was normal. Data from the NRCS WETS Table for the Arboretum Station (Appendix D) and the NRCS Rainfall Documentation Worksheet (Appendix E) indicates precipitation for the three month period prior to conducting fieldwork (February-April) was considered normal. According to the Observed Daily Data for the same station (Appendix D), a total of 3.18" of precipitation were recorded in the two weeks prior to collecting data, while a total of 4.41" were recorded in the thirty days prior to collecting data on May 6 & 7, 2019 (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year.

Table 2. Summary of Precipitation between February and April, 2019 in Fitchburg, Wisconsin.

Category	February	March	April
Recorded Precipitation	3.11	1.21	3.25
Normal Range*	0.69-1.61	1.22-2.94	2.87-4.58
Condition	WET	DRY	NORMAL

Precipitation values are measured in inches

*Normal Range limits refer to a "30% chance will have less than or more than"

Source: NRCS WETS Table – Arboretum Univ WIS Station (Appendix D)

METHODOLOGY

Wetland boundaries were established based on a combination of the routine and comprehensive wetland delineation method as defined in the *Regional Supplement to the 1987 Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions* (NC/NE Supplement) (USACE ERDC, 2012).

Equipment & Materials Utilized:

- Base Maps
- Trimble Geo7X
- Panasonic FZ-G1 Toughpad
- WetForm NC/NE Supplement Data Forms
- 25-foot tape
- Soil Auger
- Sharp Shooter Spade
- Munsell Soil Color Charts (Munsell Color, 2010)

Vegetation, soils and hydrology data were collected and recorded on NC/NE Supplement Data Forms (Appendix F) at a total of sixteen sample plots. These plots were chosen based upon guidance in the NC/NE Supplement, the *2015 Guidance for Submittal of Delineation Reports to the St. Paul District USACE and the WDNR*, and because NES felt they adequately covered and characterized the subject area.

A review of FSA aerial slides (1979-1989 & 1991-2003), Google Earth Imagery (2012 & 2018) and NAIP orthophotos (2004 - 2006, 2008, 2010, 2013, 2015 and 2017) was also conducted. Appendix G contains scans of the imagery and a datasheet summarizing the interpretation of those photos.

Vegetation

At each sample plot, the percent cover for each species within the vicinity of the plot was visually estimated and recorded on the NC/NE Supplement data forms. The exception are planted agricultural crops which are noted in the remarks section, but not included in the vegetation calculations. Herbaceous, shrub & sapling, and tree & vine layers were measured within 5-foot, 15-foot and 30-foot radius plots, respectively. If no vegetation was found within the sample plot, an adjacent area with a similar landscape position, if available, was utilized. Dominant species were then determined by applying the 50/20 rule and Prevalence Index and their wetland indicator status was taken from *The National Wetland Plant List: 2016 wetland ratings* (Lichvar, 2016). After the indicators were applied, a decision regarding the dominance of hydrophytic vegetation was made.

Soils

At the sample plots, a soil pit was dug with a spade to a depth of at least 24 inches. The presence and abundance of mottling, matrix color, and texture were then recorded for each of the soils found. The Munsell Soil Color Charts were used to determine the hue, value and chroma of all soils that were observed when moist.

The profiles were also observed to determine the presence of hydric indicators that are listed in the NC/NE Supplement. The presence or absence of these indicators was then used to determine if hydric soils exist at the sample plot.

Hydrology

Prior to conducting the on-site investigation, all available background data were reviewed to determine the presence of saturated soil conditions or standing water. If present, surface water depths were measured and recorded at each sample plot; however, if standing water was absent, the presence of free standing water and/or soil saturation within the excavated soil pit was measured. Soil pits are typically left open for at least one hour prior to recording data. In addition to measuring water depths, the site was investigated for other primary and secondary indicators listed on the data forms.

RESULTS

Site Description

Current Land Uses

The western parcel is composed of agricultural field (west half) and emergent/wet meadow wetland (east half), while the eastern parcel contains primarily emergent/wet meadow wetland with fallow field located on the far north and south ends of the site.

Water Features/Hydrology

Primary wetland hydrology indicators A1 (Surface Water), A2 (High Water Table), A3 (Saturation) & B8 (Sparsely vegetated Concave Surface) along with secondary wetland hydrology indicator D2 (Geomorphic Position) were present at all the wetland plots (Plots 4, 5, 8, 10, 12, 14 & 15). Primary

wetland hydrology indicator B13 (Aquatic fauna) was also confirmed in wetland 1 (Plots 4, 5, 8 & 10) due to the presence of calling boreal chorus frogs, spring peepers and northern leopard frogs. Secondary wetland hydrology indicator D5 (FAC-neutral Test) was present at wetland Plot 15.

Soils

Both NRCS Hydric Soil Indicators A11 (Depleted Below Dark Surface) & F3 (Depleted Matrix) were found at all the wetland plots (4, 5, 8, 10 & 12) except Plots 14 and 15. Plot 15 did not meet the F3 Indicator, but hydric soil indicator A11 was present. Wetland Plot 14 was naturally problematic due to seasonal hydrology. The presence of wetland hydrology and location within a concave landscape that appears to pond water for long periods of times suggests a hydric soil is present.

Plant Communities

Three communities (two upland and one wetland) were identified on-site (Table 3).

Table 3. Surveyed Plant Communities.

Upland Communities	Wetland Communities
Agricultural Field	Emergent/Wet Meadow
Fallow Field	

Findings

Wetland Communities

Two wetlands were located during site visits conducted by NES on May 6 & 7, 2019 (Appendix H).

Wetland 1, an emergent/wet meadow wetland (E2K), is 543,686 ft² in size (Plots 4, 5, 8 & 10). Neither the WDNR SWDV WWI nor the NRCS Wetland Inventory has any features mapped in this area.

- Plot 4: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation. Standing water was 8.5" deep. Primary wetland hydrology indicators A1, A2, A3, B8 & B13 and secondary indicator D2 were present. Breeding frogs were heard within the sample plot providing evidence of B13 (Aquatic Fauna). Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident 7 out of 33 photo years, 2 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 & F3 NRCS Hydric Soil Indicators.
- Plot 5: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation. Standing water was 4.5" deep. Primary wetland hydrology indicators A1, A2, A3, B8 & B13 and secondary indicator D2 were present.

Breeding frogs were heard within the sample plot providing evidence of B13 (Aquatic Fauna). Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident 7 out of 33 photo years, 2 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 & F3 NRCS Hydric Soil Indicators.



Photo 1. Wetland 1, emergent/wet meadow, viewing north past Plot 3 toward Plot 4.



Photo 2. Wetland 1, emergent/wet meadow, viewing east past Plot 4 (left) and Plot 3 (right).



Photo 3. Wetland 1, emergent/wet meadow, viewing east past upland Plot 6 toward wetland Plot 5.



Photo 4. Wetland 1, emergent/wet meadow, viewing south past wetland Plot 5 (left) and upland Plot 6 (right).

Plot 8: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation. Standing water was 5" deep. Primary wetland

hydrology indicators A1, A2, A3, B8 & B13 and secondary indicator D2 were present. Breeding frogs were heard within the sample plot providing evidence of B13 (Aquatic Fauna). Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident 7 out of 33 photo years, 2 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 & F3 NRCS Hydric Soil Indicators.



Photo 5. Wetland 1, emergent/wet meadow, viewing southeast past Plot 7 toward Plot 8.



Photo 6. Wetland 1, emergent/wet meadow, viewing northeast from Plot 7 along wetland boundary.

Plot 10: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation. Standing water was 5" deep. Primary wetland hydrology indicators A1, A2, A3, B8 & B13 and secondary indicator D2 were present. Breeding frogs were heard within the sample plot providing evidence of B13 (Aquatic Fauna). Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident 7 out of 33 photo years, 2 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 & F3 NRCS Hydric Soil Indicators.



Photo 7. Wetland 1, emergent/wet meadow, viewing southwest along wetland boundary, Plot 9 can be seen on the right.

The wetland boundaries were established using a combination of wetland hydrology indicators, hydric soils, topography and professional judgment. Soil probes were taken between established upland and wetland sample plots and within the upland/wetland transition zone along the boundary to observe the soil profile and hydrology indicators. Obvious topographic changes, vegetation and hydrology indicators were visually assessed within the transition zone to establish differences between the upland and wetland communities.



Photo 8. Wetland 1, emergent/wet meadow, viewing south toward Plot 10.

Wetland 2, an emergent/wet meadow wetland (E2K), is 99,787 ft² in size (Plots 12, 14 & 15). Neither the WDNR SWDV WWI nor the NRCS Wetland Inventory have any features mapped in this area.

- Plot 12: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation. Standing water was 4" deep. Primary wetland hydrology indicators A1, A2, A3 & B8 and secondary indicator D2 were present. Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident out of 33 photo years, 1 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 & F3 NRCS Hydric Soil Indicators.
- Plot 14: Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot; however, the presence of wetland hydrology suggests the presence of hydrophytic vegetation. Standing water was 0.5" deep. Primary wetland hydrology indicators A1, A2, A3 & B8 and secondary indicator D2 were present. Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident out of 33 photo years, 1 out of 16 normal years, many of which have occurred within the past 10 years. Hydric soil indicators were not present so the procedure for determining hydric soils in problematic situations was employed. A problematic soil situation exists at the sample plot due to seasonal hydrology. The presence of wetland hydrology and location within a concave landscape position that appears to pond water for long periods of time suggests a hydric soil is present.



Photo 9. Wetland 2, emergent/wet meadow, viewing south past Plot 11 toward Plot 12.



Photo 10. Wetland 2, emergent/wet meadow, viewing west toward Plot 12.



Photo 11. Wetland 2, emergent/wet meadow, viewing east past Plot 14 toward Plot 13.



Photo 12. Wetland 2, emergent/wet meadow, viewing north along the wetland boundary toward Plots 14 (left) and 13 (right).

Plot 15: Dominant vegetation was *Phalaris arundinacea*. The Dominance Test and Prevalence Index are 100.0% and 2.000. Standing water was 3" deep. Primary wetland hydrology indicators A1, A2, A3 & B8 and secondary indicators D2 & D5 were present. Reoccurring wetness signatures on the FSA, Google & NAIP imagery are evident out of 33 photo years, 1 out of 16 normal years, many of which have occurred within the past 10 years. Soil matched the A11 NRCS Hydric Soil Indicator.



Photo 13. Wetland 2, emergent/wet meadow, viewing south past Plot 15 toward Plot 16.



Photo 14. Wetland 2, emergent/wet meadow, viewing north past Plot 16 toward Plot 15.

The wetland boundaries were established using a combination of hydrophytic vegetation (where applicable), wetland hydrology indicators, hydric soils (where applicable), topography and professional judgment. Soil probes were taken between established upland and wetland sample plots and within the upland/wetland transition zone along the boundary to observe the soil profile and hydrology indicators. Obvious topographic changes, vegetation and hydrology indicators were visually assessed within the transition zone to establish differences between the upland and wetland communities.



Photo 15. Upland, agricultural field, viewing south past Plot 1.



Photo 16. Upland, agricultural field, viewing north past Plot 2.

Reoccurring wetness signatures on the FSA, NAIP & Google Earth imagery are evident 0 out of 33 photo years, 0 out of 16 normal years within the western half of the western parcel containing Plots 1 & 2.

CONCLUSION

The USACE Regulatory Program includes Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (CWA). Section 10 requires a permit for any work in, over, or under a navigable water of the U.S., while Section 404 requires a permit for the discharge of dredged or fill material into waters of the U.S. Many waterbodies and wetlands in the U.S. are considered waters of the U.S. and are therefore subject to the USACE Section 404 regulatory authority; however, isolated wetlands and headwater streams may not be considered jurisdictional. The WDNR regulates all wetlands, navigable waters, and adjacent lands under a variety of Wisconsin State Statutes (Chapter 30 and 281) and Wisconsin Administrative Codes (NR 103, 299, 350, and 353). Municipalities, townships, and counties may also apply regulations such as but not limited to zoning setbacks and protections over floodplains, shorelands, waterways, and wetlands. Each agency independently makes decisions over the regulatory jurisdiction of wetlands and waterways. Any permit requirements associated with a particular project will be determined by regulatory staff.

Wetland boundaries established on the property are NES' best estimate of their locations based upon the conditions and field indicators observed at the time of our site investigation. Our wetland boundaries are seldom changed; however, the regulating agencies (USACE, WDNR and other local governing units) decide their ultimate location. As a result, our wetland boundaries could be adjusted slightly during an agency review. Weather factors and the time of year reviewed are just two factors that could change a wetland's appearance and result in a boundary change. Because changes could occur, it is NES' policy to recommend to all our clients that they receive agency concurrence from both the WDNR and the USACE.

However, since Mr. Havel is a Professional Wetland Delineator assured by the WDNR, he will not need WDNR concurrence. The WDNR has thoroughly reviewed his education, field experience and report preparation capabilities and accepted him into their program, which means automatic concurrence on any project in which he is the lead field investigator and report author. As part of the program requirements, however, he is still required to send a copy of the report to the WDNR in Madison. Unfortunately, the USACE does not yet have a similar program so we will send them a copy of the report to ensure they agree with the wetland boundary established by NES. Agency concurrence will also guarantee that this delineation is valid for the next five years.

NES ecologists also classified each wetland into one of three categories of susceptibility (Highly, Moderately & Less) designated by the WDNR so protective buffers can be established around wetlands when implementing storm water management activities pertaining to Wisconsin Administrative Code NR 151. The classification for each wetland is displayed in a summarized table found in Appendix I.

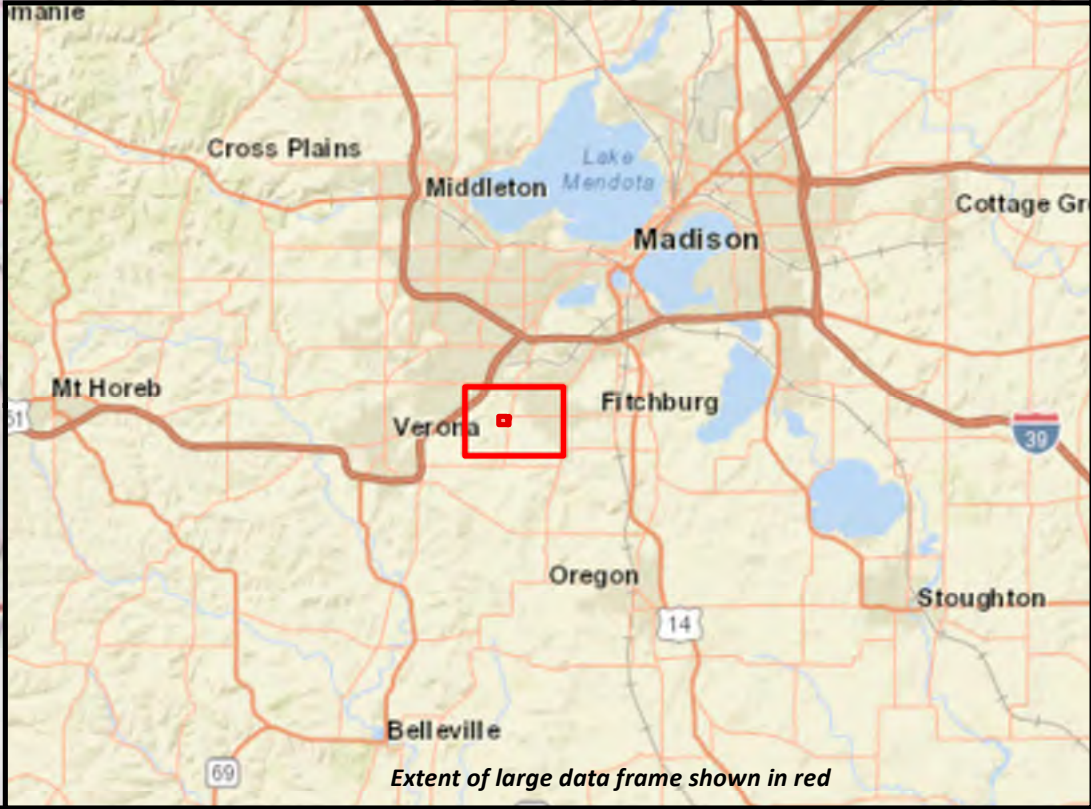
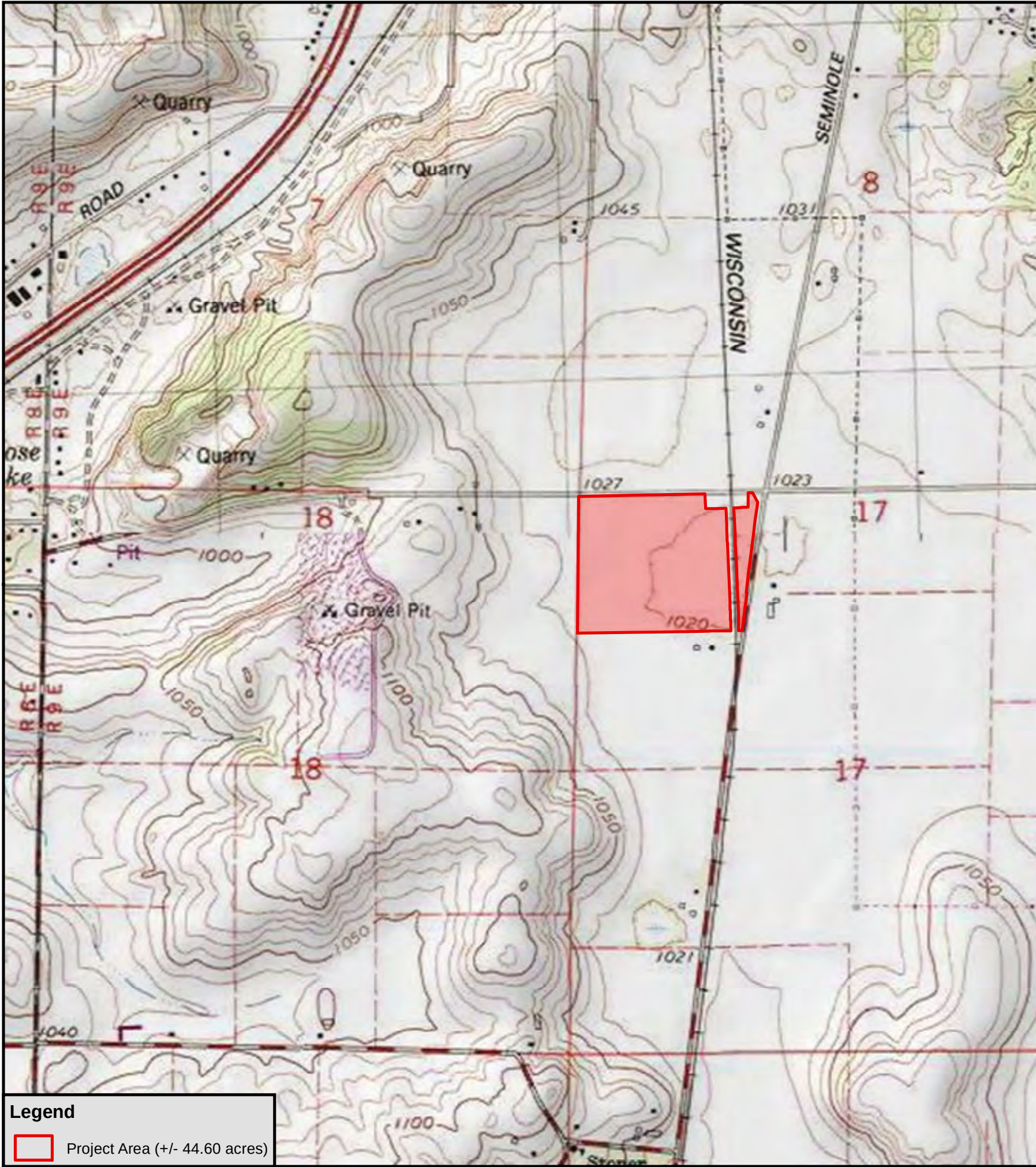
LITERATURE CITED

- Dane County Land Information Department. 2019. Dane County GIS Services, Wisconsin. <https://dcimapapps.countyofdane.com/dcmapviewer/> Last accessed May 9, 2019.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 Wetland Ratings*. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.
- Midwest Regional Climate Center. 2019. Climate Data for Dane County, Wisconsin. <http://agacis.rcc-acis.org/?fips=55025>. Last accessed: May 9, 2019.
- Munsell Color Corporation. 2010. *Munsell Soil Color Charts*.
- National Geographic Society. 2019. *USGS Topographic Map*. http://goto.arcgisonline.com/maps/USA_Topo_Maps. Last accessed: May 10, 2019.
- Natural Resource Conservation Service. 2019. *National Hydric Soils List*. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316619.html
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Web Soil Survey*. <http://websoilsurvey.nrcs.usda.gov>. Last accessed: May 9, 2019.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Available online at <http://sdmdataaccess.nrcs.usda.gov/>. Accessed May 9, 2019.
- United States Army Corps of Engineers (USACE). 2016. *Guidance for Offsite Hydrology / Wetland Determinations*. St. Paul District & Minnesota Board of Water & Soil Resources. <http://www.mvp.usace.army.mil/Missions/Regulatory/Delineation>
- USACE. 2015. *Guidance for Submittal of Delineation Reports to the St. Paul District Army Corps of Engineers and the Wisconsin Department of Natural Resources*. St. Paul District Regulatory, St. Paul, Minnesota.
- USACE. 2012. *Regional Supplement to the 1987 Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. Engineering Research and Development Center. ERDC/EL TR-21-1.
- United States Department of Agriculture (USDA), National Resource Conservation Service. 1997. *Engineering Field Handbook: Hydrology Tools for Wetland Determination (Chapter 19) - Rainfall Documentation Worksheet*.
- USDA, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.
- USDA, FSA. National Agricultural Imagery Program (NAIP). Salt Lake City, UT: Aerial photography Field Office.
- Wisconsin Department of Natural Resources (WDNR). 2018. *Surface Water Data Viewer*. <http://dnrmapping.wi.gov/sl/?Viewer=SWDV>. Last accessed: May 9, 2019.
- WDNR. 2015. *Waterway/Wetland, Guidance for the Establishment of Protective Areas for Wetlands in Runoff Management Rules, Wisconsin Administrative Code NR 151*. Bureau of Watershed Management Program Guidance, Stormwater Management Program.

A

APPENDIX A

Site Location



Legend

 Project Area (+/- 44.60 acres)



NES
ECOLOGICAL SERVICES
A Division of Robert E. Lee & Associates, Inc.

Site Location

5/9/2019

Rettlar Corporation

225/0609-172-8501-1 & 225/0609-172-8091-8

NES Project No. 13485019

City of Fitchburg

Dane County, Wisconsin

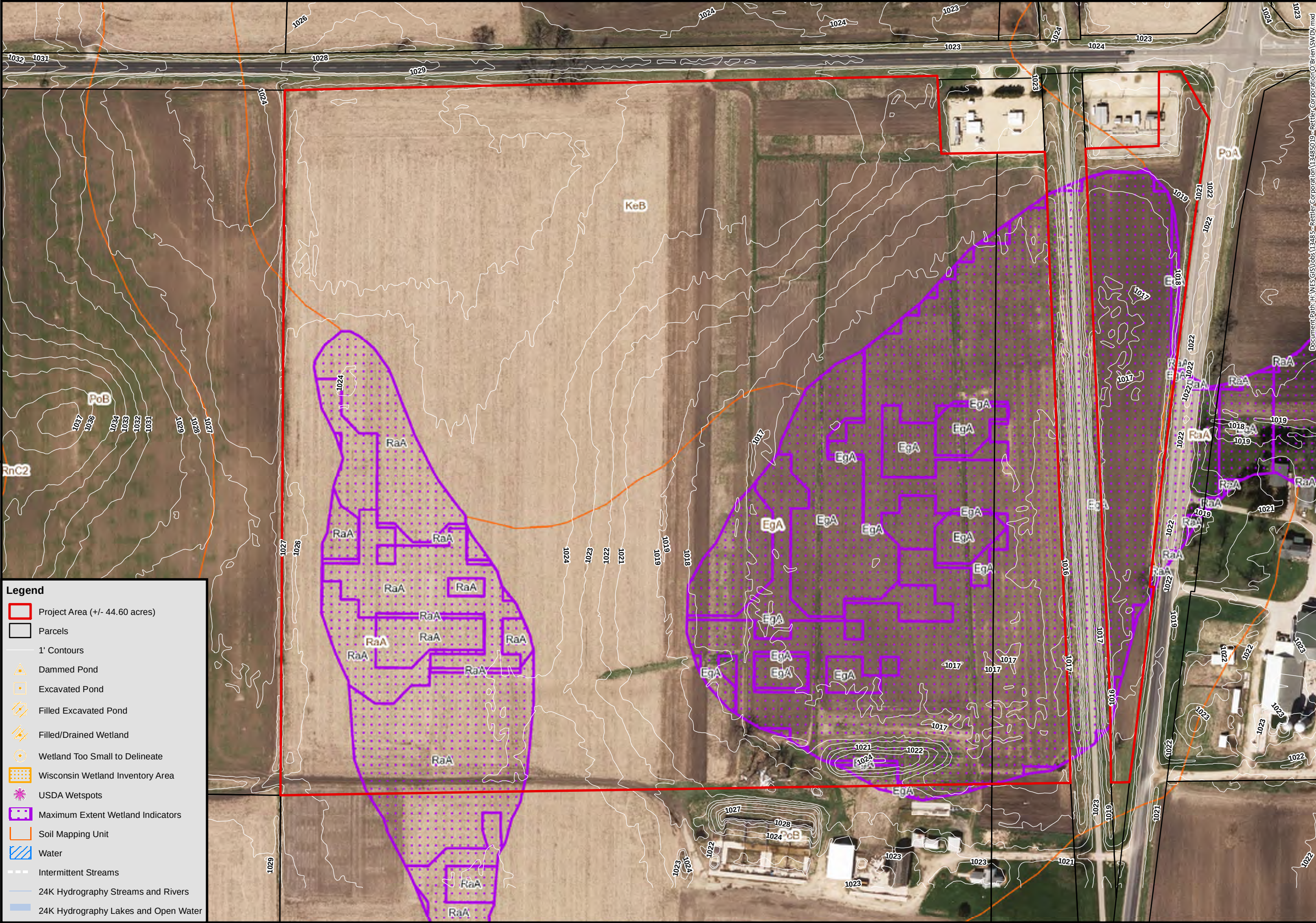
Located in part of:
Section 17, T06N, R09E
City of Fitchburg
Dane County
Wisconsin


0 1,100
Feet

B

APPENDIX B

WDNR Surface Water Data Viewer & Contour Map



Legend

- Project Area (+/- 44.60 acres)
- Parcels
- 1' Contours
- Dammed Pond
- Excavated Pond
- Filled Excavated Pond
- Filled/Drained Wetland
- Wetland Too Small to Delineate
- Wisconsin Wetland Inventory Area
- USDA Wetspots
- Maximum Extent Wetland Indicators
- Soil Mapping Unit
- Water
- Intermittent Streams
- 24K Hydrography Streams and Rivers
- 24K Hydrography Lakes and Open Water



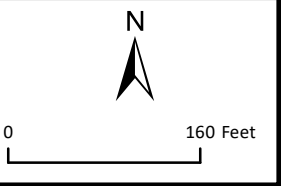
**WDNR Surface
Water Data Viewer
& 1' Contours**

6/12/2019

Rettler Corporation
225/0609-172-8501-1 & 225/0609-172-8091-8
NES Project No. 13485019
City of Fitchburg
Dane County, Wisconsin

Sources: Robert E. Lee
& Associates, Inc., WDNR
Dane County, 2017 Ortho

Disclaimer: Robert E. Lee & Associates, Inc. makes every effort to ensure this map is free of errors but does not warrant the map or its features are either spatially or temporally accurate or fit for a particular use. Robert E. Lee & Associates, Inc. provides this map without any warranty of any kind whatsoever, either expressed or implied.



C

APPENDIX C

NRCS Wetland Inventory Map

Date: April 19, 2019
Operator: .
Township: T6N R9E Sec 17

Wetland Inventory Map
Farm#
Tract#

Agency: NRCS
County: Dane
Mapped by: Kristen LaBlanc



— FSA CLU
— Wetland Delineation

0 625 1,250 2,500
Feet



D

APPENDIX D

NRCS WETS Table & Daily Data for the Arboretum UNIV WIS Station

WETS Table

WETS Station: ARBORETUM UNIV WIS, WI													
Requested years: 1971 - 2000													
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0. 10 or more	Avg Snowfall					
Jan	26.7	5.7	16.2	1.34	0.85	1.61	4	-					
Feb	32.4	10.7	21.6	1.34	0.69	1.61	4	-					
Mar	44.1	21.9	33.0	2.40	1.22	2.94	5	2.8					
Apr	57.4	33.3	45.3	3.90	2.87	4.58	7	1.0					
May	70.3	44.3	57.3	3.87	2.49	4.66	7	0.0					
Jun	79.5	53.0	66.2	4.62	2.78	5.61	7	0.0					
Jul	83.6	58.0	70.8	4.43	3.11	5.25	6	0.0					
Aug	81.6	55.8	68.7	4.17	3.08	4.90	7	0.0					
Sep	73.7	46.8	60.2	3.55	1.81	4.33	6	0.0					
Oct	61.7	35.9	48.8	2.62	1.64	3.17	6	0.0					
Nov	45.5	25.4	35.5	2.67	1.67	3.23	6	-					
Dec	31.8	12.6	22.2	1.92	1.02	2.35	5	-					
Annual:					34.00	39.92							
Average	57.4	33.6	45.5	-	-	-	-	-					
Total	-	-	-	36.83			69	-					
GROWING SEASON DATES													
Years with missing data:	24 deg = 3	28 deg = 3	32 deg = 3										
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0										
Data years used:	24 deg = 27	28 deg = 27	32 deg = 27										
Probability	24 F or higher	28 F or higher	32 F or higher										
50 percent *	4/20 to 10/16: 179 days	5/3 to 10/4: 154 days	5/16 to 9/23: 130 days										
70 percent *	4/16 to 10/21: 188 days	4/29 to 10/9: 163 days	5/9 to 9/ 30: 144 days										
* Percent chance of the growing season occurring between the Beginning and Ending dates.													
STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1971										M1. 70	4.38	3.89	9.97
1972	0.52	0.61	2.36	2.76	3.29	1.02	3.86	8.29	4. 93	3. 52	1.25	1.92	34. 33
1973	1.72	1.66	5.15	8.11	7.36	2.25	1.84	2.18	4. 98	3. 21	1.90	2.43	42. 79
1974	2.86	1.45	3.66	4.47	6.27	3.76	2.58	3.36	0. 89	3. 59	2.53	2.17	37. 59
1975	1.28	1.87	3.49	4.69	4.38	7.71	5.19	4.49	1. 25	0. 76	3.34	0.34	38. 79
1976	0.71	2.65	4.95	5.73	2.32	1.90	1.24	1.97	0. 65	1. 96	0.16	0.46	24. 70
1977	0.44	1.24	4.05	3.21	1.85	3.20	8.66	3.63	2. 79	2. 56	2.70	1.69	36. 02
1978	1.17	0.24	0.40	5.55	5.93	9.96	7.12	2.07	6. 60	1. 09	3.70	1.63	45. 46
1979	2.81	1.00	3.17	2.47	1.90	3.05	2.23	8.19	0.	3.	2.40	1.86	32.

										08	19		
1980	M1.11	0.51	0.44	M2.22	2.43	5.64	5.01	7.76			1.50	1.60	1.93
1981	0.58	2.78	0.42	3.55	0.67	5.73	5.38	6.04	5.33	4.08	1.99	1.09	37.64
1982	M1.57	M0.21	3.60	M2.96	6.08	4.45	3.39	3.31	0.71	1.81	5.12	3.34	36.55
1983	0.32	1.07	3.49	3.12	4.13	2.08	2.63	4.09	4.40	2.37	3.99	M2.19	33.88
1984	0.37	0.22	2.63	4.28	4.02	7.12	3.96	3.02	3.20	6.27	3.80	6.74	45.63
1985	1.25	1.45	1.13	1.37	3.70	2.66	2.14	2.71	6.74	5.58	5.55	3.49	37.77
1986	0.86	2.78	1.28	2.81	2.96	3.03	4.53	4.50	8.20	2.83	1.14	M0.66	35.58
1987	0.55	0.05	1.78	3.93	4.15	1.45	3.32	7.31	4.14	1.24	3.76	4.75	36.43
1988	1.10		1.33	3.45	1.33	2.18	2.63	2.75	4.29	2.25	3.18	1.74	26.23
1989	0.45	0.81	1.51	2.21	1.55	1.97	5.04	M5.59	2.55	1.88	1.17	M0.36	25.09
1990	M1.07	0.96	3.54	2.71	5.66	4.93	2.57	4.82	1.49	M2.70	2.23	3.02	35.70
1991	1.21	0.31	4.57	5.49	2.53	3.95	5.50	2.41	4.03	5.35	2.81	1.13	39.29
1992	1.27	M1.43	1.84	4.05	0.62	1.01	6.72	M3.91	5.64	1.82	M6.68	M2.39	37.38
1993	M1.56	M1.32	2.77	6.15	4.31	7.49	10.45	4.28	5.11	M0.90	M0.94	M0.39	45.67
1994	M1.93	2.70	0.27	1.72	M2.97	5.80	M3.02	4.89	8.30	0.71	2.92	1.03	36.26
1995	M1.44	T	2.57	5.35	4.37	1.43	4.41	3.40	2.34	5.11	M2.65	M0.53	33.60
1996	M2.14	M0.37	M0.15	2.02	3.58	12.07	4.38	1.49	1.43	3.57	1.07	M0.89	33.16
1997	M1.50	1.78	1.66	1.81	3.85	5.83	8.68	3.15	1.17	1.30	M1.52	M1.12	33.37
1998	2.79	2.07	5.48	5.25	4.78	8.12	2.71	2.97	2.14	M4.14	M2.37	0.37	43.19
1999	M3.00	M1.89	0.71	7.85	4.29	M4.67	6.32	M2.72	1.99	0.95	1.32	M1.15	36.86
2000	M1.16	M2.83	1.33	3.75	10.90	9.61	2.83	5.66	3.97	0.69	2.03	M3.00	47.76
2001	M1.44	M2.16	M0.45	3.35	4.63	5.86	M0.98	M9.12	5.79	2.75	M2.25	M1.98	40.76
2002	0.47	M2.69	M1.41	M4.27	2.91	M5.18	M3.78	M2.48	M3.13	M2.65	0.90	M0.73	30.60
2003	0.28	0.37	1.84	2.77	6.97	3.61	3.86	1.11	4.29	M1.12	6.66	2.39	35.27
2004	M0.81	1.42	3.77	1.91	11.13	4.26	4.18	3.21	0.94	2.13	2.06	M1.69	37.51
2005	M2.66	M2.66	M1.73	1.92	M3.71	1.76	M2.62	1.71	1.93	0.82	M3.03	1.21	25.76
2006	M1.56	1.09	2.49	6.34	M5.04	2.16	M4.75	5.86	M3.56	2.88	2.80	M1.54	40.07
2007	M0.30	2.28	2.34	6.86	1.70	2.93	2.22	13.49	1.97	3.30	0.27	M3.39	41.05
2008	M2.03	3.74	1.91	7.64	M2.54	9.56	4.57	2.68	4.13	2.52	M1.48	M3.53	46.33
2009	M0.77	1.88	6.00	4.68	M3.54	4.60	2.33	3.55	3.20	5.00	1.54	M2.50	39.59
2010	1.05	1.16	0.97	4.52	4.19	8.64	8.14	4.94	5.60	3.07	1.37	2.27	45.92
2011	0.95	2.37	3.21	4.82	M2.86	3.10	2.12	3.94	4.50	1.85	3.76	2.45	35.93
2012	M1.07	1.11	3.28	2.91	4.40	0.51	4.67	2.42	1.24	5.90	0.97	3.35	31.83
2013	2.94	2.83	2.69	6.55	7.09	11.73	2.80	1.28	2.	M1.	3.89	1.13	47.

									56	55		04
2014	1.01	1.27	1.37	5.51	2.97	9.14	2.37	4.06	3.50	2.74	1.54	36.53
2015	0.70	1.88	0.91	3.65	4.05	3.72	4.68	4.30	6.11	2.46	5.25	42.23
2016	0.89	0.68	3.88	2.12	3.14	5.75	7.87	5.56	5.40	4.66	2.17	44.09
2017	3.01	1.92	3.87	4.64	4.04	7.92	10.49	2.70	0.85	4.51	0.99	45.52
2018	1.91	2.99	0.83	2.60	9.59	11.03	M3.73	11.38	7.76	M6.15	1.98	61.40
2019	M1.97	M3.11	1.21	3.25	M1.25							10.79

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2016-07-22

Climatological Data for ARBORETUM UNIV WIS, WI - May 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-05-01	44	41	42.5	3	0	0.46	M	M
2019-05-02	51	42	46.5	7	0	0.01	M	M
2019-05-03	53	36	44.5	5	0	0.02	M	M
2019-05-04	61	33	47.0	7	0	0.00	M	M
2019-05-05	68	49	58.5	19	9	0.00	M	M
2019-05-06	75	49	62.0	22	12	0.69	M	M
2019-05-07	M	M	M	M	M	M	M	M
2019-05-08	59	40	49.5	10	0	0.07	0.0	0
2019-05-09	M	M	M	M	M	M	M	M
2019-05-10	M	M	M	M	M	M	M	M
2019-05-11	M	M	M	M	M	M	M	M
2019-05-12	M	M	M	M	M	M	M	M
2019-05-13	M	M	M	M	M	M	M	M
2019-05-14	M	M	M	M	M	M	M	M
2019-05-15	M	M	M	M	M	M	M	M
2019-05-16	M	M	M	M	M	M	M	M
2019-05-17	M	M	M	M	M	M	M	M
2019-05-18	M	M	M	M	M	M	M	M
2019-05-19	M	M	M	M	M	M	M	M
2019-05-20	M	M	M	M	M	M	M	M
2019-05-21	M	M	M	M	M	M	M	M
2019-05-22	M	M	M	M	M	M	M	M
2019-05-23	M	M	M	M	M	M	M	M
2019-05-24	M	M	M	M	M	M	M	M
2019-05-25	M	M	M	M	M	M	M	M
2019-05-26	M	M	M	M	M	M	M	M
2019-05-27	M	M	M	M	M	M	M	M
2019-05-28	M	M	M	M	M	M	M	M
2019-05-29	M	M	M	M	M	M	M	M
2019-05-30	M	M	M	M	M	M	M	M
2019-05-31	M	M	M	M	M	M	M	M
Average Sum	58.7	41.4	50.1	73	21	1.25	0.0	0.0

Climatological Data for ARBORETUM UNIV WIS, WI - April 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-04-01	42	25	33.5	0	0	0.00	0.0	0
2019-04-02	53	35	44.0	4	0	0.01	0.0	0
2019-04-03	49	28	38.5	0	0	0.01	0.0	0
2019-04-04	58	38	48.0	8	0	T	0.0	0
2019-04-05	42	37	39.5	0	0	T	0.0	0
2019-04-06	59	37	48.0	8	0	0.00	0.0	0
2019-04-07	64	44	54.0	14	4	0.00	0.0	0
2019-04-08	63	41	52.0	12	2	0.21	0.0	0
2019-04-09	73	36	54.5	15	5	0.00	0.0	0
2019-04-10	67	32	49.5	10	0	0.00	0.0	0
2019-04-11	38	32	35.0	0	0	0.34	T	T
2019-04-12	43	32	37.5	0	0	0.55	0.0	0
2019-04-13	43	31	37.0	0	0	0.00	0.0	0
2019-04-14	43	33	38.0	0	0	0.00	0.0	0
2019-04-15	43	21	32.0	0	0	0.00	0.0	0
2019-04-16	57	43	50.0	10	0	0.06	0.0	0
2019-04-17	69	47	58.0	18	8	0.00	0.0	0
2019-04-18	67	44	55.5	16	6	0.07	0.0	0
2019-04-19	46	37	41.5	2	0	0.00	0.0	0
2019-04-20	62	29	45.5	6	0	0.00	0.0	0
2019-04-21	67	42	54.5	15	5	0.00	0.0	0
2019-04-22	81	44	62.5	23	13	0.00	0.0	0
2019-04-23	78	44	61.0	21	11	0.94	0.0	0
2019-04-24	66	37	51.5	12	2	0.00	0.0	0
2019-04-25	67	42	54.5	15	5	0.00	0.0	0
2019-04-26	71	42	56.5	17	7	0.39	0.0	0
2019-04-27	63	39	51.0	11	1	0.00	0.0	0
2019-04-28	41	26	33.5	0	0	0.26	M	T
2019-04-29	53	40	46.5	7	0	0.39	0.0	0
2019-04-30	50	42	46.0	6	0	0.02	0.0	0
Average Sum	57.3	36.7	47.0	250	69	3.25	T	0.0

E

APPENDIX E

NRCS Rainfall Documentation Worksheet

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	5/6/2019	Landowner/Project	Rettler
Weather Station	Arboretum Univ WIS	State	Wisconsin
County	Dane	Growing Season	
Photo/obs Date		Soil Name	

shaded cells are locked or calculated	Long-term rainfall statistics (from WETS table or State Climatology Office)								
		30% chance <	30% chance >		Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns	
	Month			Precip					
	1st Prior Month*	April	2.87	4.58	3.25	N	2	3	6
	2nd Prior Month*	March	1.22	2.94	1.21	D	1	2	2
3rd Prior Month*	February	0.69	1.61	3.11	W	3	1	3	
*compared to photo/observation date								Sum	11

Note: If sum is

6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:

Dry =1

Normal =2

Wet =3

Conclusions: prior period has been normal

F

APPENDIX F

Northcentral/Northeast Supplement Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****001****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** flat**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9993159990668**Long.:** -89.4653165728083**Datum:** 1983 HARN**Soil Map Unit Name:** Radford silt loam, 0 to 3 percent slopes (RaA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?**Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?**Yes ☐ No ☒**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, agricultural field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____	
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 001

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Herb Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Elymus repens</i>	50	☒	FACU
2. <i>Urtica dioica</i>	40	☒	FAC
3. <i>Taraxacum officinale</i>	20	☐	FACU
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
8. _____	0	☐	_____
9. _____	0	☐	_____
10. _____	0	☐	_____
11. _____	0	☐	_____
12. _____	0	☐	_____
110 = Total Cover			
Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>40</u>	x 3 = <u>120</u>
FACU species <u>70</u>	x 4 = <u>280</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>110</u> (A)	<u>400</u> (B)

Prevalence Index = B/A = 3.636

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

Vegetation is considered significantly disturbed due to agricultural activities. No vegetation was present at the sample plot. Vegetation found in an adjacent (west) fencerow was recorded since it was located in a similar landscape position. Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.

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

Soil

Sampling Point: 001

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****002****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** flat**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9979746832473**Long.:** -89.4645975818456**Datum:** 1983 HARN**Soil Map Unit Name:** Radford silt loam, 0 to 3 percent slopes (RaA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?** Yes ☐ No ☒**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, agricultural field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____	
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 002

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Acer negundo</i>	5	☒	FAC	
2.	0	☐		Total Number of Dominant Species Across All Strata: 3 (B)
3.	0	☐		Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)
4.	0	☐		Prevalence Index worksheet:
5.	0	☐		
6.	0	☐		OBL species 0 x 1 = 0
7.	0	☐		FACW species 0 x 2 = 0
= Total Cover				FAC species 5 x 3 = 15
Sapling/Shrub Stratum (Plot size: 15')				FACU species 106 x 4 = 424
1. <i>Malus pumila</i>	5	☒	UPL	UPL species 5 x 5 = 25
2.	0	☐		Column Totals: 116 (A) 464 (B)
3.	0	☐		Prevalence Index = B/A = 4.000
4.	0	☐		Hydrophytic Vegetation Indicators:
5.	0	☐		
6.	0	☐		☐ Dominance Test is > 50%
7.	0	☐		☐ Prevalence Index is ≤3.0 ¹
8.	0	☐		☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
9.	0	☐		☐ Problematic Hydrophytic Vegetation ¹ (Explain)
10.	0	☐		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
11.	0	☐		Definitions of Vegetation Strata:
12.	0	☐		
= Total Cover				Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..
Woody Vine Stratum (Plot size:)				Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
1.	0	☐		Woody vine - All woody vines greater than 3.28 ft in height.
2.	0	☐		Hydrophytic Vegetation Present? Yes ☐ No ☒
3.	0	☐		
4.	0	☐		
= Total Cover				

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

Vegetation is considered significantly disturbed due to agricultural activities. No vegetation was present at the sample plot. Vegetation found in an adjacent (west) fencerow was recorded since it was located in a similar landscape position. Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.

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

Soil

Sampling Point: 002

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:** 003**Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9976732147789**Long.:** -89.4615332117154**Datum:** 1983 HARN**Soil Map Unit Name:** Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?** Yes ☒ No ☐**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) The sample plot is located in an upland, fallow field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____	
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 003

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Herb Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Elymus repens</i>	90	☒	FACU
2. <i>Carduus nutans</i>	15	☐	FACU
3. <i>Poa pratensis</i>	5	☐	FACU
4. <i>Taraxacum officinale</i>	5	☐	FACU
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
8. _____	0	☐	_____
9. _____	0	☐	_____
10. _____	0	☐	_____
11. _____	0	☐	_____
12. _____	0	☐	_____
115 = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>115</u>	x 4 = <u>460</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u> (A)	<u>460</u> (B)

Prevalence Index = B/A = 4.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.

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

Soil

Sampling Point: 003

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8

City/County: Fitchburg/Dane

Sampling Date: 06-May-19

Applicant/Owner: Rettler Corporation

State: WI

Sampling Point:

004

Investigator(s): Havel, Rock

Section, Township, Range: S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope

Local relief (concave, convex, none): concave

Slope: 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR K

Lat.: 42.9978156631246

Long.: -89.4615282442124

Datum: 1983 HARN

Soil Map Unit Name: Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)

NWI classification: None

Are climatic/hydrologic conditions on the site typical for this time of year?

Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?**

Are "Normal Circumstances" present?

Yes ☒ No ☐

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of 2 required)</u>	
☒ Surface Water (A1) ☒ High Water Table (A2) ☒ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☒ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes ☒ No ☐ Water Table Present? Yes ☒ No ☐ Saturation Present? (includes capillary fringe) Yes ☒ No ☐	Depth (inches): 8.5 Depth (inches): 0 Depth (inches): 0	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of five primary and one secondary indicator at the sample plot provides evidence of wetland hydrology. Breeding frogs (boreal chorus frog, spring peeper & northern leopard frog) were observed within the wetland, which meets the B13 indicator.			

VEGETATION - Use scientific names of plants

Sampling Point: 004

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
0 = Total Cover			
Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
0 = Total Cover			
Herb Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
12.	0	☐	
0 = Total Cover			
Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 004

[illegible]

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****005****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** concave**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9984112504503**Long.:** -89.4627171668972**Datum:** 1983 HARN**Soil Map Unit Name:** Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?**Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?**Yes ☒ No ☐**Are Vegetation** ☒ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
☒ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☒ High Water Table (A2)	☒ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☒ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☒ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☒ No ☐	Depth (inches):	4.5
Water Table Present?	Yes ☒ No ☐	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	0
Wetland Hydrology Present? Yes ☒ No ☐			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of five primary and one secondary indicator at the sample plot provides evidence of wetland hydrology. Breeding frogs (boreal chorus frog, spring peeper & northern leopard frog) were observed within the wetland, which meets the B13 indicator.			

VEGETATION - Use scientific names of plants

Sampling Point: 005

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Sapling/Shrub Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Herb Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
8.		0	☐	
9.		0	☐	
10.		0	☐	
11.		0	☐	
12.		0	☐	
		0	= Total Cover	
Woody Vine Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
		0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species 0 x 1 = 0

FACW species 0 x 2 = 0

FAC species 0 x 3 = 0

FACU species 0 x 4 = 0

UPL species 0 x 5 = 0

Column Totals: 0 (A) 0 (B)

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 005

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

The soil at the sample plot matches the A11 (Depleted Below Dark Surface) & F3 (Depleted Matrix) Indicators described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****006****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.998389227164**Long.:** -89.4630139163824**Datum:** 1983 HARN**Soil Map Unit Name:** Plano silt loam, gravelly substratum, 2 to 6 percent slopes (PoB)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?**Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?**Yes ☐ No ☒**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, agricultural field.	

Hydrology

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____	
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 006

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
0 = Total Cover			
Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
0 = Total Cover			
Herb Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Plantago major</i>	5	☒	FACU
2. <i>Elymus repens</i>	5	☒	FACU
3. <i>Daucus carota</i>	1	☐	UPL
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
11.	0	☐	
12.	0	☐	
11 = Total Cover			
Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 0	x 3 = 0
FACU species 10	x 4 = 40
UPL species 1	x 5 = 5
Column Totals: 11 (A)	45 (B)

Prevalence Index = B/A = 4.091

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

Vegetation is considered significantly disturbed due to agricultural activities. Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.

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

Soil

Sampling Point: 006

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 06-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****007****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17**T.** 6N**R.** 9E**Landform (hillslope, terrace, etc.):** Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9996989286073**Long.:** -89.4623121214017**Datum:** 1983 HARN**Soil Map Unit Name:** Kegonsa silt loam, 2 to 6 percent slopes (KeB)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ☐ No ☒**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** (If needed, explain any answers in Remarks.)**Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, agricultural field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches):	
Water Table Present?	Yes ☒ No ☐	Depth (inches):	35
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	30
Wetland Hydrology Present? Yes ☐ No ☒			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 007

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Sapling/Shrub Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Herb Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
8.		0	☐	
9.		0	☐	
10.		0	☐	
11.		0	☐	
12.		0	☐	
		0	= Total Cover	
Woody Vine Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
		0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

The lack of hydrology and hydric soils suggests that non-hydrophytic vegetation would likely be dominant.

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

Soil

Sampling Point: 007

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8

City/County: Fitchburg/Dane

Sampling Date: 06-May-19

Applicant/Owner: Rettler Corporation

State: WI

Sampling Point:

008

Investigator(s): Havel, Rock

Section, Township, Range: S. 17 T. 6N R. 9E

Landform (hillslope, terrace, etc.): Toeslope

Local relief (concave, convex, none): concave

Slope: 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR K

Lat.: 42.9996553575408

Long.: -89.4621351028037

Datum: 1983 HARN

Soil Map Unit Name: Kegonsa silt loam, 2 to 6 percent slopes (KeB)

NWI classification: None

Are climatic/hydrologic conditions on the site typical for this time of year?

Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?**

Are "Normal Circumstances" present?

Yes ☒ No ☐

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of 2 required)</u>	
☒ Surface Water (A1) ☒ High Water Table (A2) ☒ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☒ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes ☒ No ☐ Water Table Present? Yes ☒ No ☐ Saturation Present? (includes capillary fringe) Yes ☒ No ☐	Depth (inches): 5 Depth (inches): 0 Depth (inches): 0	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of five primary and one secondary indicator at the sample plot provides evidence of wetland hydrology. Breeding frogs (boreal chorus frog, spring peeper & northern leopard frog) were observed within the wetland, which meets the B13 indicator.			

VEGETATION - Use scientific names of plants

Sampling Point: 008

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
8. _____	0	☐	_____
9. _____	0	☐	_____
10. _____	0	☐	_____
11. _____	0	☐	_____
12. _____	0	☐	_____
0 = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 008

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

The soil at the sample plot matches the A11 (Depleted Below Dark Surface) & F3 (Depleted Matrix) Indicators described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****009****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 43.000485093669**Long.:** -89.4609560213006**Datum:** 1983 HARN**Soil Map Unit Name:** Kegonsa silt loam, 2 to 6 percent slopes (KeB)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☒ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?** Yes ☐ No ☒**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, agricultural field.	

Hydrology

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches): _____	
Water Table Present?	Yes ☐ No ☒	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 009

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

Sapling/Shrub Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	

Herb Stratum	(Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Rumex crispus</i>		5	☒	FAC
2. <i>Trifolium repens</i>		3	☒	FACU
3. <i>Barbarea vulgaris</i>		2	☐	FAC
4. <i>Chenopodium album</i>		2	☐	FACU
5. <i>Carduus nutans</i>		1	☐	FACU
6. <i>Taraxacum officinale</i>		1	☐	FACU
7.		0	☐	
8.		0	☐	
9.		0	☐	
10.		0	☐	
11.		0	☐	
12.		0	☐	
		14	= Total Cover	

Woody Vine Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
		0	= Total Cover	

Dominance Test worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

 Total Number of Dominant Species Across All Strata: 2 (B)

 Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:
 Total % Cover of: Multiply by:
 OBL species 0 x 1 = 0
 FACW species 0 x 2 = 0
 FAC species 7 x 3 = 21
 FACU species 7 x 4 = 28
 UPL species 0 x 5 = 0
 Column Totals: 14 (A) 49 (B)

 Prevalence Index = B/A = 3.500

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

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

Definitions of Vegetation Strata:

 Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

 Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

 Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

Vegetation is considered significantly disturbed due to agricultural activities. Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.

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

Soil

Sampling Point: 009

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****010****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** concave**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 43.000267518121**Long.:** -89.4609483057042**Datum:** 1983 HARN**Soil Map Unit Name:** Kegonsa silt loam, 2 to 6 percent slopes (KeB)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?**Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?**Yes ☒ No ☐**Are Vegetation** ☒ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
☒ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☒ High Water Table (A2)	☒ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☒ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☒ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☒ No ☐	Depth (inches):	5
Water Table Present?	Yes ☒ No ☐	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	0
Wetland Hydrology Present? Yes ☒ No ☐			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of five primary and one secondary indicator at the sample plot provides evidence of wetland hydrology. Breeding frogs (boreal chorus frog, spring peeper & northern leopard frog) were observed within the wetland, which meets the B13 indicator.			

VEGETATION - Use scientific names of plants

Sampling Point: 010

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
8. _____	0	☐	_____
9. _____	0	☐	_____
10. _____	0	☐	_____
11. _____	0	☐	_____
12. _____	0	☐	_____
0 = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 010

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

The soil at the sample plot matches the A11 (Depleted Below Dark Surface) & F3 (Depleted Matrix) Indicators described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:** 011**Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 43.0004262927236**Long.:** -89.4599361837689**Datum:** 1983 HARN**Soil Map Unit Name:** Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☒ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ☐ No ☒**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?** (If needed, explain any answers in Remarks.)**Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, fallow field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches):	
Water Table Present?	Yes ☒ No ☐	Depth (inches):	18
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	13
Wetland Hydrology Present? Yes ☐ No ☒			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 011

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	0	☐	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
2. _____	0	☐	_____	
3. _____	0	☐	_____	
4. _____	0	☐	_____	
5. _____	0	☐	_____	
6. _____	0	☐	_____	
7. _____	0	☐	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = <u>0.000</u>
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Hydrophytic Vegetation Indicators: ☐ Rapid Test for Hydrophytic Vegetation ☐ Dominance Test is > 50% ☐ Prevalence Index is ≤ 3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Definitions of Vegetation Strata: Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine - All woody vines greater than 3.28 ft in height.
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Hydrophytic Vegetation Present? Yes ☐ No ☒
0 = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) Vegetation is considered significantly disturbed due to agricultural activities. Due to this disturbance, no vegetation was present. Last growing seasons Panicum capillare, Zea mays & Setaria faberi were observed within the sample plot. The lack of hydrology and hydric soils, and the presence of non-hydrophytic vegetation from the previous growing season, suggests that non-hydrophytic vegetation would likely be dominant.				

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

Soil

Sampling Point: 011

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8

City/County: Fitchburg/Dane

Sampling Date: 07-May-19

Applicant/Owner: Rettler Corporation

State: WI

Sampling Point:

012

Investigator(s): Havel, Rock

Section, Township, Range: S. 17 T. 6N R. 9E

Landform (hillslope, terrace, etc.): Toeslope

Local relief (concave, convex, none): concave

Slope: 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR K

Lat.: 43.0002151508043

Long.: -89.4599539699739

Datum: 1983 HARN

Soil Map Unit Name: Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)

NWI classification: None

Are climatic/hydrologic conditions on the site typical for this time of year?

Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ , Soil ☐ , or Hydrology ☐ significantly disturbed?

Are "Normal Circumstances" present?

Yes ☒ No ☐

Are Vegetation ☒ , Soil ☐ , or Hydrology ☐ naturally problematic?

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.			

Hydrology

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (minimum of 2 required)</u>	
☒ Surface Water (A1) ☒ High Water Table (A2) ☒ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): 4 Water Table Present? Yes ☒ No ☐ Depth (inches): 0 Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0 Wetland Hydrology Present? Yes ☒ No ☐			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of four primary and one secondary indicator at the sample plot provides evidence of wetland hydrology.			

VEGETATION - Use scientific names of plants

Sampling Point: 012

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Sapling/Shrub Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Herb Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
8.		0	☐	
9.		0	☐	
10.		0	☐	
11.		0	☐	
12.		0	☐	
		0	= Total Cover	
Woody Vine Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
		0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology and hydric soils suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 012

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

The soil at the sample plot matches the A11 (Depleted Below Dark Surface) & F3 (Depleted Matrix) Indicators described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****013****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9990940448442**Long.:** -89.4597349959845**Datum:** 1983 HARN**Soil Map Unit Name:** Radford silt loam, 0 to 3 percent slopes (RaA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?** Yes ☒ No ☐**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) The sample plot is located in an upland, road right-of-way.	

Hydrology

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches):	
Water Table Present?	Yes ☐ No ☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches):	
Wetland Hydrology Present? Yes ☐ No ☒			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 013

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	0	☐	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)
2. _____	0	☐	_____	
3. _____	0	☐	_____	
4. _____	0	☐	_____	
5. _____	0	☐	_____	
6. _____	0	☐	_____	
7. _____	0	☐	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>57</u> x 4 = <u>228</u> UPL species <u>60</u> x 5 = <u>300</u> Column Totals: <u>117</u> (A) <u>528</u> (B) Prevalence Index = B/A = <u>4.513</u>
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Hydrophytic Vegetation Indicators: ☐ Rapid Test for Hydrophytic Vegetation ☐ Dominance Test is > 50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Vegetation Strata: Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine - All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes ☐ No ☒
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Remarks: (Include photo numbers here or on a separate sheet.) Dominant vegetation was determined through application of the 50/20 rule. The Dominance Test and Prevalence Index indicate vegetation at the sample plot is not hydrophytic.
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				

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

Soil

Sampling Point: 013

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8

City/County: Fitchburg/Dane

Sampling Date: 07-May-19

Applicant/Owner: Rettler Corporation

State: WI

Sampling Point: 014

Investigator(s): Havel, Rock

Section, Township, Range: S. 17 T. 6N R. 9E

Landform (hillslope, terrace, etc.): Toeslope

Local relief (concave, convex, none): concave

Slope: 0.0 % / 0.0 °

Subregion (LRR or MLRA): LRR K

Lat.: 42.9991077516166

Long.: -89.4598641741944

Datum: 1983 HARN

Soil Map Unit Name: Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)

NWI classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ☒ No ☐

Are Vegetation ☒ **, Soil** ☒ **, or Hydrology** ☐ **naturally problematic?** (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed and problematic. Soils are also naturally problematic (see vegetation & soil remarks sections). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of 2 required)	
☒ Surface Water (A1) ☒ High Water Table (A2) ☒ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Sparsely Vegetated Concave Surface (B8)	☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes ☒ No ☐ Water Table Present? Yes ☒ No ☐ Saturation Present? (includes capillary fringe) Yes ☒ No ☐	Depth (inches): 0.5 Depth (inches): 0 Depth (inches): 0	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of four primary and one secondary indicator at the sample plot provides evidence of wetland hydrology.			

VEGETATION - Use scientific names of plants

Sampling Point: 014

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
0 = Total Cover			
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
5. _____	0	☐	_____
6. _____	0	☐	_____
7. _____	0	☐	_____
8. _____	0	☐	_____
9. _____	0	☐	_____
10. _____	0	☐	_____
11. _____	0	☐	_____
12. _____	0	☐	_____
0 = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	0	☐	_____
2. _____	0	☐	_____
3. _____	0	☐	_____
4. _____	0	☐	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 0.000

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is > 50%

☐ Prevalence Index is ≤ 3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☒ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. A problematic vegetation situation also exists at the sample plot due to seasonal hydrology - deep water is preventing early vegetation growth. No vegetation was present within the sample plot. The presence of wetland hydrology suggests the presence of hydrophytic vegetation.

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

Soil

Sampling Point: 014

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☒ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A problematic soil situation exists at the sample plot due to seasonal hydrology. The presence of wetland hydrology and location within a concave landscape that appears to pond water for long periods of time suggests a hydric soil is present.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:** 015**Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17

T. 6N

R. 9E

Landform (hillslope, terrace, etc.): Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9980948048247**Long.:** -89.4600035276575**Datum:** 1983 HARN**Soil Map Unit Name:** Elburn silt loam, gravelly substratum, 0 to 3 percent slopes (EgA)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☒ No ☐ (If no, explain in Remarks.)**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?** Yes ☒ No ☐**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). The sample plot is located in an emergent/wet meadow wetland.	

Hydrology

Wetland Hydrology Indicators:		Secondary Indicators (minimum of 2 required)	
Primary Indicators (minimum of one required; check all that apply)			
☒ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☒ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☒ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☒ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☒ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☒ No ☐	Depth (inches):	3
Water Table Present?	Yes ☒ No ☐	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	0
Wetland Hydrology Present? Yes ☒ No ☐			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. The presence of four primary and two secondary indicators at the sample plot provides evidence of wetland hydrology.			

VEGETATION - Use scientific names of plants

Sampling Point: 015

Tree Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Sapling/Shrub Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
		0	= Total Cover	
Herb Stratum	(Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Phalaris arundinacea</i>	5	☒	FACW
2.		0	☐	
3.		0	☐	
4.		0	☐	
5.		0	☐	
6.		0	☐	
7.		0	☐	
8.		0	☐	
9.		0	☐	
10.		0	☐	
11.		0	☐	
12.		0	☐	
		5	= Total Cover	
Woody Vine Stratum	(Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0	☐	
2.		0	☐	
3.		0	☐	
4.		0	☐	
		0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>5</u>	x 2 = <u>10</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>5</u> (A)	<u>10</u> (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

☒ Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is > 50%

☒ Prevalence Index is ≤3.0 ¹

☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation ¹ (Explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall..

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

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation is considered significantly disturbed due to previous agricultural activities. Dominant vegetation was determined through application of the 50/20 rule. Both the Dominance Test and Prevalence Index indicate vegetation at the sample plot is hydrophytic.

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

Soil

Sampling Point: 015

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

The soil at the sample plot matches the A11 (Depleted Below Dark Surface) Indicator described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region**Project/Site:** Parcels 225/0609-172-8501-1 & 225/0609-172-8091-8**City/County:** Fitchburg/Dane**Sampling Date:** 07-May-19**Applicant/Owner:** Rettler Corporation**State:** WI**Sampling Point:****016****Investigator(s):** Havel, Rock**Section, Township, Range:** S. 17**T.** 6N**R.** 9E**Landform (hillslope, terrace, etc.):** Toeslope**Local relief (concave, convex, none):** convex**Slope:** 0.0 % / 0.0 °**Subregion (LRR or MLRA):** LRR K**Lat.:** 42.9978308750744**Long.:** -89.4599767124118**Datum:** 1983 HARN**Soil Map Unit Name:** Plano silt loam, gravelly substratum, 2 to 6 percent slopes (PoB)**NWI classification:** None**Are climatic/hydrologic conditions on the site typical for this time of year?**Yes ☒ No ☐

(If no, explain in Remarks.)

Are Vegetation ☒ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?****Are "Normal Circumstances" present?**Yes ☐ No ☒**Are Vegetation** ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?**

(If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation is considered significantly disturbed (see vegetation remarks section). Normal circumstances are not present due to agricultural activities. The sample plot is located in an upland, fallow field.	

Hydrology

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of 2 required)</u>	
Primary Indicators (minimum of one required; check all that apply)			
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Marl Deposits (B15)	☐ Moss Trim Lines (B16)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dry Season Water Table (C2)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Crayfish Burrows (C8)	
☐ Drift deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Stunted or Stressed Plants (D1)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ Geomorphic Position (D2)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Other (Explain in Remarks)	☐ Shallow Aquitard (D3)	
☐ Sparsely Vegetated Concave Surface (B8)		☐ Microtopographic Relief (D4)	
		☐ FAC-neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes ☐ No ☒	Depth (inches):	
Water Table Present?	Yes ☒ No ☐	Depth (inches):	20
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐	Depth (inches):	15
Wetland Hydrology Present? Yes ☐ No ☒			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: According to the NRCS Rainfall Documentation Worksheet and data from the NRCS WETS Table for the Arboretum Univ WIS Station, precipitation for the three month period prior to field work (February-April) is considered normal. According to the Observed Daily Data for the same station, a total of 3.18 inches of precipitation was recorded in the two weeks prior to fieldwork while 4.41 inches was recorded in the thirty days prior to the site visit (May Normal Range 2.49"-4.66"). Based on this information, climatic/hydrologic conditions for this project area were considered normal for this time of year. No evidence of wetland hydrology was observed at the sample plot.			

VEGETATION - Use scientific names of plants

Sampling Point: 016

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	0	☐	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)
2. _____	0	☐	_____	
3. _____	0	☐	_____	
4. _____	0	☐	_____	
5. _____	0	☐	_____	
6. _____	0	☐	_____	
7. _____	0	☐	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>3</u> x 2 = <u>6</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>2</u> x 4 = <u>8</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>5</u> (A) <u>14</u> (B) Prevalence Index = B/A = <u>2.800</u>
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Hydrophytic Vegetation Indicators: ☐ Rapid Test for Hydrophytic Vegetation ☐ Dominance Test is > 50% ☒ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Definitions of Vegetation Strata: Tree - Woody plants, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine - All woody vines greater than 3.28 ft in height.
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				Hydrophytic Vegetation Present? Yes ☐ No ☒
0 = Total Cover				
0 = Total Cover				
0 = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) Vegetation is considered significantly disturbed due to agricultural activities. Dominant vegetation was determined through application of the 50/20 rule. The Prevalence Index suggests dominance by hydrophytic vegetation; however, the lack of hydrology and hydric soil suggest the vegetation does not meet the hydrophytic vegetation criteria.				

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

Soil

Sampling Point: 016

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

[illegible]

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils : ³

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ☐ Dark Surface (S7) (LRR K, L, M)
- ☐ Polyvalue Below Surface (S8) (LRR K, L)
- ☐ Thin Dark Surface (S9) (LRR K, L)
- ☐ Iron-Manganese Masses (F12) (LRR K, L, R)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

The soil at the sample plot does not meet any of the criteria described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Regions (2012).

G

APPENDIX G

NRCS Remotely Sensed Data Summary

Investigator:James Havel

Date:4/11/2019

County: Dane

***Green Bay A S INTL AP precipitation data & NRCS Method utilized for climate condition (wet, dry, normal) determination

Field data sheet reference if applicable:Project Name: Rettler Corp - O'Brien

Legal Description (S, T, R):Section 17, T 06 N, R 09 E

Key				
WS- Wetland Signature	DO- Drowned Out	AP- Altered Pattern	CS- Crop Stress	
NC- Not Cropped	SS- Soil Wetness Signature	SW- Standing Water	NV- normal healthy crop	NSS- no soil wetness signature
Other labels or comments:	VV- Volunteer Vegetation	Add linear: e.g. "linear SS"		
Inconclusive- unidentifiable				

* Use above key to label interpretations. It is imperative that the reviewer read and understand the guidance associated with the use of these labels. If alternate labels are used, indicate in box above.

* If less than five (5) images taken during normal climate conditions are available, use an equal number of images taken during wet and dry climate conditions and use as many images as you have available. Describe the results using this methodology in your report.

*Key descriptions from Minnesota Board of Water & Soil Resources, Wetland Conservation Act: Using Aerial Imagery to Assess Wetland Hydrology 7/1/10.

Date Image Taken (M/D/Y)	Image Source	Climate Condition (wet, dry, normal)	Image Interpretations		
			Field West of Trail - West 1/2	Field West of Trail - East 1/2	Field East of Trail
7/1/79	FSA	dry	NSS	NV	NSS
7/1/80	FSA	normal	NV	NV	NV
7/1/81	FSA	normal	NV	NV	NV
7/1/82	FSA	normal	NV	NV	NV
7/1/83	FSA	dry	NV	NV	NSS
7/1/84	FSA	wet	Poor Photo	Poor Photo	Poor Photo
7/1/85	FSA	dry	NV	NV	NV
7/1/86	FSA	normal	NV	NSS	NV
7/1/87	FSA	dry	NV	NV	NV
7/1/88	FSA	dry	NV	NV	NV
7/1/89	FSA	dry	NV	NV	NV
7/1/91	FSA	normal	NV	NV	NV
7/1/92	FSA	dry	NV	NV	NV
7/1/93	FSA	wet	NV	DO/SW/SS	NSS
7/1/94	FSA	normal	NV	NSS/NV	NV
7/1/95	FSA	normal	NV	NV	NV
7/1/96	FSA	normal	NSS	NV	NSS
7/1/97	FSA	normal	NV	NV	NV
7/1/98	FSA	wet	NSS	NV	NSS
7/1/99	FSA	normal	NV	NV	NV
7/1/00	FSA	wet	NV	NV	NV
7/1/01	FSA	wet	NSS	NV	NV/NSS
7/1/02	FSA	normal	NV	NV	NV
7/1/03	FSA	normal	NSS	NV	NSS
7/8/04	NAIP	normal	NV	NV	NV
7/15/05	NAIP	dry	NV	NV	NV
7/15/06	NAIP	normal	NV	NV	NV
7/9/08	NAIP	wet	NV	DO/SW/SS	DO/SS
7/1/10	NAIP	wet	NV	DO/SS	NV
8/24/12	Google Earth	dry	NV	NV	NV
7/4/13	NAIP	wet	NV	DO/SW/SS	CS/DO
9/9/15	NAIP	normal	NV	CS/SS	NV
9/3/17	NAIP	normal	NV	CS/DO/SS/VV	CS/DO
10/3/18	Google Earth	wet	NV	SW/CS/DO/SS/VV	SW/VV
			Field West of Trail - West 1/2	Field West of Trail - East 1/2	Field East of Trail
Total Number of Photos			33	33	33
Number of Photos with wet signatures			0	7	4
Percent All Photo with wet signatures			0.0%	21.2%	12.1%
Number of Normal Photos			16	16	16
Number of Normal Photos with wet signatures			0	2	1
Percent Normal with wet signatures			0.0%	12.5%	6.3%

1979 FSA Ortho



0 160 320 Feet

1980 FSA Ortho



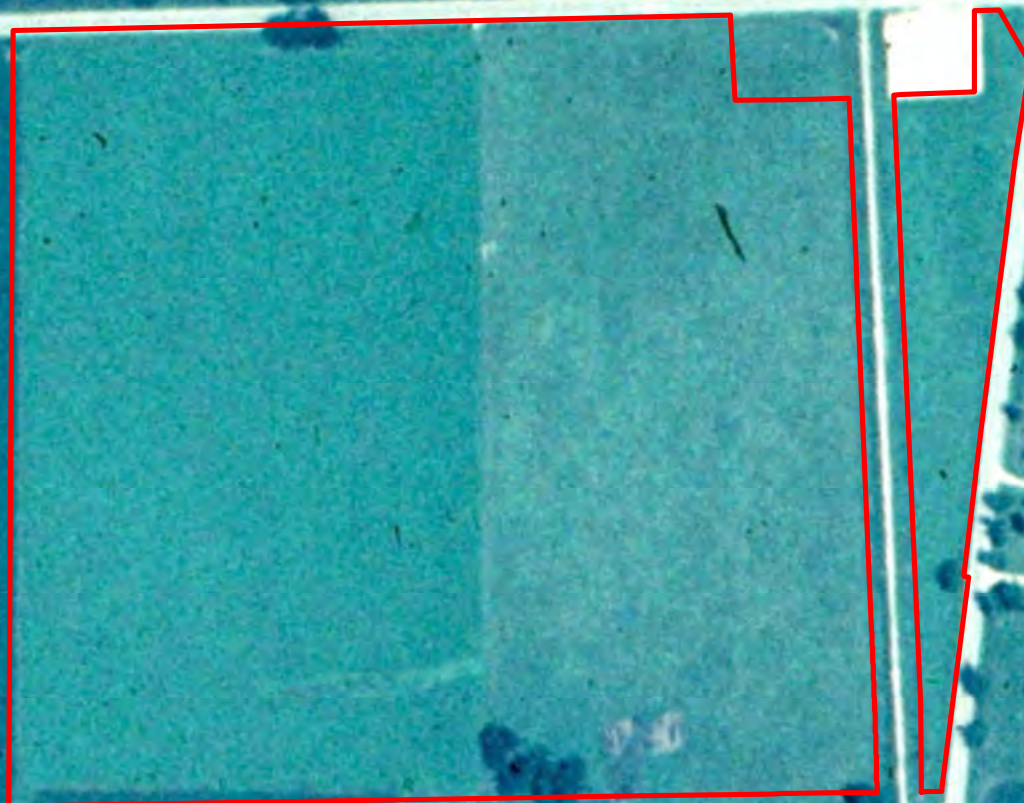
0 160 320 Feet

1981 FSA Ortho



0 160 320 Feet

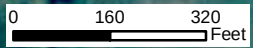
1982 FSA Ortho



0 160 320 Feet

1983 FSA Ortho

0 160 320 Feet



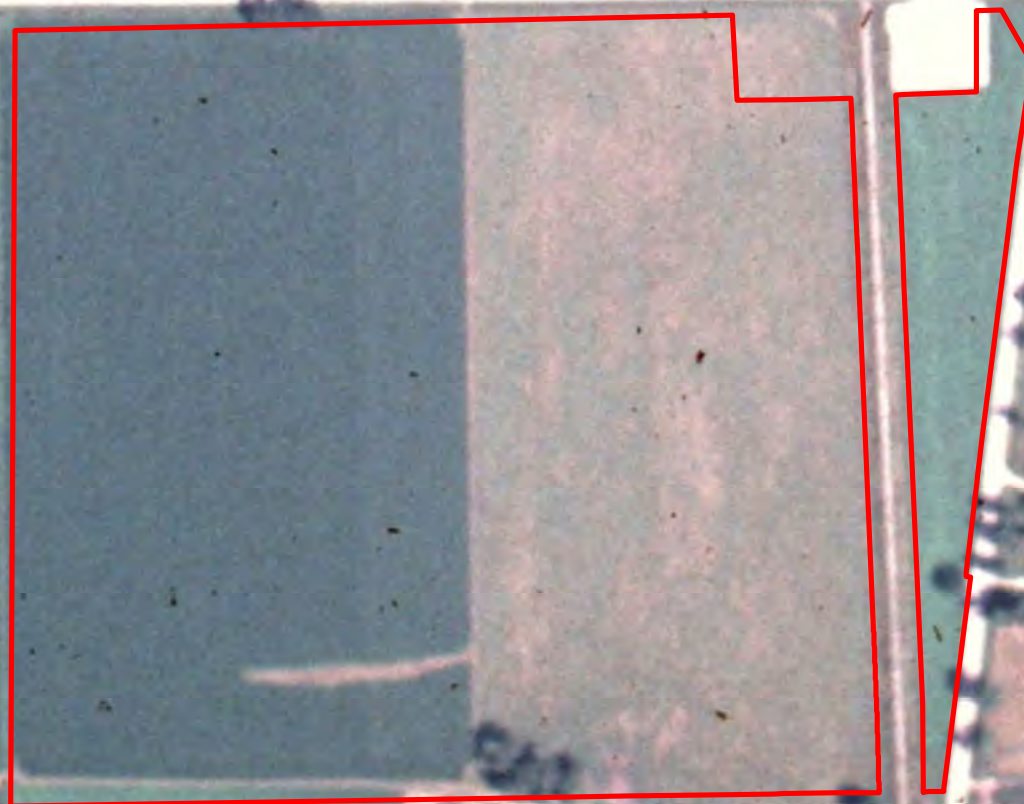
1984 FSA Ortho



1985 FSA Ortho

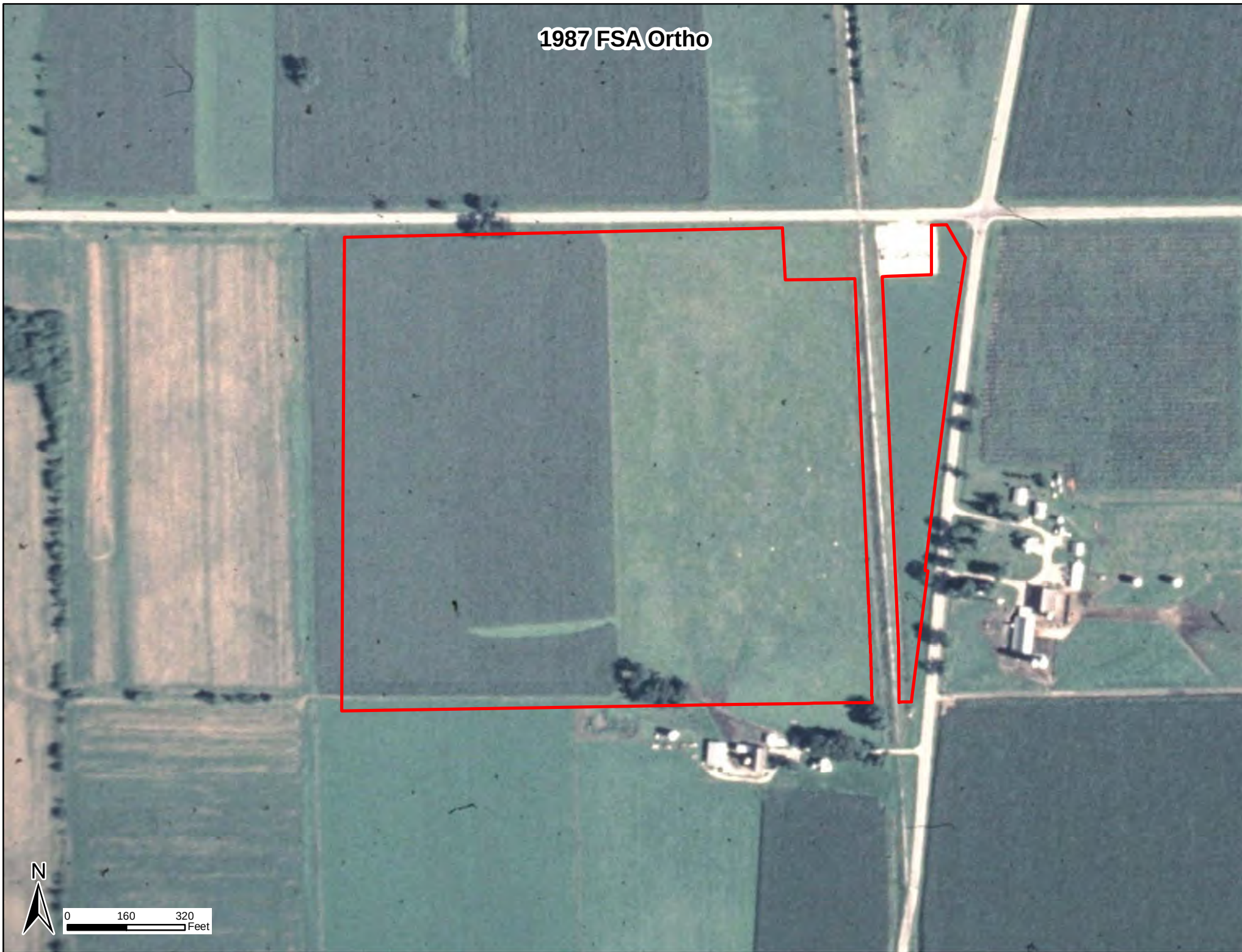


1986 FSA Ortho



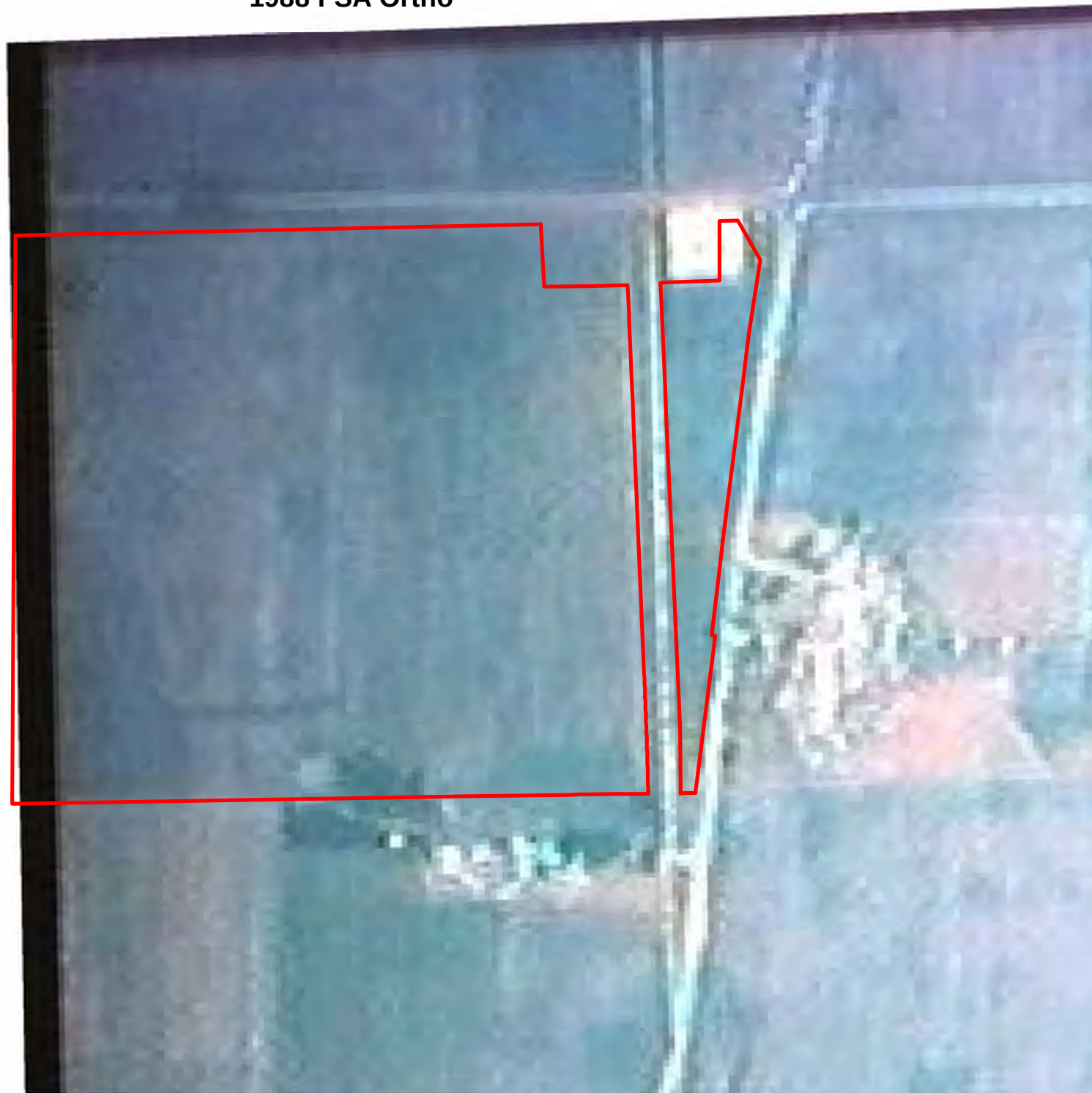
0 160 320 Feet

1987 FSA Ortho



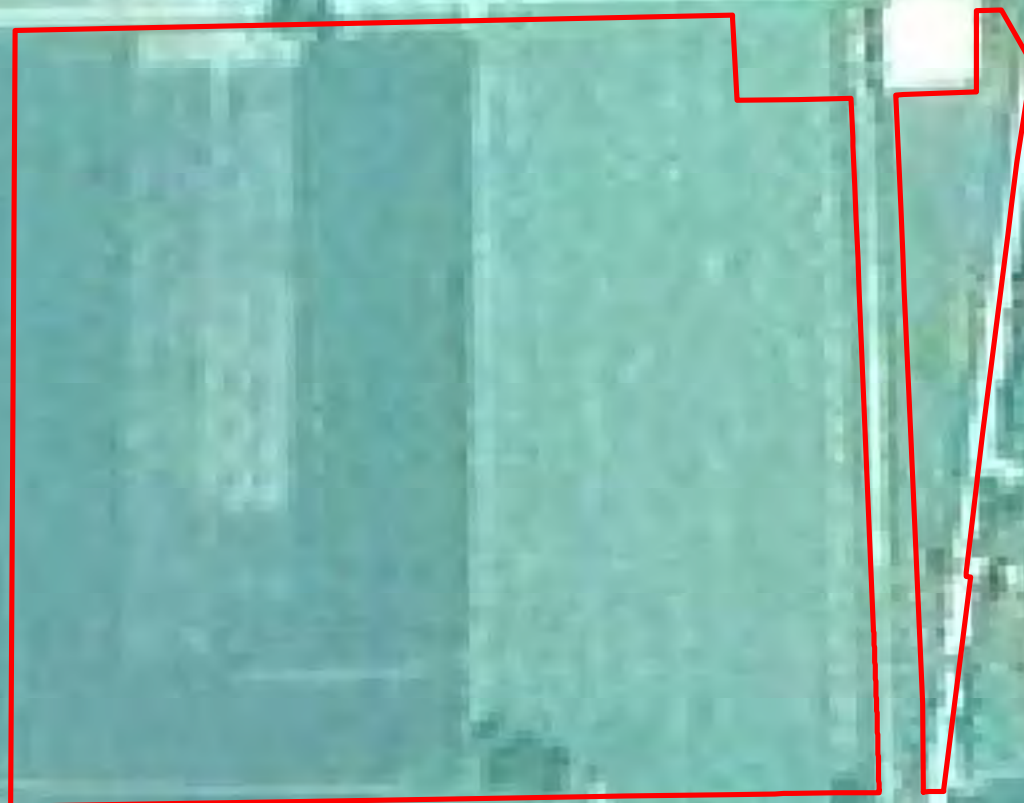
0 160 320 Feet

1988 FSA Ortho



0 160 320 Feet

1989 FSA Ortho



0 160 320 Feet

1991 FSA Ortho



0 160 320 Feet

1992 FSA Ortho

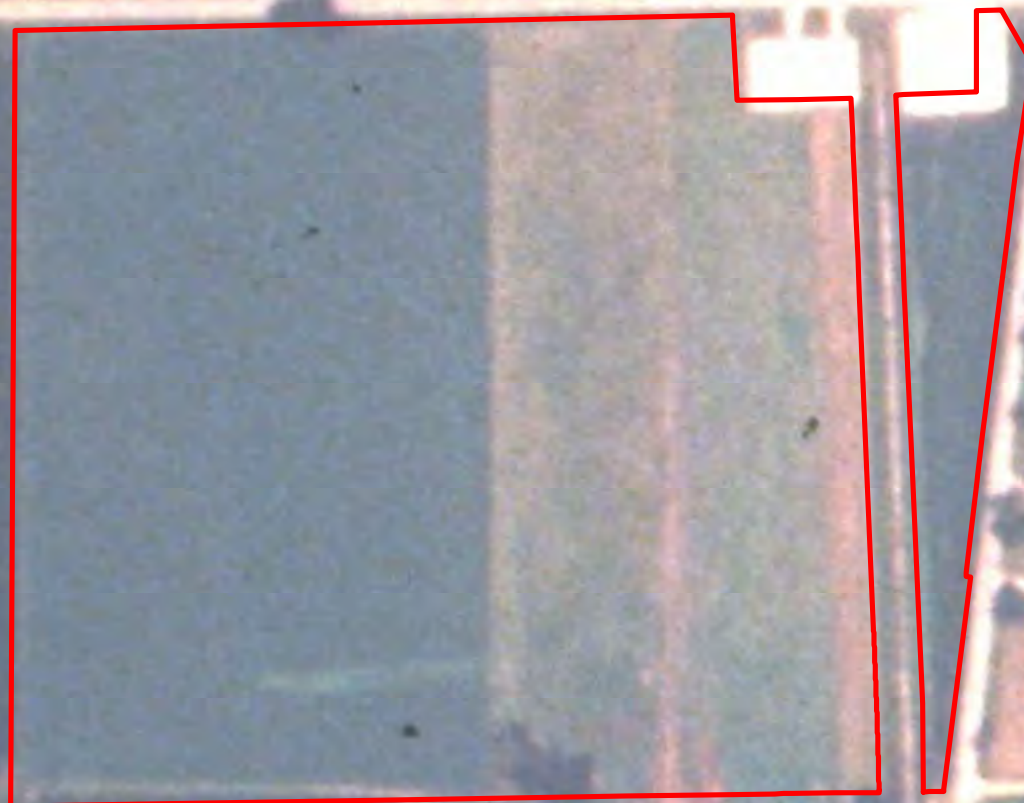


0 160 320 Feet

1993 FSA Ortho



1994 FSA Ortho



0 160 320 Feet

1995 FSA Ortho



1996 FSA Ortho



0 160 320 Feet

1997 FSA Ortho



0 160 320 Feet



1998 FSA Ortho



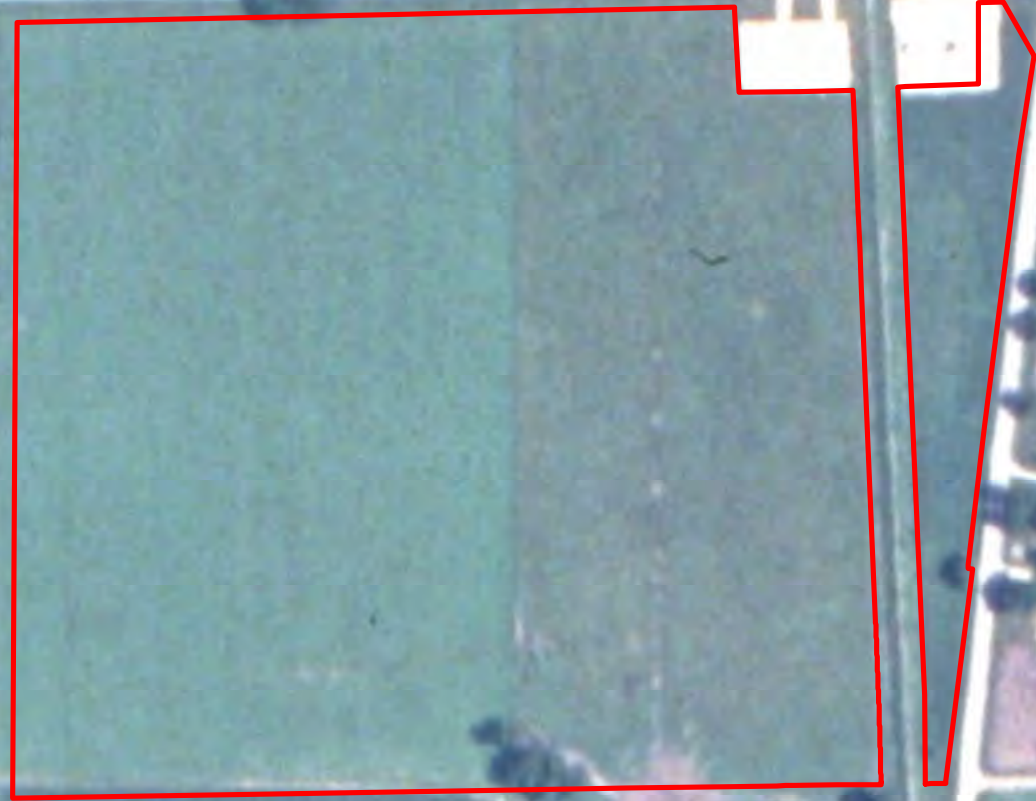
0 160 320 Feet

1999 FSA Ortho



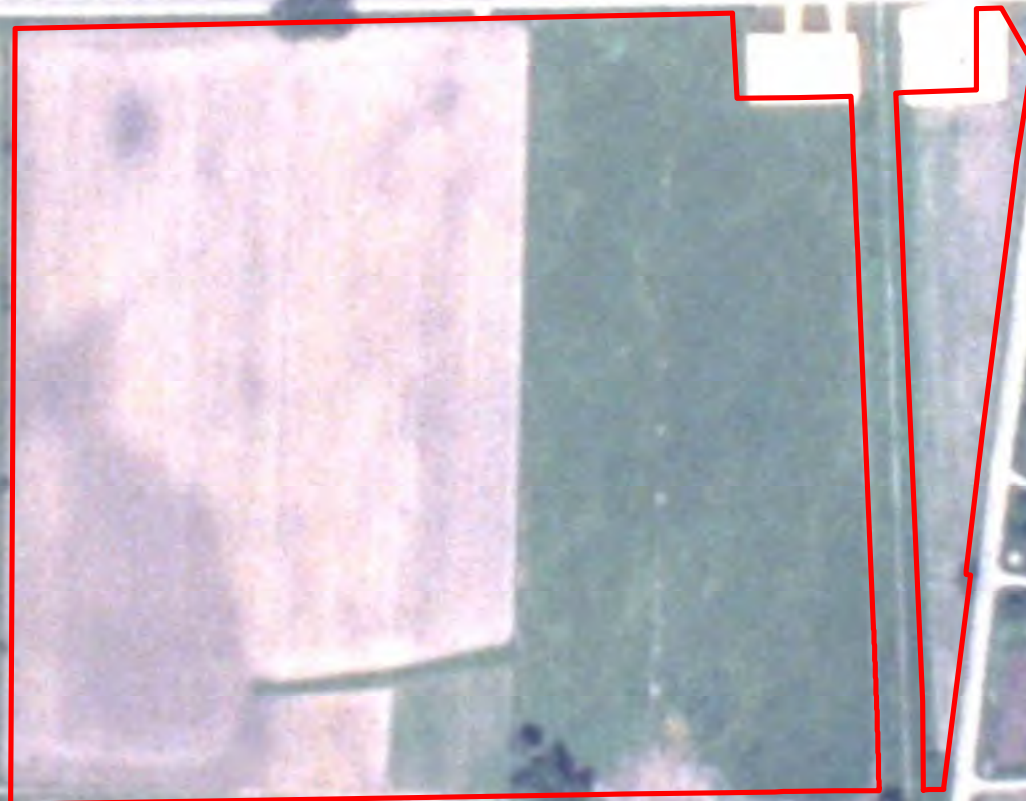
0 160 320 Feet

2000 FSA Ortho



0 160 320 Feet

2001 FSA Ortho



0 160 320 Feet

2002 FSA Ortho



0 160 320 Feet

2003 FSA Ortho



0 160 320 Feet

2004 NAIP Ortho



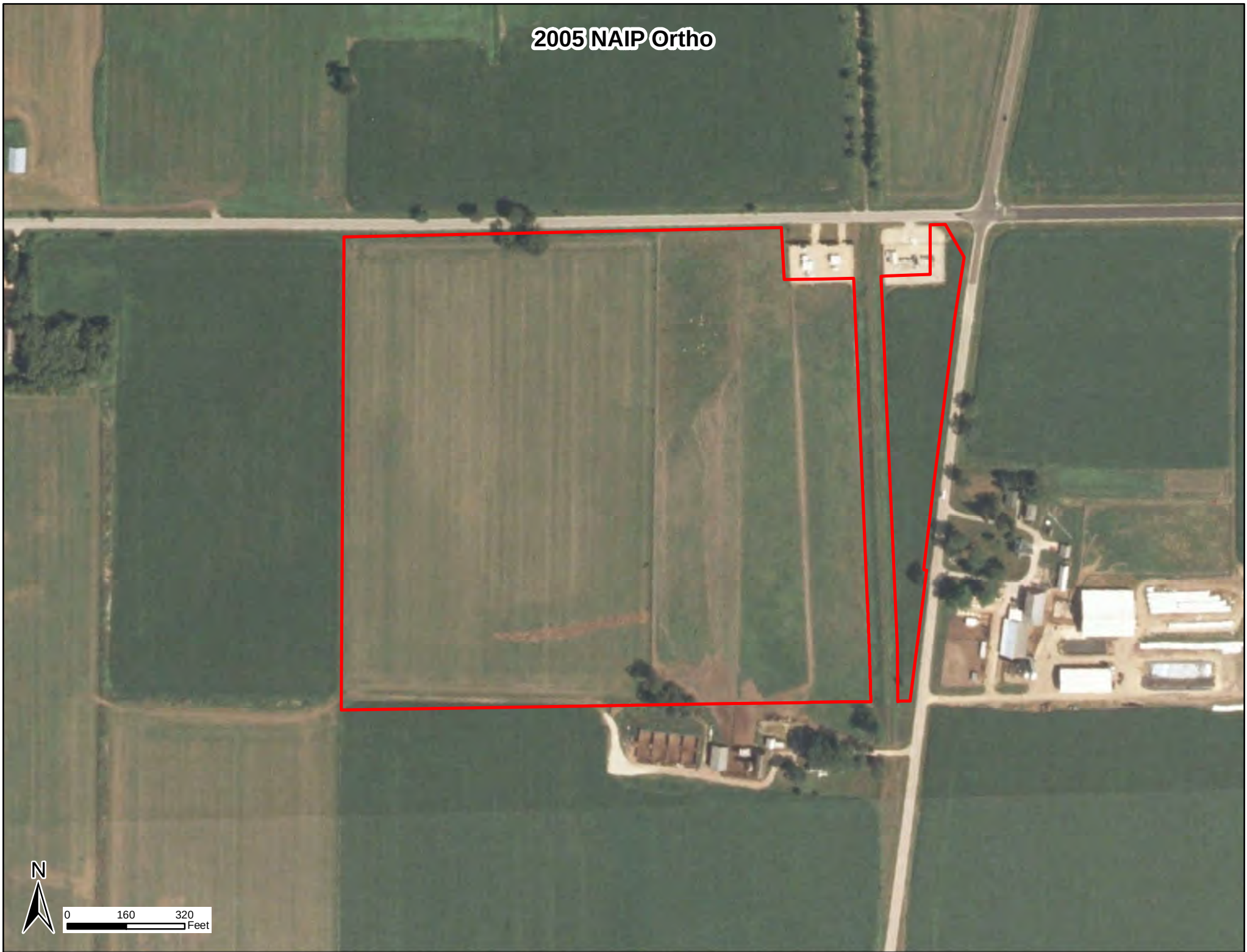
0 160 320 Feet



2005 NAIP Ortho



0 160 320 Feet



2006 NAIP Ortho



0 160 320 Feet

2008 NAIP Ortho



0 160 320 Feet

07-2010 NAIP Ortho



0 160 320 Feet

08-2012 Google Earth Ortho



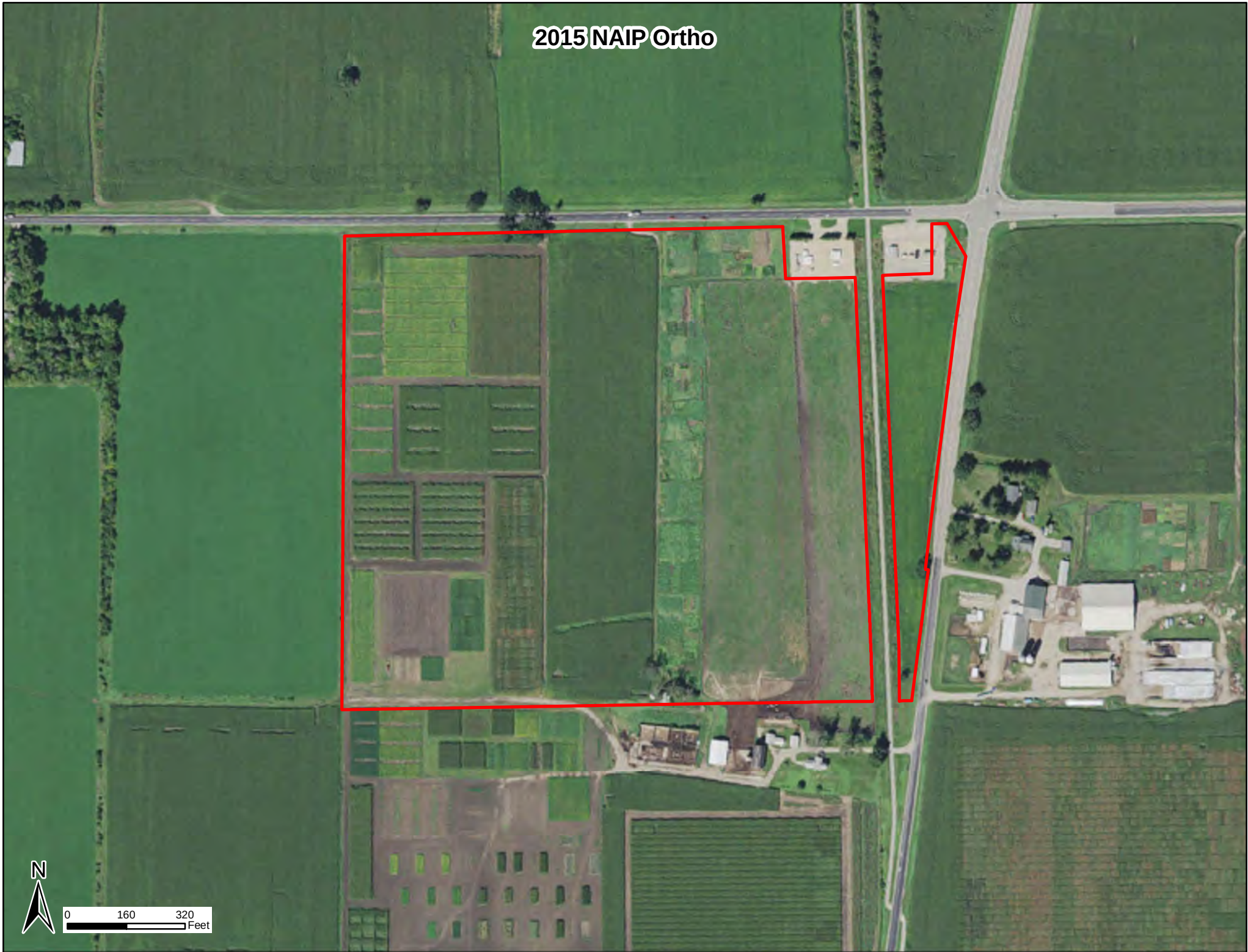
0 160 320 Feet

2013 NAIP Ortho



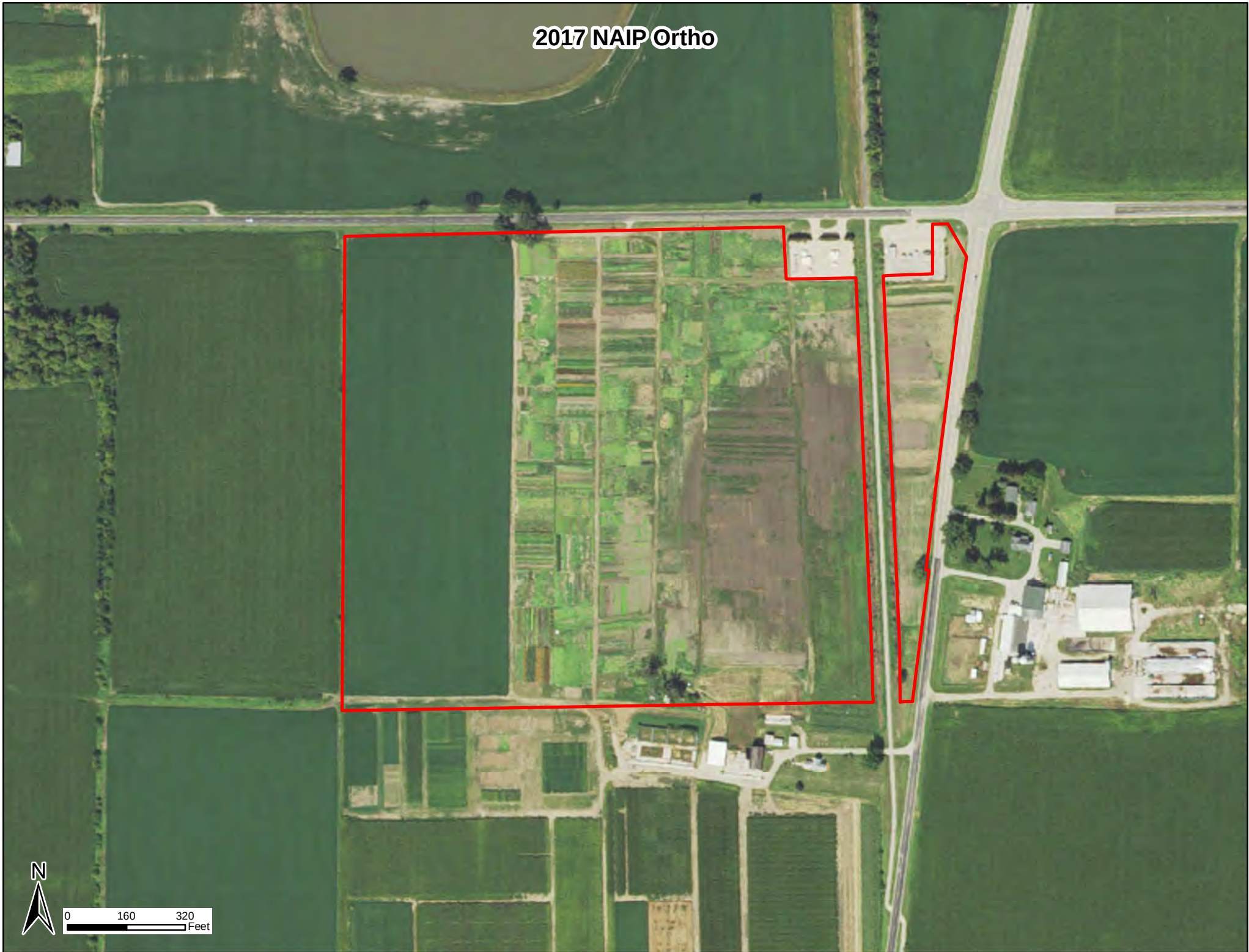
0 160 320 Feet

2015 NAIP Ortho



0 160 320 Feet

2017 NAIP Ortho

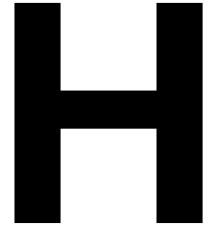


0 160 320 Feet

10-2018 Google Earth Ortho

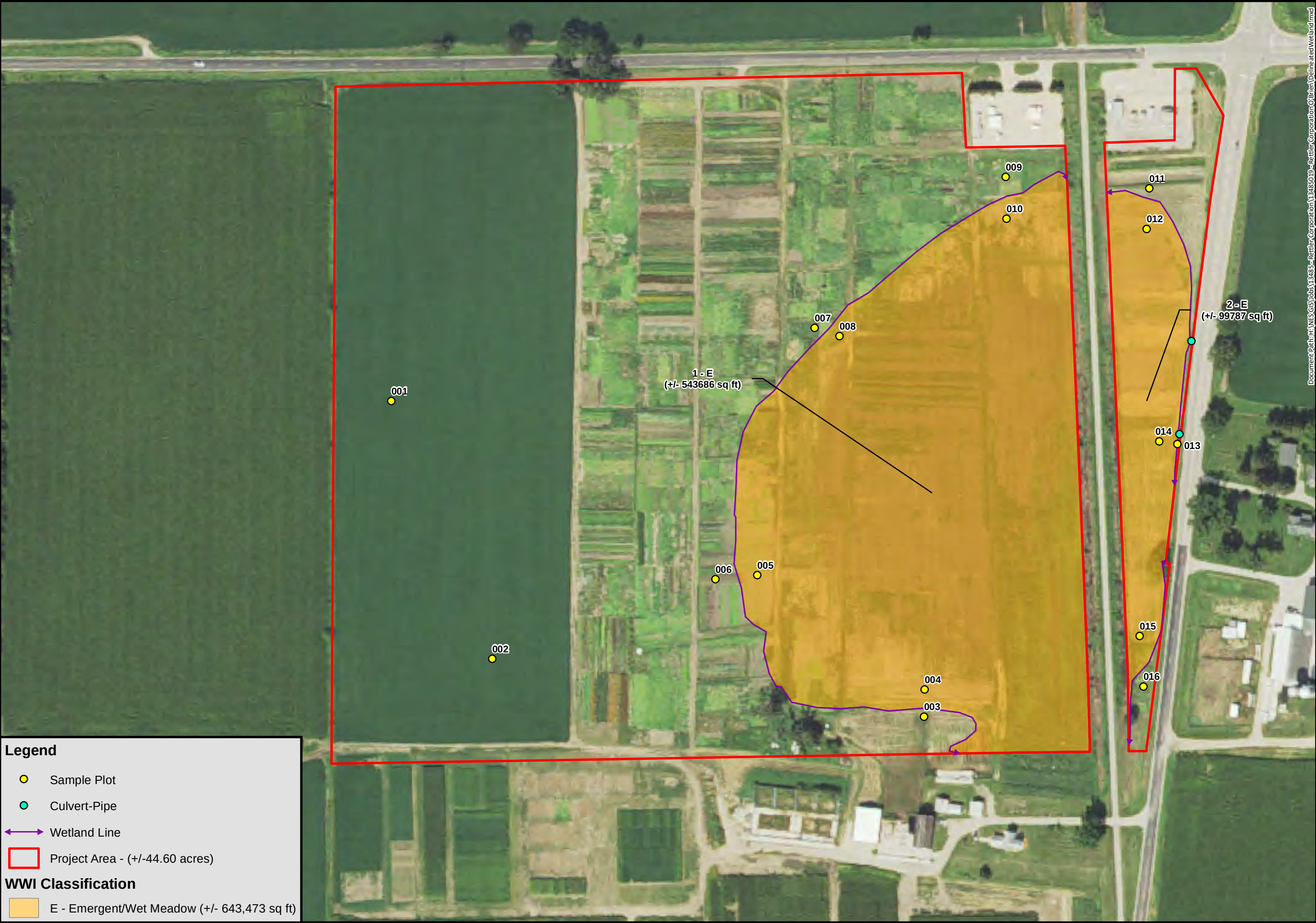


0 160 320 Feet



APPENDIX H

Delineated Wetland Map



Legend

Sample Plot

Culvert-Pipe

Wetland Line

Project Area - (+/-44.60 acres)

WWI Classification

E - Emergent/Wet Meadow (+/- 643,473 sq ft)



ECOLOGICAL SERVICES

A Division of Robert E. Lee & Associates, Inc.

Delineated Wetland

6/12/2019

Rettler Corporation

225/0609-172-8501-1 & 225/0609-172-8091-8

NES Project No. 13485019

City of Fitchburg

Dane County, Wisconsin

Sources: Robert E. Lee & Associates, Inc.,
SOURCES

Disclaimer: Robert E. Lee & Associates, Inc. makes every effort to ensure this map is free of errors but does not warrant the map or its features are either spatially or temporally accurate or fit for a particular use. Robert E. Lee & Associates, Inc. provides this map without any warranty of any kind whatsoever, either expressed or implied.

N

0

170 Feet

Document Path: H:\NES-GIS\Jobs\13485-Rettler Corporation\13485019-Delineated Wetland.mxd



APPENDIX I

NR 151 Wetland Susceptibility Classifications

	Wetland Category for NR 151 Stormwater Permitting		
Wetland Feature	Highly Susceptible¹	Moderately Susceptible²	Less Susceptible³
Wetland 1			X
Wetland 2			X

For each category, the below include but are not limited to these communities.

¹ Calcareous fens, sedge meadows, open & coniferous bogs, low prairies, coniferous swamps, lowland hardwood swamps and ephemeral ponds. Outstanding and exceptional resource waters such as trout streams are also included.

² Scrub-Shrub, floodplain forests, fresh wet meadows, deep/shallow marshes and early successional forested wetlands. Perennial and intermittent streams and lakes are also included.

³ Wetlands dominated by >90% invasive species cover.

The “Guidance for the Establishment of Protective Areas for Wetlands in Runoff Management Rules, Wisconsin Administrative Code NR 151” (Guidance Document #3800-2015-02) published by the WDNR was utilized to develop the above table. NES placed each wetland or portion of a wetland complex into one of the above categories based on the wetland delineation field work conducted on-site by our ecologists and our professional opinion regarding the current condition of each feature. Although NES has provided guidance regarding the status of each, the WDNR has the ultimately decision regarding their classification.



ECS Midwest, LLC

Geotechnical Engineering Report

48 Acre Parcel

SW Corner of Lacy Road and S. Seminole Highway Intersection
Fitchburg, Wisconsin

ECS Project Number 59:1604-A

March 15, 2019





ECS MIDWEST, LLC

Geotechnical • Construction Materials • Environmental • Facilities

"Setting the Standard for Service"

March 15, 2019

Mr. John Kneer
Rettler Corporation
3317 Business Park Drive
Stevens Point, WI 54482
Email: jkneer@rettler.com

ECS Project No. 59:1604-A

Reference: Geotechnical Engineering Report
48 Acre Parcel
SW Corner of Lacy Road and S. Seminole Highway Intersection
Fitchburg, Wisconsin

Dear Mr. Kneer:

ECS Midwest, LLC (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our Proposal No. 59:1323-GP, dated December 19, 2018. This report presents our understanding of the geotechnical aspects of the project, the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to you on this project. We would appreciate the opportunity to continue our services during design and provide our services during construction to verify the assumptions of subsurface conditions made for this report. Please contact us should you have any questions about the information contained in this report, or if we can be of further assistance to you.

Respectfully submitted,

ECS Midwest, LLC



Darin M. Maciolek, P.E.
Principal Geotechnical Engineer
DMaciolek@ecslimited.com

Matthew A. Meyer, P.E.
Geotechnical Department Manager
MMeyer@ecslimited.com

I:\{Projects\}\D3 GEO\1716 (59 1604-A) 48 Acre Parcel Fitchburg WI\7 Report\59 1604-A 48 Acre Parcel Fitchburg WI.DOCX

TABLE OF CONTENTS

1.0	INTRODUCTION.....	2
1.1.	General	2
1.2.	Scope of Services	2
1.3.	Authorization	2
2.0	PROJECT INFORMATION	3
2.1.	Project Location	3
2.2.	Past Site History/Uses.....	3
2.3.	Current Site Conditions.....	3
2.4.	Proposed Construction	4
3.0	FIELD EXPLORATION	5
3.1	Field Exploration Program	5
3.2	Regional/Site Geology	6
3.3	Soil Survey Mapping	7
3.4	Subsurface Characterization.....	8
3.5	Groundwater Observations	9
4.0	LABORATORY TESTING	10
5.0	DESIGN RECOMMENDATIONS	11
5.1.	Preliminary Building Design.....	11
5.1.1.	Foundations	11
5.1.2.	Floor Slabs.....	12
5.1.3.	Below-Grade Basement Walls	14
5.1.4.	Site Retaining Walls	17
5.2.	Pavement Design Considerations	18
6.0	SITE CONSTRUCTION RECOMMENDATIONS	22
6.1.	Subgrade Preparation.....	22
6.1.1.	Stripping and Grubbing.....	22
6.1.2.	Proofrolling	22
6.1.3.	Subgrade.....	24
6.1.4.	Site Temporary Dewatering.....	24
6.2.	Earthwork Operations	25
6.2.1.	Engineered Fill Materials	25
6.2.2.	Compaction.....	26
6.3.	Foundation and Slab Observations.....	27
6.4.	Utility Installations.....	28
6.5.	General Construction Considerations.....	29
7.0	CLOSING	31

APPENDICES

Appendix A – Drawings & Reports

- Boring Location Diagram

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Test Boring Logs B-1 through B-11

Appendix C – Supplemental Report Documents

- Important Information about This Geotechnical-Engineering Report

EXECUTIVE SUMMARY

This executive summary is solely provide to give a brief overview of the project findings. The summary is abbreviated. Information gleaned from the Executive Summary should not be utilized in lieu of reading the entire geotechnical report.

- The geotechnical exploration included eleven test borings, each drilled to an approximate depth of 15 feet.
- The surficial materials at the test boring locations consisted of approximately 5 to 18 inches of topsoil. The surficial materials were underlain by lean clay and sandy lean clay to approximate depths of 3 to 8 feet below existing site grade. Below the lean clay and sandy lean clay at the borings was native sand, sand with clay/silt, silty sand, and sandy silt to a depth of 15 feet below grade (i.e., termination depth of the test borings). The static water table appears to be at an approximate depth of 3 to 10 feet (approximately EL. 281 to EL. 287.5 feet) at the time of the exploration.
- A shallow foundation system bearing in competent native soils, or bearing on engineered fill or lean concrete overlying competent native soils may be designed for a maximum, net, allowable bearing pressure of 1,500 to 4,000 psf depending on location and bearing elevation. Undercut and/or dewatering may be needed depending on the final site grades.
- The design and construction of the slabs-on-grade for the buildings is recommended to follow the recommendations provided in the sections entitled **Subgrade Preparation** and **Earthwork Operations**. The building floor slab thicknesses may be determined based on an assumed modulus of subgrade reaction of 75 to 150 pounds per cubic inch (pci) depending on the subgrade soils. We recommend the slabs be designed with a minimum thickness of 5 inches.
- Below-grade walls should be designed as restrained retaining walls to resist at-rest earth pressures and other lateral pressures imposed on the walls, such as surcharge loads. A drainage system should surround the below-grade walls and underlie the below-grade floor slab.
- ECS recommends designing site cast-in-place cantilever walls based on appropriate earth pressures plus any surcharges. We recommend the walls be backfilled with a free-draining granular material as recommended in the **Site Retaining Walls** section of this report.
- The minimum recommended pavement sections are 3½ inches of hot mix asphalt (HMA) over 9 inches of base course in light duty areas, and 4½ inches of HMA over 10 inches of base course or 6 inches of PCC over 6 inches of base course in heavy duty areas. We recommend pavements in high stress areas, such as entrance/exit aprons, drive-thru lanes, at trash enclosures, loading docks and in areas where trucks will turn or will be parked, utilize the heavy duty rigid pavement section alternative.
- A comprehensive subsurface exploration, possibly including water level observation wells, and a geotechnical engineering analysis is recommended to be performed after specific details of the development are known to further define the subsurface conditions, and provide more specific recommendations regarding design of the foundations, floor slabs, basement walls and other planned development features. This report includes only preliminary recommendations and is not intended to be used for the final design.

1.0 INTRODUCTION

1.1. GENERAL

The purpose of this report is to provide the results of our subsurface exploration and laboratory testing, engineering analyses, and geotechnical recommendations for the design of foundations, floor slabs, site retaining walls, below-grade walls and pavements for the proposed development. Also included are geotechnical subgrade preparation, fill placement and general dewatering recommendations.

1.2. SCOPE OF SERVICES

Eleven test borings were performed on a general grid within the parcel. A laboratory testing program was also implemented to help characterize the physical and engineering properties of the subsurface soils.

This report contains a description of the exploratory and testing procedures, presents our findings and evaluations, and includes the following.

- A brief description of the field and laboratory test procedures and results.
- A description of the observed surface topographical features and site conditions.
- A description of area and site geologic conditions.
- A description of the interpreted subsurface soil stratigraphy with pertinent available physical properties.
- Copies of our subsurface exploration (test boring logs).
- Foundation recommendations.
- General ground-supported floor slab design recommendations, including a recommended design subgrade modulus value.
- Recommended seismic Site Class.
- Recommendations for design of below-grade (basement) walls.
- Recommendations for design of loading dock retaining walls.
- General pavement design recommendations, including a recommended design CBR value.
- Recommendations for site preparation and construction of engineered fills, including an evaluation of on-site soils for use as engineered fills, and delineation of potentially unsuitable soils and/or soils exhibiting excessive moisture at the time of sampling.
- General recommendations relative to groundwater.

1.3. AUTHORIZATION

Our services were provided in accordance with our Proposal No. 59:1323-GP, dated December 19, 2018, as authorized by you, and includes the Terms and Conditions of Service outlined with our Proposal.

2.0 PROJECT INFORMATION

2.1. PROJECT LOCATION

The project site is located at the southwest corner of the Lacy Road and S. Seminole Highway intersection in Fitchburg, Dane County, Wisconsin. The subject property is bound to the north by Lacy Road, to the south by farmland, to the east by Seminole Highway and to the west by farmland. The site location is shown below.

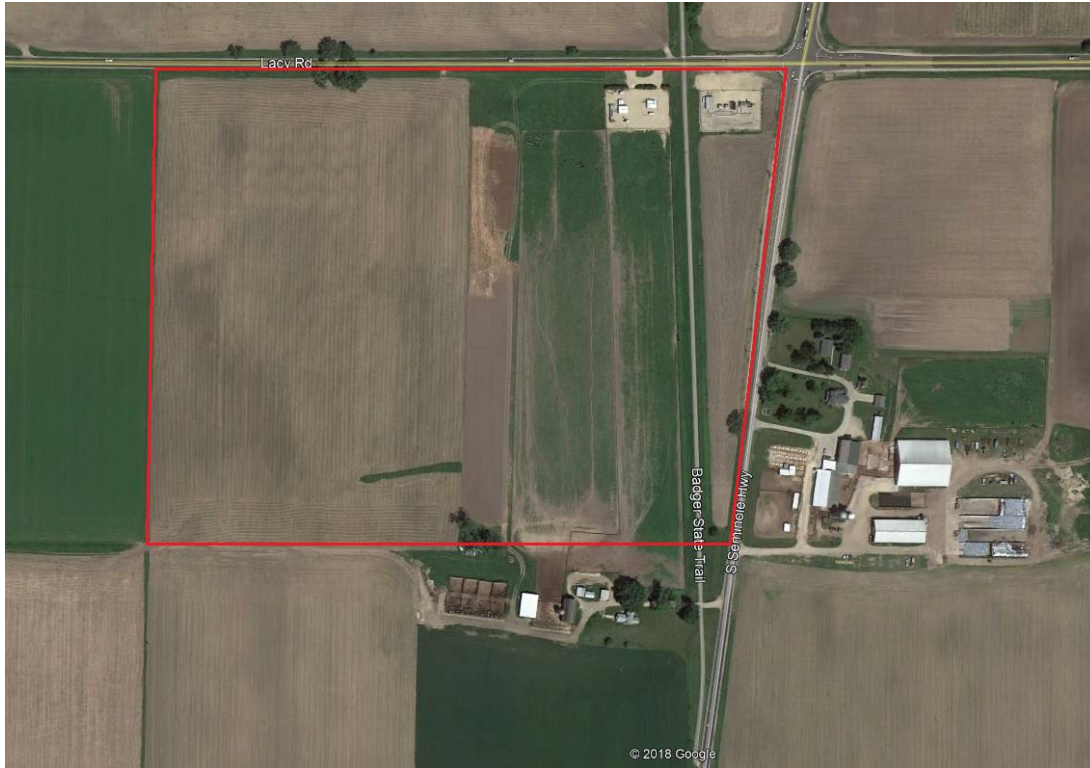


Figure 2.1.1 Site Location

2.2. PAST SITE HISTORY/USES

ECS reviewed aerial photographs of the general project area, dated 1992, 2000, 2005, 2006, 2008, 2010, 2012, 2013, and 2014. The project area appeared to be relatively unchanged during this time period and most of the area appeared to be agricultural field with a central area with lower elevation which appears to have been used as cow pasture.

2.3. CURRENT SITE CONDITIONS

The site currently consists of predominantly agricultural fields and cow pasture. The general site topography is relatively flat to gently rolling terrain and the grade slopes gradually downward toward the pasture and field located within approximately 600 feet west of the Badger State Trail. The ground surface elevations at the test boring locations varied from approximately EL. 289.6 to EL. 300.4 feet, referenced to the temporary benchmark shown on the Boring Location Diagram in Appendix A.

2.4. PROPOSED CONSTRUCTION

We understand that specific details for the planned construction are not currently available. However, we anticipate the site development will likely consist of one to two-story buildings, some of which may have basements. The development is also expected to include paved parking lot and drive areas.

At the time this report was written, the structure loads and finished floor elevations (FFE) were not available. It is assumed building loads will not exceed 4 kips per lineal foot on walls and 150 kips on columns. It is assumed the maximum floor live loads will be 100 to 200 psf. The settlement tolerance of the proposed structures was not provided, but is assumed to be 1-inch total and ½ inch differential.

The development will also include paved parking and drive lanes. The expected traffic was not provided to us. Therefore, it was necessary for us to use arbitrarily-selected design traffic volumes. We assumed a maximum daily traffic volume of 500 automobiles, and truck traffic consisting of 20 daily 18,000-pound equivalent single-axle loads (ESALs) for heavy duty pavement areas, and a maximum daily traffic volume of 200 automobiles, and truck traffic consisting of 5 daily 18,000-pound ESALs for light duty pavement areas.

If ECS' understanding of the project is not correct or the design changes, especially if the structural loads or elevations are different, please contact ECS so that we may review these changes and revise our recommendations, as appropriate.

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was planned with the objective of characterizing the subsurface conditions in general geotechnical and geological terms, and to evaluate field and laboratory data to assist in the development of geotechnical design and construction recommendations.

ECS used a measuring tape/wheel to identify boring locations in the field relative to existing site features. These staked locations were then referenced using a handheld GPS. The approximate as-drilled test boring locations are shown on the Boring Location Diagram in Appendix A. ECS determined the ground surface elevations noted on the boring logs using conventional level techniques and referenced the elevations to a mag nail in the power pole located approximately 1,050 feet west of the Lacy Road and Seminole Highway intersection. We assumed an Elevation of 300.0 feet for this temporary benchmark. The approximate location of the temporary benchmark is shown on the Boring Location Diagram.

Prior to drilling, ECS contacted the State of Wisconsin Utility One-Call Center, Digger's Hotline, to clear and mark underground utilities in the vicinity of the project site. After utilities had been located and marked, ECS advanced eleven test borings at the site on March 1, 2019. The drillers advanced each test boring to an approximate depth of 15 feet below existing site grade utilizing an all-terrain vehicle (ATV)-mounted drilling rig equipped with continuous flight hollow stem augers.

Standard penetration tests (SPTs) were conducted in the test borings at regular intervals in general accordance with ASTM D 1586. Small representative samples obtained during these tests were collected and used to classify the soils. The obtained SPT resistances (N-values) provide a general indication of soil relative density and consistency.

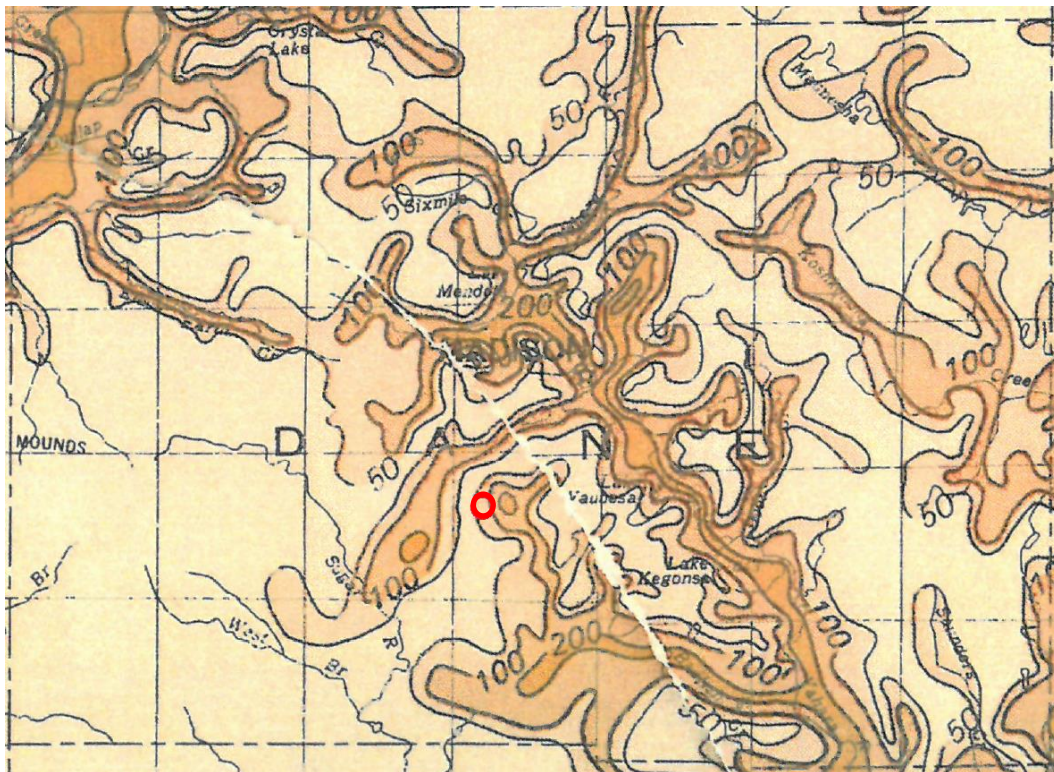
Immediately after sampling, the drillers retained select portions of the SPT samples in clean jars that were labeled at the site for identification. After the completion of drilling, ECS transported the retained SPT samples to our laboratory for classification and laboratory testing.

The drill crew backfilled the boreholes at completion of drilling. Borehole backfill settlement or expansion can and will occur throughout time. Monitoring the boreholes after the initial drilling activities is not within our scope. Settlement or expansion of the borehole backfill can create a hazard and should be carefully monitored by the client or property owner.

3.2 REGIONAL/SITE GEOLOGY

Based on the University of Wisconsin Extension Geological and Natural History Survey and U.S. Geological Survey^{1,2} the site of the proposed construction is underlain by Phanerozoic bedrock of the mid to late Paleozoic Age. The bedrock generally consists of orthoquartzitic sandstone with minor limestone, shale, and conglomerate.

The soil overburden varies from 50 to 100 feet thick and these soils generally consist of loess over outwash deposits of mostly silt and lean clay over sand and gravel. The depth to bedrock profile is illustrated in Figure 3.2.1. The approximate site location is marked with a red circle.



Depth to Bedrock Geologic map obtained from the University of Wisconsin Extension Geological and Natural History Survey¹.

Figure 3.2.1

¹ Trotta, L.C. and Cotter, R.D. *Depth to Bedrock in Wisconsin*. University of Wisconsin Extension Geological and Natural History Survey, U.S. Geological Survey, USGS, 1973.

² Mudrey, M.G., Brown B.A., and Greenburg, J.K. *Bedrock Geologic Map of Wisconsin*. University of Wisconsin Extension Geological and Natural History Survey, 1982.

3.3 SOIL SURVEY MAPPING

Based on the Soil Survey (USDA - Natural Resources Conservation Service Web Soil Survey: websoilsurvey.nrcs.usda.gov), which provides soil information to a shallow (generally less than 5 feet) depth, the site soils as mapped are described as follows.

- Kegonsa silty loam (KeB) – Loess over sandy and gravelly outwash soils. Near surface soils generally consist of a surface layer of silt or lean clay overlying lean clay to a depth of about 2 to 3 feet and then well graded gravelly coarse sand. Approximately 40% of the AOI. Well drained with groundwater often deeper than 6 feet below the ground surface. This soil series typically consists of soils having an AASHTO Classification of "A-4" and "A-6" in the upper 2 to 3 feet, and then "A-1-b", and are in hydrologic soil group B.
- Elburn silt loam (EgA) – Loess over sandy and gravelly outwash soils. Near surface soils generally consist of a surface layer of silt overlying lean clay to a depth of about 4 feet and then gravel with silt and sand. Approximately 31% of the AOI. Somewhat poorly drained with groundwater often within 6 feet of the ground surface. This soil series typically consists of soils having an AASHTO Classification of "A-4" and "A-7-6" in the upper 3 feet, "A-2-4" to about 4 feet and then "A-1-a", and are in hydrologic soil group C.
- Plano silt loam (PoB) – Loess over loamy outwash over sandy and gravelly outwash soils. Near surface soils generally consist of a surface layer of silt overlying silt and lean clay to a depth of about 4 feet below grade. Below 4 feet the soil profile generally consists of a thin layer of clayey gravel, lean clay, or silty clayey sand and then gravel with silt, gravel with sand, sand with silt, or sand. Approximately 11% of the AOI. Well drained with groundwater often deeper than 6 feet below the ground surface. This soil series typically consists of soils having an AASHTO Classification of "A-4", "A-6", "A-7-6", and "A-7" in the upper 4 to 5 feet and then "A-1" and "A-3", and are in hydrologic soil group B.
- Radford silt loam (RaA) – Silty alluvium soils. Near surface soils generally consist of a surface layer of silt overlying lean clay and silt to about 5 feet and then silty clay. Approximately 10% of the AOI. Somewhat poorly drained with groundwater often within 6 feet of the ground surface. This soil series typically consists of soils having an AASHTO Classification of "A-4" and "A-6", and are in hydrologic soil group B/D.
- Plano silty loam (PoA) – Loess over loamy outwash over sand and gravelly outwash soils. Near surface soils generally consist of a surface layer of silt overlying silt and lean clay to a depth of about 4 feet below grade. Below 4 feet the soil profile generally consists of a thin layer of clayey gravel, lean clay, or silty clayey sand and then gravel with silt, gravel with sand, sand with silt, or sand. Approximately 8% of the AOI. Well drained with groundwater often deeper than 6 feet below the ground surface. This soil series typically consists of soils having an AASHTO Classification of "A-4", "A-6", "A-7-6", and "A-7" in the upper 4 to 5 feet and then "A-1" and "A-3", and are in hydrologic soil group B.

Soil mapping of the site vicinity is presented in Figure 3.3.1 below.



(Source: USDA - Natural Resources Conservation Service Web Soil Survey: websoilsurvey.nrcs.usda.gov)

Figure 3.3.1 Soil Survey Information

3.4 SUBSURFACE CHARACTERIZATION

The observed subsurface conditions were generally consistent with published geological mapping. Listed in Table 3.4.1 is a generalized characterization of the soil and rock strata encountered at the test boring locations. Refer to the Boring Logs in Appendix B for subsurface information at a specific test boring location.

Table 3.4.1 Generalized Subsurface Stratigraphy

Approximate Depth Below Grade (feet)	Strata	Description	SPT ⁽¹⁾ N-value Range (bpf)	Unconfined Compressive Strength ⁽²⁾ (tsf)
Surface	--	Topsoil (5" to 18" ±)	N/A	N/A
2½ - 3	I	Crop Tillage: Lean clay (CL), very soft to very stiff	2 - 7	1.25 - 2.5
3½ - 4½	II	Loess: Lean clay (CL), firm to very stiff	5 - 8	1.5 - 3.5
2½ - 8	III	Glacial Outwash: Sandy lean clay, lean clay with silt (CL), firm to very stiff	4 - 9	1 - 3.5
15	IV	Glacial Outwash: Sand, sand with clay, sand with silt, silty sand, sandy silt (SP, SP-SC, SP-SM, SM, ML)	1 - 19	N/A

1. Standard Penetration Test.

2. Estimated from calibrated hand penetrometer (pocket penetrometer).

One exception to the generalized profile in Table 3.4.1 occurred in Boring B7 and B8 which encountered layers of alluvium consisting of lean clay/sandy lean clay, silty fine sand, clayey fine sand and sand with clay to approximate depths of 3½ and 5½ feet and then glacial outwash deposits extended to the boring termination depths. One other exception to the above profile

occurred in Boring B8 which encountered an approximate 2-foot thick layer of organic lean clay (swamp deposit) between the alluvium and glacial outwash. Further, Boring B2, B3 and B5 through B9 did not encounter crop tillage below the topsoil, and Boring B4 and B7 through B11 did not encounter loess deposits.

The soil stratification shown on the boring logs represents the interpreted soil conditions at the actual boring locations. Variations in the stratification can occur between sample intervals and between boring locations. The subsurface conditions at other times and locations on the site may differ from those found at the boring locations. If different site conditions are encountered during construction, ECS should be contacted to review our recommendations relative to the new information.

3.5 GROUNDWATER OBSERVATIONS

The drillers observed the boreholes for the presence of water during drilling and at the completion of drilling. A summary of the free water levels observed at the boring locations are listed in Table 3.5.1 and on the boring logs in Appendix B.

Table 3.5.1 Subsurface Water Observations

Boring	During Drilling		At Completion	
	Depth (feet)	Elevation	Depth (feet)	Elevation
B1	--	--	15±	285.4±
B2	15±	282.2±	--	--
B3	9±	284.1±	--	--
B4	8±	280.7±	3±	286.7±
B5	10±	281.8±	--	--
B6	10±	287.3±	--	--
B7	10±	287.5±	--	--
B8	10±	281.2±	--	--
B9	10±	279.6±	7±	282.6±
B10	6±	284.2±	--	--
B11	6±	284.2±	--	--

Based upon our interpretation of the test boring observations, it appears that the static groundwater level may be found at an approximate depth of 3 to 10 feet below grade at the test boring locations, or approximately EL. 281 feet to EL. 287.5 feet.

Variations in the long term water table elevation may occur as a result of changes in precipitation, evaporation, surface water runoff, construction activities, and other factors. Perched water conditions may also develop and/or exist at shallower depths seasonally, particularly within more permeable soil underlain by less permeable soil.

4.0 LABORATORY TESTING

The laboratory testing performed by ECS consisted of select tests performed on representative soil samples retained from the field exploration to aid classification of the soils, and to help estimate engineering properties. Described in the following paragraphs is the completed laboratory testing program.

A geotechnical engineer visually classified each soil sample retained from the test borings on the basis of texture and plasticity using the Unified Soil Classification System (USCS) and ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) as a general guideline. After classification, the geotechnical engineer grouped the various soil types into the major zones noted on the test boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses preceding the soil descriptions on the test boring logs. The stratification lines designating the interfaces between earth materials on the test boring logs are approximate; in-situ, the transitions may be gradual.

Calibrated hand penetrometer tests (Q_p) were performed on cohesive soil samples. In the hand penetrometer test, the unconfined compressive strength of a soil sample is estimated, to a maximum of 4.5 tons per square foot (tsf), by measuring the resistance of a soil sample to penetration by a small, calibrated, spring-loaded cylinder.

The results of the laboratory tests are included on the boring logs in Appendix B or on separate test sheets in Appendix C.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded, unless other instructions are received as to their disposal.

5.0 DESIGN RECOMMENDATIONS

This report contains preliminary geotechnical engineering information to evaluate the feasibility of developing the site. The recommendations herein are for preliminary development feasibility purposes only. A more comprehensive subsurface exploration and analysis is recommended to be performed for the development when building elevations, final locations and structural details are known to provide more detailed recommendations for foundations, below-grade walls and floor slabs, including specific allowable soil bearing capacities and estimated settlements for development of the final design of the project.

5.1. PRELIMINARY BUILDING DESIGN

The following sections contain geotechnical design recommendations for foundations, soil supported slabs, below-grade walls, and site retaining walls.

5.1.1. Foundations

Based on the limited subsurface information, shallow spread footing foundation systems are expected to be feasible for the buildings. Preliminary recommendations for conventional spread footing foundation systems are presented below.

Provided subgrades and engineered fills are prepared as discussed herein, the proposed structure may be supported by a conventional individual column (spread) footing and continuous wall (strip) footing foundation system bearing on suitable native soil and/or engineered fill placed continuous from a suitable bearing native soil subgrade. ***Depending on the final site grades undercut of organic soils (encountered at Boring B8), disturbed tillage and soft or very loose soil will likely be necessary.***

The following parameters are recommended for preliminary foundation design.

Table 5.1.1 Preliminary Foundation Design ⁽¹⁾

Design Parameter		Value
Net Allowable Bearing Pressure Range ⁽²⁾		1,500 to 4,000 psf
Minimum Foundation Width	Wall (Strip)	18 inches
	Column (Spread)	30 inches

1. We recommend a structural engineer provide specific foundation details including footing dimensions, reinforcing, and other details.
2. The applied pressure in excess of the surrounding overburden soils above the base of the foundation, based on a factor of safety of 3.

Based primarily on the standard penetration N-values and Qp values, the spread foundations could be designed for a net allowable soil bearing capacity in the range of 1,500 to 4,000 pounds per square foot (psf), depending on location and bearing elevation. The lower value would be suitable for foundations bearing on native soils with an N-value of at least 5 bpf or a Qp of at least 0.75 tsf, while the highest would be suitable for the native soil with an N-value of at least 12 bpf or a Qp of at least 2.0 tsf. In general, the borings indicated more favorable bearing soils in the northwestern area of the site. For preliminary design considerations we recommend utilizing a net allowable bearing pressure of 2,000 psf for foundations placed on native soil having an N-value of at least 6 bpf or a Qp of at least 1.0 tsf. However, using this value, areas having N-values

of less than 6 bpf or Qp values less than 1.0 tsf may require over-excavation and replacement with compacted engineered fill. Total and differential settlements cannot be estimated until actual structural loading conditions become available. However, utilizing assumed building loads of 4 kips per lineal foot on walls and 150 kips on columns, as noted in the **Proposed Construction** section of this report, we estimate total and differential settlements would not exceed 1 inch and ½ inch, respectively.

Because the intent of this exploration only included determining the general suitability of the site for future construction, additional soil borings must be done to provide specific recommendations at the actual building locations. Please contact ECS once project plans are finalized to discuss a project specific supplemental exploration program.

Footing pads are recommended to be directly and entirely supported by suitable bearing inorganic native soil and/or on engineered fill placed continuous from a suitable bearing native soil subgrade. The organic soil should not be used for support.

Observe and test the foundation bearing grade, and backfill foundation undercuts as recommended in the **Foundation and Slab Observations** section of this report.

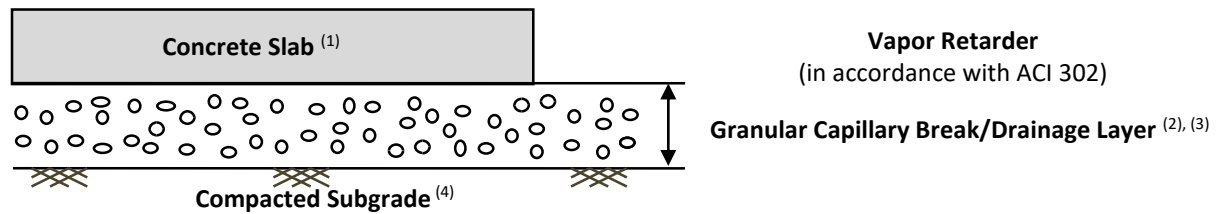
Frost Depth: Footings should be placed at a depth to provide adequate frost cover protection. We recommend the perimeter footings be placed at a minimum depth of 4 feet below finished grade. Interior footings in heated areas can be placed at a minimum of 2 feet below grade provided suitable bearing soils are present and the foundations will not be subjected to freezing weather either during or after construction. Bear footings beyond the building which will not have the benefit of building heat at least 5½ feet below the finished ground grade.

5.1.2. Floor Slabs

The following includes preliminary recommendations for the design and construction of conventional slab-on-grade floors.

Dependent on the location of the building and the top of floor slab elevation, we anticipate the floor slab subgrade could vary from native clay to native sand to engineered fill used to raise site grades. Based on the boring information, undercut is expected to be necessary in areas of the site to develop a suitable floor slab sub-grade, especially if the subgrade is subjected to wet weather and/or construction traffic disturbance.

Based on the anticipated subgrade soils and assumed floor loading, the following graphic depicts our general soil-supported slab recommendations.



1. **Concrete Slab:** Minimum 5 inches thick
2. **Drainage Layer:** Minimum 6 inches thick
3. **Drainage Layer Material:** GRAVEL (GP, GW) having a maximum aggregate size of 1 inch and no more than 5 percent passing the No. 200 sieve.
4. **Compacted Subgrade:** Compacted to at least 95 percent of the maximum dry density per ASTM D1557.

Figure 5.1.1

Depending on the floor elevation relative to the water table, additional drainage provisions or design modifications may be needed. A thicker slab may be needed depending on the actual floor loads. The structural engineer should determine the actual slab thickness and other requirements such as steel reinforcement. Provide adequate construction joints, contraction joints and isolation joints in the slab to reduce the impacts of cracking and shrinkage. Refer to the ACI 302.1R04 *Guide for Concrete Floor and Slab Construction* for additional information regarding concrete slab joint design. Reinforce the slab with welded wire fabric or include an appropriate fiber mesh admixture to help control shrinkage cracking.

We recommend slabs-on-grade be underlain by a granular drainage layer placed on a properly prepared subgrade as recommended in the **Site Construction Recommendations** section. The granular material will serve as a capillary break, which if properly designed and installed can assist in more uniform curing of concrete.

Inclusion of a vapor retarder should be considered if the building will contain moisture-sensitive floor coverings, equipment or materials. The vapor retarder will help reduce the potential of upward migration of water vapor from the soil into and through the concrete slab, which can contribute to excess humidity and microbial growth in the building. Where a vapor retarder is considered to help provide additional moisture protection, special attention should be given to the surface curing of the slabs to reduce uneven drying of the slabs and associated cracking and/or slab curling. The designer should consider the moisture sensitivity of floor coverings and finishes, and the potential effects of slab curling and cracking when determining if the vapor retarder will be in direct contact with the slab or beneath a layer of granular fill. The use of a blotter or cushion layer above the vapor retarder may be considered for project specific reasons. Refer to ACI 302.1R04 *Guide for Concrete Floor and Slab Construction* and ASTM E 1643 *Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs* for additional guidance on these issues.

Positive drainage around the perimeter of the proposed structures should be used to reduce the potential for water accumulation under the floor slab and foundation elements. Slope exterior grades adjacent to the building such that runoff is directed away from the building walls. Direct building downspouts away from the building walls/foundations. Direct slab and pavement surface runoff to appropriate stormwater infrastructure.

Subgrade Modulus: Provided the subgrade is prepared, and any engineered fill and the Granular Drainage Layer are placed as recommended in this report, a modulus of subgrade reaction, k_{v1} of 75 to 150 psi/in (pounds per square inch per inch) could be utilized to design the slabs dependent on the subgrade material. The lower value would generally be suitable for the native clays with a firm consistency, and the higher value would generally be suitable for the native sands with a medium dense relative density. This range of modulus of subgrade reaction value assumed is based on the anticipated subgrade soils, recommended minimum drainage base thickness, and a 1 foot by 1 foot plate load test. However, a specific design k-value cannot be provided until additional project information becomes available.

Slab Isolation: Isolate ground-supported slabs from the foundations and foundation-supported elements of the structure to help reduce shear and bending stresses in the floor caused by differential movement between the foundations and slab. Where the structural configuration prevents the use of a free-floating slab, design the slab with suitable reinforcement and load transfer devices to preclude overstressing of the slab.

Frost Susceptible Areas: Exterior patios and sidewalks, and portions of the floor slab, such as at doorways, and entrance/exit vestibules may be susceptible to frost heave movement during freezing weather. Additional insulation, installation of subgrade drainage, and/or replacement to the frost depth with non-frost-susceptible backfill should be considered for these areas. Slope pavement and ground surface grades away from the building and flatwork, to help reduce water infiltration and potential frost heave problems.

5.1.3. Below-Grade Basement Walls

Some of the buildings may have a basement. The lowest (basement) floor level elevations were not known. The static water table elevation at the time of the exploration is estimated to be at approximately EL. 281 to EL. 287.6 feet, but perched water conditions may develop or exist at shallower depths. The encountered water levels should be considered when setting the floor elevations. It is recommended the basement floor be kept at least 2 feet above the water table, or the basement should be designed to be water tight and hydrostatic pressure resistant to reduce water related problems.

Drainage System Recommendations: A drainage system is recommended to remove water near the below-grade walls and beneath the lowest level floor slab to lessen the potential for water pressure build-up against the below-grade walls.

Drainage aggregate should be in contact with the below-grade walls as part of the drainage system. The aggregate will serve as drainage media to help lessen lateral pressures against the below-grade walls, as compared to the on-site silty and clayey soils. The drainage aggregate layer should be at least 2 feet wide, measured horizontally from the below-grade walls. The drainage aggregate layer should begin at the base of the footing pads and continue to approximately 1-foot

of the ground surface, where a clay cap or other relatively impermeable surface material should be installed to reduce surface water intrusion. The free-draining aggregate is recommended to consist of a well-graded aggregate such as WisDOT Standard Specifications Section 305 material. An open-graded aggregate, such as WisDOT Standard Specifications Section 310 material, could be used, but if used, a geotextile is recommended to be placed between the drainage aggregate and soil of the excavation to provide separation and reduce migration of fine material into the void space of the open-graded aggregate. The geotextile is recommended to be in accordance with Wisconsin Department of Transportation Standard Specifications Section 645, Type DF, Schedule A.

Continuous drain pipes should be installed along the interior and exterior sides of the perimeter strip footing pads; creating interior and exterior drainage loops. Depending on the proximity of the estimated water table to the planned floor elevation, interior below-floor laterals connected to the subdrainage system may be needed so that water does not have to travel far to reach a drain pipe. The drain pipes should be minimum 4-inch-diameter perforated pipes specifically designed for drainage applications. The interior and exterior drain pipe systems should connect to the storm sewer system for removal, or common sump crocks equipped with sump pumps that discharge water to the ground surface, away from the below-grade walls. Submersible sump pumps and sealed sump crock lids are recommended to lessen the in-flow of subsurface gases, such as radon. Multiple sump pits are recommended. The project architect should determine the sump pump locations based upon architectural and structural details of the building. Equip the sump pumps with generator or battery back-up systems to reduce the potential for water problems in the event of a power failure. Cast drain pipe bleeders in the perimeter strip footing pads to serve as water conduits between interior and exterior drainpipes. If there is an obstruction in one of the interior or exterior drain pipes, the bleeder pipes help allow the water to bypass the obstructed area. The bleeder pipes should be approximately 3 inches in diameter and approximately 6 to 8 feet-on-center.

Drainage Aggregate Compaction: Backfill that is placed adjacent to below-ground walls, and will also provide structural support, should be compacted to between 88 and 90 percent of the maximum dry density obtained by the Modified Proctor compaction test (ASTM D1557) or to an in-place density specified by the project architect or structural engineer. The drainage aggregate should be compacted in maximum 8-inch-thick lifts (measured loose). Do not use heavy compaction equipment, such as mechanical rollers, within approximately 10 feet of the below-grade walls because high lateral pressures could develop and the walls could move and possibly fail. Use hand-operated compaction equipment, such as vibratory plates, within approximately 10 feet of below-grade walls. Brace below-grade walls during construction, backfilling, and compaction. The bracing should remain in-place until the below-ground floor slabs and main floor deck are installed.

It is common, but not recommended, for below-grade wall backfilled to be compacted with minimal effort. As a result, settlement of the ground surface around the perimeter of structures commonly occurs. To reduce the potential for excessive settlement and related damage to patios, sidewalks, stoop and porches, we recommend ECS observe and test backfill activities full-time during construction. If stoop or porch footings are not founded on compacted backfill material, stoop and porch footings could be extended to the same depth as the building footings or tied (cantilevered) into cast-in-place below-grade walls.

Exterior Ground Surface Positive Drainage: The ground surface is recommended to be graded to direct water away from the backfill of the below-grade walls. Connect roof drains to the storm water drainage system where allowed. Where utility excavations intersect the basement wall drainage backfill, a clay backfill “dam” may need to be constructed to reduce the potential for water that accumulates within the utility backfill to backflow into the below-ground wall drainage system backfill.

Lateral Pressures: Design the below-grade walls to resist lateral pressures from the adjacent soil, water, and any surface or other surcharges. Design the walls as restrained retaining walls based on at-rest earth pressures. Assuming that drainage aggregate will be properly drained, preliminarily, an equivalent at-rest fluid pressure of 66 psf per foot of depth may be used for below-grade wall design. Where not fully drained, an equivalent at-rest fluid pressure of 128 psf per foot of depth is preliminarily recommended to be used for below-grade wall design. Lower equivalent fluid pressures are possible where the retained soil is sand and/or if a sloped excavation bank extending outside the active pressure zone and granular backfill are used. Where not fully drained, the walls both inside and out may be subject to moisture and/or water problems. Any surcharge loads imposed within a 45 degree slope of the base of the wall should be considered in the below grade wall design. The influence of these surcharge loads on the below grade walls should be based on an at-rest pressure coefficient, k_o , of 0.53 in the case of restrained walls. We can provide supplemental recommendations regarding surcharge loads on a case-by-case basis. Below-grade walls that are not designed to resist these pressures will be prone to lateral movement and potential distress. A soil-footing coefficient of sliding friction of 0.37 is recommended for sliding resistance for footings bearing on sand. A cohesion value of 500 psf may be used for lateral sliding resistance on the clay soil, but in no case should the lateral sliding resistance exceed half the dead load.

Hydrostatic Uplift: If the basement floor cannot be kept at least 2 feet above the water table, design the basement to resist hydrostatic uplift pressures. The following recommendations are for a water-tight, hydrostatic pressure resistant slab and water-tight hydraulic pressure resistant wall design.

Below grade structures are recommended to be water-tight. Water-tight construction should include water-stops at all junctures between the slab and the below-grade walls and at all other construction and control joints. Suitable waterproofing material should be placed along the exterior below-grade walls.

Design those portions of the structure that will be beneath the water table to resist hydrostatic uplift and hydraulic lateral pressures. It is not considered practical to attempt to depress the groundwater table. The slab must be designed to resist the hydrostatic head, which corresponds to a maximum uplift and lateral pressure of the depth of the slab below the groundwater level multiplied by the unit weight of water. Structure dead weight may be used to determine uplift resistance. Live loads are not recommended to be used to determine uplift resistance.

5.1.4. Site Retaining Walls

Site retaining walls are often constructed “bottom-up” and therefore the type of soil used to backfill the wall is chosen or specified by contract. The lateral earth pressures developed behind site retaining walls is a function of the backfill soil type within an approximate 45-degree angle from the base of the wall upward.

Lateral Earth Pressures: Design the walls to withstand the lateral earth pressures exerted by the backfill water, and any surface or other surcharges. The pressure diagram is triangular. It is anticipated that retaining walls associated with the building structure, such as for a unloading/loading dock situation, will be rigid walls restrained from rotation by the floor slab. For rigid walls, use the “at-rest” (k_o) soil condition in the wall design and evaluation. For walls that are free to deflect at their tops, use the “Active” (k_a) soil condition in the wall design and evaluation. The parameters in Tables 5.1.4.1 and 5.1.4.2 are recommended for retaining wall design. These parameters are based on the assumption free-draining granular aggregate meeting the recommendations herein for retaining wall backfill will be placed throughout the “critical zone” and the backfill will be properly drained. The critical zone is defined as the area between the back of the retaining wall structure and an imaginary line projected upward and rearward from the bottom back edge of the wall footing at a 45-degree angle. The parameters provided are based on the assumption the grade behind the wall and the grade in front of the wall is level. If the grade behind or in front of the wall will be sloped, contact us for revised parameters.

Table 5.1.4.1 Retaining Wall Backfill in the Critical Zone

Zone	Soil Parameter	Estimated value
Retained Soil	Unit Weight (γ)	125 pcf
	Angle of Internal Friction (ϕ)	28°
	Cohesion (C)	0 psf
	Coefficient of Earth Pressure at Rest (K_o)	0.53
	At-rest Equivalent Fluid Pressure	66H (psf)
	Coefficient of Active Earth Pressure (K_a)	0.36
	Active Equivalent Fluid Pressure	45H (psf)
Backfill	Unit Weight (γ)	120 pcf
	Angle of Internal Friction (ϕ)	32°
	Cohesion (C)	0 psf
	Coefficient of Earth Pressure at Rest (K_o)	0.47
	At-rest Equivalent Fluid Pressure	57H (psf)
	Coefficient of Active Earth Pressure (K_a)	0.31
	Active Equivalent Fluid Pressure	37H (psf)

Retaining Wall Backfill: The backfill within the critical zone behind retaining walls is recommended to consist of crushed stone aggregate with a maximum of 15 percent fines (i.e., percentage of material passing a No. 200 Sieve), and minimum angle of internal friction of 32 degrees when compacted to a minimum of 95 percent of its maximum dry density per ASTM D1557. Remove any material within the Critical Zone not meeting these criteria.

Wall Drains: All site retaining walls should be drained so that hydrostatic pressures do not build up behind the walls. Wall drains may consist of a 12-inch wide zone of free draining gravel, such as ASTM No. 57 Stone, placed directly behind the wall and separated from the soils beyond with a non-woven filter geotextile. Alternatively, the wall drain may consist of a suitable geocomposite drainage board material. The wall drain should be hydraulically connected to the foundation drain discussed below.

Table 5.1.4.2 Foundation Soils (Native Subgrades or Engineered Fill)

Soil Parameter	Estimated value
Allowable Net Soil Bearing Pressure	Refer to Foundations section
Minimum Wall Embedment Below Grade	4 feet
Coefficient of Passive Earth Pressure (K_p)	2.0
Soil Moist Unit Weight (γ)	125 pcf
Cohesion (C)	0 psf
Interface Friction Angle [Poured Concrete on Soil] (ϕ_i)	18°
Sliding Friction Coefficient [Poured Concrete on Soil] (μ)	0.37
Passive Equivalent Fluid Pressure ⁽¹⁾	260H (psf)

1. Neglect the passive earth pressure on the low side of the wall within the frost zone due to loss of strength seasonally and strain required to mobilize.

Foundation Drains: Include a foundation drainage system to help relieve hydrostatic pressures which may develop in the wall backfill. This system should consist of weep holes through the wall and/or a 4-inch perforated, closed joint drain line located along the backside of the walls above the top of the footing. Surround the drain lines with a minimum of 8 inches of drainage aggregate, such as ASTM Size No. 57 Stone, wrapped with an appropriate non-woven geotextile that meets the requirements of WisDOT Standard Specifications Section 645, Type DF.

5.2. PAVEMENT DESIGN CONSIDERATIONS

The following sections provide recommendations for pavements.

Subgrade Characteristics: A California Bearing Ratio (CBR) test is commonly used to determine soil support parameters for pavement design. A CBR test or other appropriate test was not part of the scope for this project, so it was necessary to assume the CBR design value. Based on the test borings, it appears the pavement subgrade soils will mainly consist of lean clay. The clay soil at the test borings was found to have a very soft to very stiff consistency. Because this material is frost susceptible and does not drain well, it is generally considered a poor subgrade material. We assumed a design CBR value of 3 for the flexible pavement and assuming a modulus of subgrade reaction, k_{v1} of 75 psi/in for the rigid pavement. The pavement design recommendations assume the subgrade consists of suitable materials evaluated by ECS, and the subgrade is prepared as recommended in the **Subgrade Preparation** and **Earthwork Operations** sections of this report.

A reduced service life, increased pavement maintenance and associated costs should be expected where the frost susceptible silty and clayey soil is present. The reduced pavement performance may occur because of potential detrimental frost heaving and spring thaw weakening. The risk associated with frost susceptible soils could be reduced by removal of all frost susceptible soils within 3 feet of the finished pavement grade and replacement with low frost susceptible engineered fill.

A geotextile may be desirable in portions of the site since it will provide separation between the aggregate base course and the subgrade soils, which will help maintain the design thickness and support characteristics of the base course. A slightly thicker (2 to 3 inches) aggregate base course layer could also be used to help account for intrusion of the base course by the subgrade soils.

Install geotextiles, where needed, in accordance with manufacturer's recommendations. Geotextile sheets are recommended to be placed taut to reduce wrinkles or folds. Intersections of geotextile sheets must be sewn or adequately overlapped (minimum 18 inches). Exercise care to prevent physical damage of the geotextile prior to, during, and after construction. The minimum physical criteria for the geotextile are recommended to satisfy Wisconsin DOT Section 645, type SAS geotextile fabric specifications. The geotextile should be considered only as a separator between the aggregate base course and the cohesive subgrade soils, rather than providing an increase in the support characteristics of the subgrade. Support increase possibly occurs, but should only be considered an increase in the design safety factor. A geogrid, removal and replacement with select material, or chemical modification of the subgrade soils is recommended to be used, if it is desired to increase the support characteristics of the subgrade.

Pavement Sections: The recommended minimum pavement sections listed in Table 5.2.1 are based on the anticipated usage at the project site and a 20-year design service life, but were not developed based on specific traffic patterns, loading and resiliency factors, as those parameters were not provided by the design team.

The assumption for the light-duty pavement section is that typical traffic loads will be limited to standard automobiles and does not account for more heavily loaded vehicles (i.e., multiple axle trucks) and should be used for parking lanes. In frequent traffic areas such as where trucks frequently turn, drive through lanes, delivery areas, loading dock aprons, trash enclosure pads, and points of ingress or egress the heavy duty rigid pavement is recommended to be used. ***If the anticipated traffic will exceed that assumed in the Proposed Construction section, ECS should be contacted for revised pavement design recommendations; otherwise, increased pavement maintenance and a shortened pavement life should be expected.***

Table 5.2.1 Pavement Section Recommendations

Pavement Material	Compacted Material Thicknesses (Inches)		
	Flexible Pavement		Rigid Pavement (Heavy Duty)
	Light Duty	Heavy Duty	
Portland Cement Concrete ⁽¹⁾	--	--	6
Hot Mix Asphalt ⁽²⁾ Surface Course	1½	1½	--
Hot Mix Asphalt ⁽²⁾ Binder Course	2	3	--
Dense Graded Crushed Stone Base ⁽³⁾	9	10	6
Total Pavement Section Thickness	12½	14½	12

1. Section 415 of WisDOT Standard Specification for Highway and Structure Construction.
2. Section 460 of WisDOT Standard Specification for Highway and Structure Construction.
3. Section 305 of WisDOT Standard Specification for Highway and Structure Construction. Use 1¼-inch dense graded crushed stone base. If crushed gravel or some other material is used in lieu of crushed stone, the material may have a lower structural coefficient and a thicker base may be required.

All pavement materials and construction should be in accordance with the AASHTO Guide for Design of Pavement Structures, and the WisDOT Standard Specifications for Highway and Structure Construction.

If the pavements will be constructed early during site development to accommodate construction traffic, consideration should be given to the construction of designated haul roads, where thickened pavement sections are provided to accommodate the construction traffic, as well as the future in-service traffic. ECS can provide additional design assistance with recommended pavement sections for haul roads if requested.

We recommend the crushed granular base course be compacted to at least 95 percent of the maximum dry density obtained in accordance with ASTM D1557, Modified Proctor Method, within ±3 percent of the optimum moisture content value. The hot mix asphalt should be compacted to a minimum of 93 percent of the maximum theoretical density value.

Rigid Pavements: We recommend an air-entrained concrete mix (compressive strength of at least 4,000 pounds per square inch at 28 days) for rigid pavement. Provide adequate construction joints, contraction joints and isolation joints in the areas of rigid pavement to reduce the impacts of cracking and shrinkage. Please refer to ACI 330R-92 *Guide for Design of Concrete Parking Lots*. The Guide recommends an appropriate spacing strategy for the anticipated loads and pavement thickness. It has been our experience that joint spacing closer to the recommended values in ACI results in a pavement with less cracks outside the joints and better long-term performance. Control joint spacing should be determined in accordance with the current ACI code. Provide expansion joints where the pavement abuts fixed objects, such as the buildings and light poles.

Weather Restrictions: Daily temperatures from mid-November to April can often stay below 40°F, limiting the days that asphalt placement can occur. In this region, asphalt plants may close during the months of December, January, and/or February if particularly cold weather conditions prevail. However, this can change based on year to year temperature fluctuations.

Pavement Drainage: An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Based on our estimated groundwater level, we consider surface water infiltration to be the main source of water to be considered for pavement design on this project.

Shape or crown the final pavement surface to properly direct surface water to suitable on or off-site stormwater drainage infrastructure. Properly slope the clay pavement subgrade to avoid dips or pockets where water may become trapped. Dips in the clay subgrade could result in a “bathtub” effect, which may trap water and potentially soften the subgrade. The subgrade in areas requiring undercut and backfill with granular soils are recommended to be graded to drain toward a drain tile. The drain tile should be sloped a minimum of ½ to 1 percent to discharge to nearby storm sewers, drainage ditches or other appropriate drainage facilities. Install edge drains where site grades slope toward the pavement edge to reduce the potential for water to enter the base course layer. Slope edge drains to the nearest appropriate drainage facility. Water that ponds on the subgrade surface can lead to deterioration of the subgrade soils, reduction of the base course support characteristics and pavement heave. Good drainage should help reduce the possibility of the subgrade materials being wet over a long period of time.

To reduce the potential for shallow perched water to develop in areas of the site, install “stub” or “finger” drains around catch basins and in other low-lying areas of the parking lot to reduce the accumulation of water above and within the subgrade soils and aggregate base. As an alternative to the use of stub or finger drains, perforate existing manholes and storm sewer inlets with 1-inch diameter holes at 2-foot centers, and wrap the manhole/inlet with a non-woven geotextile to reduce migration of material into the manhole/inlet. The holes could be placed at 90 degree intervals around the perimeter of the manhole, and the excavation around the manhole backfilled with free draining granular materials. Consider installation of pavement edge drains or trench drains to reduce the accumulation of water within the base course and on the subgrade soils.

Pavement Maintenance: A sound maintenance program should be implemented to help maintain and enhance the performance of pavements, and help attain the design service life. A preventative maintenance program should be started early in the pavement life to be effective. The “standard in the industry” supported by research indicates that preventative maintenance should typically begin within 2 to 5 years of the placement of pavement. However, maintenance of pavement on undocumented fill sites may require more maintenance and sooner. Failure to perform preventative maintenance will reduce the service life of the pavement, and increase the costs for corrective maintenance and full pavement rehabilitation. Seal joints and cracks with elastomeric caulk in a timely manner to help reduce water infiltration thru the pavement section into the base course layer, which may result in softening of the subgrade and deterioration of the pavement. Observe pavements for distresses, such as cracks, depressions and poor drainage, at least twice a year, typically once in the spring and once in the fall.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1. SUBGRADE PREPARATION

The method of site preparation will depend on some factors that were unknown at the time this report was prepared, which may include weather before and during construction, the possibility of subsurface conditions not revealed by the borings, and the final details of the proposed development.

6.1.1. Stripping and Grubbing

The subgrade preparation should include stripping all pavement, vegetation, rootmat, topsoil, and any other soft or otherwise unsuitable materials from the 10-foot expanded building limits, 5-foot expanded pavement limits, and 5 feet beyond the toe of engineered fills, where feasible. Topsoil deposits (approximately 5 to 18 inches thick) were observed at the boring locations. The project team should be prepared to remove the topsoil in its entirety within the limits noted above. Because topsoil depths can vary greatly across a site the contractor should verify topsoil depths as part of their bidding process. Call on ECS to observe and document that topsoil and other unsuitable surficial materials have been removed prior to the placement of engineered fill or construction of structures. Note topsoil removal should not be based on soil coloration alone. After removal of the rootmat, it may be possible to leave some darker soils in place provided the soil contains no more than 3 percent organic matter as determined by ASTM D2974, has the recommended strength characteristics and is stable under proofroll. A landscape architect should approve any topsoil or other materials proposed for use in future landscape areas.

ECS recommends the subgrade not be exposed to the elements or construction traffic for a prolonged period of time as the subgrade may become disturbed and/or softened. If the slab and pavement sections are not planned to be constructed within a few days after exposing the final design subgrade, consideration should be given to leaving the subgrade approximately 1 foot above the final design subgrade, where feasible, to help reduce softening of the design subgrade soil. Proofroll the exposed subgrade as recommended below.

6.1.2. Proofrolling

Thoroughly proofroll the exposed subgrade after removal of all unsuitable surface materials, the site has been cut to the proposed grade, and prior to the placement of any engineered fill or other construction materials. Proofroll with construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck) under the observation of ECS. Traverse the subgrade with the proofroll equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle. This procedure is intended to assist identification of yielding subgrade materials. Marked unstable or pumping subgrade areas identified during the proofroll for repair prior to the placement of any subsequent engineered fill or other construction materials. Unstable subgrade repair methods, such as undercutting, or moisture conditioning and recompaction, or chemical stabilization, should be discussed with ECS to determine the appropriate procedures with regard to the existing conditions causing the instability. Test pits may be excavated to explore the shallow subsurface materials in the area of the instability to help determine the appropriate remedial action to stabilize the subgrade.

Some slab areas, such as at basements, may be inaccessible to appropriate proofroll equipment. Evaluate areas inaccessible to proofroll with hand-operated testing equipment to check the subgrade support characteristics.

Seasonal reduction of the near surface soil strength can occur during wet times of the year (such as during the spring and fall months) or immediately following extended periods of rain. This may result in additional unstable or pumping subgrade areas. The clay materials and organic soils, present near surface at several of the boring locations, may not pass a proofroll, and may need to be undercut or repaired. Some undercutting or repair of unstable subgrade soils should be anticipated during slab and pavement subgrade preparation. The actual quantity of the subgrade undercut or stabilization should be determined at the time of construction.

Undercut or repair unstable subgrades to establish a suitable support condition. Improvement The method chosen may be influenced by several factors such as weather and schedule, as well as the area, depth and nature of the unstable subgrade soils. Depending on the aforementioned and other factors, subgrade repair methods may include:

Scarification and Compaction: Soils can be scarified, moisture conditioned (i.e., dried or wetted) to within a narrow range of the materials optimum moisture content, and compacted.

Undercut and Replacement: We recommend soft or yielding soils be evaluated in approximately 6 to 12-inch intervals to help limit the required volume of undercuts. If soft or yielding soils are identified, the contractor should remove only 6 to 12 inches of material at a time in the subject area and then proofroll/evaluate the undercut subgrade to determine if additional undercut is needed. This may take more time, but could potentially reduce the removal of more soil than necessary. Use of a geogrid could also be considered to reduce undercut depths. A geogrid, if used, should be placed after underground work, such as utility construction, is complete. Do not operate equipment on the geogrid until after 1 foot of engineered fill is placed above it. Depending on the conditions at the time of repair, use of an aggregate engineered fill, such as crushed stone, crushed concrete or gravel, may be needed.

Chemical Modification: Alternatively, if these soils cannot be stabilized by conventional methods, chemical modification of the subgrade soils, such as with hydrated lime, lime kiln dust, cement, cement kiln dust, or other materials, may be utilized to reduce the moisture content and/or provide additional stabilization. An experienced pre-qualified contractor that has successfully chemically modified similar-sized projects with similar soil conditions is recommended to be used. The soil modification procedure, such as determination of the type and quantity of additive, and mixing and curing procedures, should be evaluated before implementation. This evaluation may include testing the soil for pH, resistivity, sulphates, and chloride to check if an adverse chemical reaction could occur. The contractor should be required to minimize dusting or implement dust control measures, as required. For preliminary estimating purposes, the approximate incorporation rate (based on dry weight of soil) is 4 to 7 percent for hydrated lime or lime by-products, and 4 to 10 percent for Portland cement.

6.1.3. Subgrade

Subgrade Compaction: Upon completion of subgrade documentation and within the 10-foot expanded building area, 5-foot expanded pavement area and embankment limits moisture condition the exposed subgrade to within -1 to +3 percent of the soil's optimum moisture content to a depth of 10 inches. Compact the moisture conditioned subgrade with suitable equipment (minimum 10-ton vibratory roller for granular soil or a sheepsfoot roller for cohesive soil). Vibratory compaction methods near the water table, however, are not recommended because an unstable condition could develop. Subgrade compaction within the expanded building, pavement and embankment limits should be to a dry density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). Beyond these areas, compaction should be to at least 90 percent. Call on ECS to check and document that proper subgrade compaction has been achieved.

Subgrade Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits for buildings, pavements, fills, slopes, etc. The recommended minimum frequency for field density testing of the subgrade is listed in Table 6.1.1.

Table 6.1.1 Frequency of Subgrade Compaction Testing

Location	Frequency of Tests
Expanded Building Limits	1 test per 2,500 sq. ft.
Pavement Areas	1 test per 10,000 sq. ft.
Other Non-Critical Areas	1 test per 10,000 sq. ft.

6.1.4. Site Temporary Dewatering

It appears the hydrostatic groundwater level at this site may be approximately 3 to 10 feet below grade (approximately EL. 281 to EL. 287.5 feet). Where excavations will extend below the groundwater level encountered at the boring locations, excavation dewatering will be necessary. Seasonal variations in precipitation and site drainage conditions can cause the accumulation of water in the upper soils, particularly within existing fill and more permeable granular soils underlain by less permeable clayey soils. Where excavations extend less than 2 feet below the groundwater level, especially in areas containing primarily clayey soils, initial attempts to control water may be accomplished by pumping from sump pits in the excavation bottom, which is backfilled with drainage aggregate such as AASHTO Size No. 57 Stone or open-graded bedding material. If water control cannot be maintained with sump pumps, or where excavations extend more than 2 feet below the groundwater level, dewatering likely will require installation of a more specialized dewatering system to help maintain the groundwater level below the excavation bottom. A qualified dewatering contractor should be consulted if groundwater cannot be satisfactorily controlled through the use of sump pumps.

6.2. EARTHWORK OPERATIONS

6.2.1. Engineered Fill Materials

Product Submittals: Prior to placement of engineered fill, representative bulk samples (typically at least 50 pounds) of on-site and off-site borrow should be submitted to ECS for laboratory testing, which may include natural moisture content, organic content, grain-size distribution, Atterberg limits, and moisture-density relationships for compaction. Import material should be tested prior to being hauled to the site to determine if it complies with project specifications.

Satisfactory Engineered Fill Materials: Engineered fills should consist of approved materials, contain no more than 3 percent organic matter as determined by ASTM D2974, be free of debris, and contain no particle sizes greater than 3 inches in the largest dimension. Open-graded materials, such as coarser sands, and gravels (SP and GP), which contain void space in their mass should not be used in engineered fills unless properly encapsulated within a filter geotextile. If the fill is to provide low-frost susceptible characteristics, it must be classified as a clean GW, GP, SW or SP per Unified Soil Classification System (ASTM D-2487) and must be properly drained. The material used as engineered fill must be considered low volume change material and should have the index properties listed in Table 6.2.1, unless specifically tested and found to have low volume change properties by ECS.

Table 6.2.1 Engineered fill Index Properties

Location with Respect to Final Grade		LL	PI
Building Areas	Upper 4 feet	40 max	12 max
	Below upper 4 feet	50 max	20 max
Pavement Areas	Upper 2 feet	40 max	12 max
	Below upper 2 feet	50 max	20 max

Satisfactory Retaining Wall Backfill: Materials used as backfill within the Critical Zone behind retaining walls should have USCS classifications of sand or gravel with a maximum of 15 percent fines, and minimum angle of internal friction of 32 degrees when compacted to a minimum of 95 percent of its maximum dry density per ASTM D 1557. Any material not meeting these criteria should be removed from the Critical Zone behind the walls, as recommended by ECS at the time of construction.

Unsatisfactory Materials: Unsatisfactory engineered fill materials, which do not satisfy the requirements for suitable materials, include topsoil and organic materials (PT, OH, OL), frost susceptible silt (ML), and high plasticity soils elastic silt (MH) and fat clay (CH).

Pea gravel is not recommended to be used as engineered fill. Pea gravel has round/smooth characteristics, no fines and does not interlock when compacted, which makes it more susceptible to future movement and instability resulting in excessive and variable settlement.

On-Site Borrow Suitability: The on-site soil, with the exception of topsoil and swamp deposits, may be feasible to reuse as engineered fill, but should be further evaluated by ECS prior to its use. On-site soil used as engineered fill must not contain more than 3 percent organic matter as

determined by ASTM D2974, and must be free of frozen matter, deleterious materials, over-sized material (maximum 3-inch particle diameter), or chemicals that may result in the material being classified as “contaminated.” Some conditions at the time of construction, such as wet or freezing weather, may preclude the use of on-site soil, and use of an imported less moisture sensitive or less frost susceptible granular material may be needed. Some of the soil had a high relative moisture so some drying of on-site soil prior to reuse as engineered fill is expected to be needed. The engineered fill materials is recommended to be checked by ECS prior to placement.

6.2.2. Compaction

Subgrade Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits for buildings, pavements, fills, slopes, etc. The recommended minimum frequency for field density testing of the subgrade is listed in Table 6.1.1.

Subgrade Benching: Place fill material in horizontal lifts. Place and compact fill on a 5 (H):1 (V) or flatter slope, or step or bench as required to flatten.

Engineered fill Compaction: Place and compact engineered fill in maximum 8-inch thick loose lifts within the expanded building, pavement, and embankment limits. Moisture condition fine grained soils as necessary to between -1 and +3 percent of the soil’s optimum moisture content, and moisture condition coarse grained soils as necessary to within ± 3 percent of the soil’s optimum moisture content. The soil should not be compacted too dry as it may lose its apparent stability if it later becomes wet. Soil chemical modification may be helpful to reduce moisture contents of subgrade soils and fills. Compact all materials within the expanded building, pavement, and embankment limits with suitable equipment to a dry density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). Beyond these areas, achieve compaction of at least 90 percent. Give as much importance to the moisture content requirements of the material as the density requirements during placement and compaction considering the moisture sensitivity of the soil. Call on ECS to check and document that proper fill compaction has been achieved.

Fill Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits of the fill zones for buildings, pavements, and slopes, etc., at the time of fill placement. Maintain grade control throughout the filling operations. All filling operations are recommended to be observed on a full-time basis by ECS to check and document that the minimum compaction requirements are being achieved. The recommended minimum frequency for field density testing of fills is listed in Table 6.2.2, but should not be less than 1 test per lift.

Table 6.2.2 Frequency of Compaction Tests in Fill Areas

Location	Frequency of Tests
Expanded Building Limits	1 test per 2,500 sq. ft. per lift
Pavement Areas	1 test per 10,000 sq. ft. per lift
Utility Trenches	1 test per 200 linear ft. per lift
Outparcels/SWM Facilities	1 test per 5,000 sq. ft. per lift
All Other Non-Critical Areas	1 test per 10,000 sq. ft. per lift

Compaction Equipment: Compaction equipment suitable to the soil type being compacted should be used to compact the subgrades and fill materials. Sheepsfoot compaction equipment should be suitable for the fine-grained soils (clays and silts). A vibratory steel drum roller should be used for compaction of coarse-grained soils (sands and gravels) as well as to help seal compacted surfaces. However, vibratory methods are not recommended near the water table because an unstable condition could develop. Static compaction and thinner lifts are expected to be needed near the water table.

Engineered Fill below Foundations: The zone of the engineered fill placed below the foundations is recommended to extend 1 foot beyond the outside edges of the footings and from that point, outward laterally 1 foot for every 2 feet of fill thickness below the footing.

Engineered Fill in Confined Areas: In confined areas such as utility trenches, portable compaction equipment and thin lifts of 4 inches or less may be required to achieve specified degrees of compaction.

Fill Placement Considerations: Do not place fill materials on frozen soils, on frost-heaved soils, on excessively wet soils, or soils that are otherwise unstable. Borrow fill materials should not contain frozen materials at the time of placement, and all frozen or frost-heaved soils should be removed prior to placement of engineered fill or other fill soils and aggregates. Excessively wet soils or aggregates should be scarified, aerated, and moisture conditioned.

Grade fill areas at the end of each work day to facilitate drainage of any precipitation and seal the surface by use of a smooth-drum roller to reduce infiltration of surface water. During placement and compaction of new fill at the beginning of each workday, the Contractor may need to scarify existing subgrades to an approximate depth of 4 inches to reduce the potential for a weak plane to form between the new fill and the existing subgrade soils.

Drying and compaction of wet soils is difficult, especially during the wetter and/or colder months of late fall to early spring. Perform earthwork during the warmer drier times of the year, if practical, to reduce the potential for compaction difficulties. Maintain proper drainage during earthwork to reduce ponding of water which can degrade subgrade soils. Alternatively, if the soils cannot be stabilized by conventional methods, chemical modification of the soils, as previously discussed, may be utilized to adjust the moisture content.

Have equipment readily available during earthwork for both drying and wetting of fill soils. We do not anticipate significant problems in controlling moisture within the fill during dry weather, but moisture control may be difficult during winter months or extended periods of rain. The control of moisture content of clayey and silty soils can be difficult. Further, these soils are easily degraded by construction traffic when the moisture content is elevated.

6.3. FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Foundation concrete should be placed the same day that excavations are made. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must

remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 2 to 3-inch thick “mud mat” of “lean” concrete should be placed on the bearing soils before the placement of reinforcing steel.

Footing Subgrade Observations: The recommendations of this report are predicated upon ECS checking the suitability of the actual foundation support soils during construction. We recommend hand auger probes and appropriate bearing capacity tests be conducted during construction. Cone penetrometer tests (static or dynamic, depending on soil type) or other appropriate bearing capacity tests should be conducted within the probe holes to evaluate the support characteristics of the soil. The suitability of the actual bearing grade is recommended to be observed and tested to check that the soils are as indicated by the borings and are suitable to support the recommended maximum net allowable bearing pressure. The soil is recommended to be tested to a depth equivalent to $\frac{1}{2}$ the footing width (i.e., $\frac{1}{2}B$) or a minimum of 3 feet, whichever is deeper, below the foundation bearing grade or undercut subgrade. This observation and testing should be performed at each isolated column footing and at approximately 20-foot intervals along continuous wall footings.

Recompact unsuitable bearing soils encountered at the proposed foundation bearing grade or within the foundation influence zone, if feasible, or removed to a suitable bearing subgrade and to a lateral extent, as noted in the **Earthwork Operations** section. Backfill any undercuts with engineered fill or lean concrete ($f'_c \geq 1,000$ psi at 28 days) up to the original design bottom of footing elevation. The original footing is recommended to be constructed on top of the engineered fill or hardened lean concrete. Place and compact engineered fill as recommended in the **Earthwork Operations** section of this report. If lean concrete is utilized to replace weaker/low bearing soils or unsuitable soils, lateral over-excavation is typically not necessary, but the excavation is recommended to be 1 foot wider than the footing (6 inches on each side), and the lean concrete should be allowed to sufficiently harden prior to placement of the foundation concrete. Use of lean mix concrete to limit lateral over-excavation may not be effective due to caving of excavation sidewalls in the granular soil.

Slab Subgrade Verification: Call on ECS to observe and test exposed subgrade within the expanded building limits prior to engineered fill placement and slab construction to check that adequate subgrade preparation has been achieved. Perform a proofroll using a loaded dump truck in ECS' presence at that time. Once subgrades have been prepared to the satisfaction of ECS, subgrades should be properly compacted and new engineered fill can be placed. Existing subgrades to a depth of at least 10 inches and all engineered fill should be properly moisture conditioned and compacted to the required in-place density. ECS should check the condition of the prepared subgrade prior to placement of the subbase stone and concrete. If there will be significant time lag between the subgrade check and placement of the subbase stone and concrete, ECS may need to recheck the condition of the subgrade before placement of stone and concrete. Prior to final slab construction, the subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

6.4. UTILITY INSTALLATIONS

Perform utility construction in accordance with *The Standard Specifications for Sewer and Water Line Construction in Wisconsin*.

Utility Subgrades: The soils encountered at the test boring locations are expected to be generally suitable for support of utility pipes. The pipe subgrade should be observed and tested by ECS to check the suitability of the materials encountered at the time of construction. Remove any organic soils, soft, loose or otherwise unsuitable materials encountered at the utility pipe subgrade elevation and replace with suitable compacted engineered fill or pipe bedding material. ***Depending on the invert elevations some undercut and/or dewatering may be needed.***

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the project drawings and specifications. Granular bedding is recommended to consist of crushed stone chips in accordance with Table 32 and Chapter 8.43.0 of the *Standard Specifications for Sewer and Water Construction in Wisconsin*. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the recommendations for engineered fill given in this report. Cover material is recommended to consist of material in accordance with Table 36 and Chapter 8.43.3 of the *Standard Specifications for Sewer and Water Construction in Wisconsin*. Granular backfill material is recommended to consist of material in accordance with Table 37 and Chapter 8.43.4 of the *Standard Specifications for Sewer and Water Construction in Wisconsin*. Excavated material in accordance with Chapter 8.43.5 of the *Standard Specifications for Sewer and Water Construction in Wisconsin*, and as recommended in the **Earthwork Operations** section of this report could also be used as backfill.

We do not recommend flood compaction of the backfill, especially within a cohesive soil excavation, where cohesive soils are used as backfill, and/or where a shallow water table exists. Mechanical compaction is recommended and preferred since it generally provides more uniform compaction than flood compaction.

6.5. GENERAL CONSTRUCTION CONSIDERATIONS

Subgrade Protection: Take measures to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including structural and pavement areas. Measures could include designating a haul road and construction staging area to limit the areas of disturbance, subgrade soil degradation and existing pavement distress. Consider covering haul roads and construction staging areas with excess depths of coarse aggregate to help protect those subgrades. The aggregate can later be removed and used in pavement areas.

Surface Drainage: Properly maintain surface drainage conditions. Grade the site area at a gradient of 1 percent or steeper to direct water away from construction areas, and reduce the potential of water ponding on the site surface and the subsequent saturation of the surface and subsurface soils. Roll the subgrade with a smooth drum roller at the end of each work day to help seal the surface soil and reduce infiltration of surface water.

Excavation Safety: Make and maintain all excavations and slopes in accordance with OSHA excavation safety standards. The Contractor is solely responsible for designing and constructing stable, temporary excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The Contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed

those specified in local, state, and federal safety regulations. In some cases, the use of shoring, bracing, or trench boxes may be required. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Excavation Instability: Excavation stability and caving problems may occur due to the granular soil. Additionally, sand and silt seams were present in the clay, and the near surface clay in areas contained calcareous leachate seams, which are sometimes fissured. The instability problems will generally depend upon the excavation depth, length of time the excavations remain open, inclination of excavation side-walls, magnitude and location of surcharges near the excavations, groundwater levels, and the suitability of any needed dewatering systems.

Erosion Control: The surface soils may be erodible. Therefore, the Contractor should provide and maintain good site drainage during earthwork operations to maintain the integrity of the surface soils. All erosion and sedimentation controls should be in accordance with sound engineering practices and local requirements.

Drain Tile: Although not encountered, drain tile may exist at the site. Relocate any drain tile around the proposed development and discharged to suitable drainage facilities on a permanent basis. Do not plug drain tile because it may drain large adjacent areas. Repair and/or relocate any damaged drain tile so drainage is directed away from the proposed building and other structure areas, as needed.

Bidding/Estimating Considerations: Contractors bidding or undertaking any work at the site should examine the results of the subsurface exploration, satisfy themselves as to the adequacy of the information for bidding and construction, make their own interpretation of the data, and consider the effect it may have on their cost proposal, construction techniques, schedule, and equipment capabilities. Furthermore, contractors should complete any additional fieldwork and investigation they deem necessary to properly prepare a cost proposal for the site work. Soil borings do not provide the same wide-scale view of the subsurface conditions that is obtained during site grading, excavation or other aspects of earthwork construction. Additional scope may be required to obtain more detailed subsurface information needed for earthwork bid preparation, which could include test pits to better understand the lateral and vertical extents of the subsurface materials of concern such as existing undocumented fill. Even with this additional information, budget contingencies should be carried in construction to help cover potential variations in subsurface conditions.

7.0 CLOSING

A comprehensive subsurface exploration, possibly including water level observation wells, and a geotechnical engineering analysis is recommended to be performed after specific details of the development are known to further define the subsurface conditions, and provide more specific recommendations regarding design of the foundations, floor slabs, basement walls and other planned development features. This report includes only preliminary recommendations and is not intended to be used for the final design.

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project. The recommendations contained in this report represent our opinions arrived at in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this report.

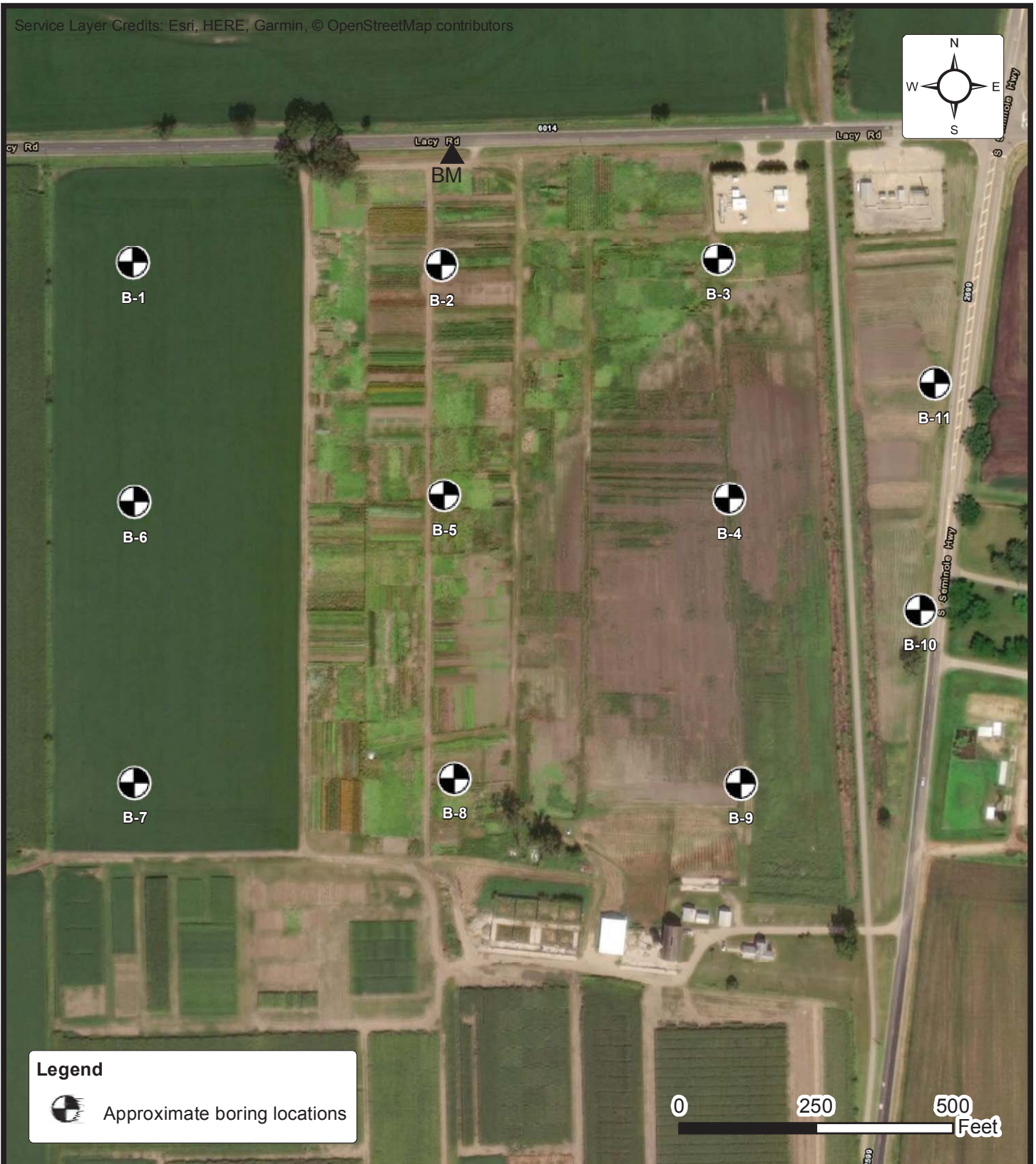
The description of the proposed project is based on information provided to ECS by you. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend ECS be allowed to review the project's plans and specifications pertaining to our services so that we may ascertain consistency of those plans/specifications with the intent of the geotechnical report.

Field observations and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design and construction recommendation. We recommend that the Owner retain these quality assurance services and that ECS be involved throughout construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Drawings & Reports

Boring Location Diagram



Legend



Approximate boring locations



Boring Location Diagram PRELIMINARY INVESTIAGTION

FITCHBURG, WI

RETTLER CORPORATION

ENGINEER
ILM

SCALE
1" = 250'

PROJECT NO.
59:1604

SHEET
1 OF 1

DATE
3/8/2019

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Test Boring Logs B1 through B11



REFERENCE NOTES FOR BORING LOGS

MATERIAL ^{1,2}	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL³ MAN-PLACED SOILS
	GW WELL-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GP POORLY-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GM SILTY GRAVEL gravel-sand-silt mixtures
	GC CLAYEY GRAVEL gravel-sand-clay mixtures
	SW WELL-GRADED SAND gravelly sand, little or no fines
	SP POORLY-GRADED SAND gravelly sand, little or no fines
	SM SILTY SAND sand-silt mixtures
	SC CLAYEY SAND sand-clay mixtures
	ML SILT non-plastic to medium plasticity
	MH ELASTIC SILT high plasticity
	CL LEAN CLAY low to medium plasticity
	CH FAT CLAY high plasticity
	OL ORGANIC SILT or CLAY non-plastic to low plasticity
	OH ORGANIC SILT or CLAY high plasticity
	PT PEAT highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION	PARTICLE SIZES	
Boulders	12 inches (300 mm) or larger	
Cobbles	3 inches to 12 inches (75 mm to 300 mm)	
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")	<0.074 mm (smaller than a No. 200 sieve)	

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_p ⁴	SPT ⁵ (BPF)	CONSISTENCY ⁷ (COHESIVE)
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

RELATIVE AMOUNT ⁷	COARSE GRAINED (%) ⁸	FINE GRAINED (%) ⁸
Trace	≤5	≤5
Dual Symbol (ex: SW-SM)	10	10
With	15 - 20	15 - 25
Adjective (ex: "Silty")	≥25	≥30

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT ⁵	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

WATER LEVELS ⁶		
	WL	Water Level (WS)(WD) (WS) While Sampling (WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

¹Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.

²To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

³Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

⁴Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

⁵Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).

⁶The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

⁷Minor deviation from ASTM D 2488-09 Note 16.

⁸Percentages are estimated to the nearest 5% per ASTM D 2488-09.

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B1-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - - PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% STANDARD PENETRATION BLOWS/FT	
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL		

BOTTOM OF CASING LOSS OF CIRCULATION					SURFACE ELEVATION 300.4 +/-		WATER LEVELS		ELEVATION (FT) BLOWS/6"

0	S-1	SS	24	10	Topsoil Thickness [18"] +/-	300	6	
	S-2	SS	24	14	(CL) Crop tillage, LEAN CLAY WITH SILT, trace organic clay, brown, moist, firm to stiff		3	
					(CL) Loess, LEAN CLAY, brown, moist, firm to stiff		2	
	S-3	SS	24	14	(CL) Glacial outwash, SANDY LEAN CLAY, brown and light brown, moist, firm to stiff		3	
5					(SP-SC) Glacial outwash, MEDIUM SAND WITH CLAY, brown, moist, medium dense to loose	295	5	
	S-4	SS	18	12			6	
							5	
	S-5	SS	18	8			5	
10					(SP) Glacial outwash, FINE SAND, trace silt, brown and light brown, moist, loose	290	3	
	S-6	SS	18	14			2	
							3	
	S-7	SS	18	12			2	
15					END OF BORING @ 15'	285	3	
20						280		
25						275		
30						270		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.					
WL WS ☐ WD ☒		BORING STARTED 03/01/19		CAVE IN DEPTH	
WL(SHW) WL(ACR) 15		BORING COMPLETED 03/01/19		HAMMER TYPE Auto	
WL		RIG ATV FOREMAN GB/KO		DRILLING METHOD 3.25" HSA 0' to 13.5'	

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B2-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		ROCK QUALITY DESIGNATION & RECOVERY RQD% --- REC% --- PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% ⊗ STANDARD PENETRATION BLOWS/FT	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [18"] +/-				10
	S-1	SS	24	18	(CL) Loess, LEAN CLAY, brown, moist, firm to very stiff			295	8
	S-2	SS	24	6			4		
5	S-3	SS	24	0	(SP) Glacial outwash, FINE TO MEDIUM SAND, trace gravel and silt, brown and light brown, moist, loose to medium dense			290	4
	S-4	SS	18	10			4		
	S-5	SS	18	10			4		
10	S-6	SS	18	16	(SP-SM) Glacial outwash, FINE SAND WITH SILT, light brown, moist, medium dense			285	5
	S-7	SS	18	16	(ML) Glacial outwash, SANDY SILT, light brown and brown, moist to wet, stiff to very stiff		8		
15					END OF BORING @ 15'			280	6
20								275	7
25								270	
30									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL WS ☐ WD ☒	BORING STARTED 03/01/19	CAVE IN DEPTH
WL(SHW) WL(ACR)	BORING COMPLETED 03/01/19	HAMMER TYPE Auto
WL	RIG ATV FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B3-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		ROCK QUALITY DESIGNATION & RECOVERY RQD% — — — REC% ——— PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% STANDARD PENETRATION BLOWS/FT	
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL		

BOTTOM OF CASING		LOSS OF CIRCULATION		SURFACE ELEVATION 293.1 +/-		WATER LEVELS		ELEVATION (FT)		BLOWS/6"	
0		S-1		SS		24		18		Topsoil Thickness [16"] +/-	
1		S-2		SS		24		6		(CL) Loess, LEAN CLAY, brown and grayish brown, moist, firm to very stiff	
5		S-3		SS		24		14		(CL) Glacial outwash, LEAN CLAY, gray, moist, firm to stiff	
6		S-4		SS		18		6		(SM) Glacial outwash, SILTY MEDIUM SAND, trace gravel, brown and reddish yellow, moist to wet, loose	
7		S-5		SS		18		10		(ML) Glacial outwash, SANDY SILT, brown, wet, soft	
10		S-6		SS		18		16		(SP-SM) Glacial outwash, FINE SAND WITH SILT, brown and light brown, moist, very loose	
14		S-7		SS		18		18		(ML) Glacial outwash, SANDY SILT, brown, moist, firm	
15										END OF BORING @ 15'	
20											
25											
30											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.			
WL 9 WS ☐ WD ☒		BORING STARTED 03/01/19	CAVE IN DEPTH
WL(SHW) WL(ACR)		BORING COMPLETED 03/01/19	HAMMER TYPE Auto
WL		RIG ATV FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B5-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		CALIBRATED PENETROMETER TONS/FT² ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% ——— PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% STANDARD PENETRATION BLOWS/FT			
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL			ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING			LOSS OF CIRCULATION	BLOWS/6"

0					Topsoil Thickness [16"] +/-		10
	S-1	SS	24	16	(CL) Loess, LEAN CLAY, brown, moist, firm to very stiff		7
	S-2	SS	24	7	(CL) Glacial outwash, LEAN CLAY, lenses of sand, gray and brown, moist, stiff		2
5	S-3	SS	24	7	(SP-SM) Glacial outwash, FINE SAND WITH SILT, brown and light brown, moist, medium dense to loose		5
	S-4	SS	18	12	(SM) Glacial outwash, SILTY FINE SAND, brown, wet to moist, very loose to loose		6
	S-5	SS	18	12			3
10	S-6	SS	18	14			5
	S-7	SS	18	12			4
15	END OF BORING @ 15'						1
							5
20							
25							
30							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.					
WL 10 WS ☐ WD ☒		BORING STARTED 03/01/19		CAVE IN DEPTH	
WL(SHW) WL(ACR)		BORING COMPLETED 03/01/19		HAMMER TYPE Auto	
WL		RIG ATV FOREMAN GB/KO		DRILLING METHOD 3.25" HSA 0' to 13.5'	

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B6-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING	STATION	ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - - PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% ⊗ STANDARD PENETRATION BLOWS/FT	
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)		

DESCRIPTION OF MATERIAL					ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
BOTTOM OF CASING					LOSS OF CIRCULATION			
SURFACE ELEVATION 297.3 +/-								

0	S-1	SS	24	16	Topsoil Thickness [16"] +/-		7	
					(CL) Loess, LEAN CLAY, brown, moist, firm to stiff		7	
	S-2	SS	24	12			4	
					(SC) Glacial outwash, CLAYEY FINE SAND, brown, moist, loose		3	
5	S-3	SS	24	12	(SM) Glacial outwash, SILTY FINE SAND, brown, moist, loose		2	
					(SP-SM) Glacial outwash, FINE SAND WITH SILT, trace gravel, light brown, moist, loose to medium dense		3	
	S-4	SS	18	5			4	
					(SP-SM) Glacial outwash, FINE SAND WITH SILT, lenses of silt, brown and light brown, moist, loose to medium dense		5	
10	S-5	SS	18	12			6	
							2	
	S-6	SS	18	14			2	
					(SM) Glacial outwash, SILTY FINE SAND, light brown, moist to wet, medium dense		3	
							5	
15	S-7	SS	18	10			6	
							8	
							7	
							8	
							9	
20								
25								
30								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 10 WS ☐ WD ☒	BORING STARTED 03/01/19	CAVE IN DEPTH
WL(SHW) WL(ACR)	BORING COMPLETED 03/01/19	HAMMER TYPE Auto
WL	RIG ATV FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B8-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - - PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% ● ▲ ⊗ STANDARD PENETRATION BLOWS/FT	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING LOSS OF CIRCULATION			
					SURFACE ELEVATION 291.2 +/-			
0					Topsoil Thickness [16"] +/-		290	11
	S-1	SS	24	10	(CL) Alluvium, SANDY LEAN CLAY, dark brown, moist, firm			6
	S-2	SS	24	11	(SP-SC) Alluvium, FINE SAND WITH CLAY, brown, moist, loose			1:0
	S-3	SS	24	18	(OL) Swamp deposit, ORGANIC LEAN CLAY, very dark brown, moist to wet, soft to firm			0.5
	S-4	SS	18	16	(CL) Glacial outwash, LEAN CLAY, gray, moist, firm			8
	S-5	SS	18	12	(SM) Glacial outwash, SILTY FINE TO MEDIUM SAND, trace gravel, brown, moist to wet, loose			7
	S-6	SS	18	12				7
	S-7	SS	18	16				5
					END OF BORING @ 15'			
15								
20								
25								
30								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.					
WL 10 ☐ WS ☒ WD	BORING STARTED 03/01/19		CAVE IN DEPTH		
WL(SHW) WL(ACR)	BORING COMPLETED 03/01/19		HAMMER TYPE Auto		
WL	RIG ATV	FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'		

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B9-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING	STATION	ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - - PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% STANDARD PENETRATION BLOWS/FT	
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)		

DESCRIPTION OF MATERIAL					ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
BOTTOM OF CASING					LOSS OF CIRCULATION			
SURFACE ELEVATION					289.6 +/-			
0					Topsoil Thickness [15"] +/-		285	6
	S-1	SS	24	7	(CL) Glacial outwash, LEAN CLAY WITH SILT, grayish brown and gray, moist, firm to stiff		285	1
	S-2	SS	24	8				2
5	S-3	SS	24	14	(SM) Glacial outwash, SILTY FINE SAND, brown and reddish brown, moist, loose		280	3
	S-4	SS	18	14				4
	S-5	SS	18	14	(SM) Glacial outwash, SILTY FINE SAND WITH GRAVEL, brown, wet, very loose		275	5
10	S-6	SS	18	16	(SM) Glacial outwash, SILTY FINE SAND, brown, moist, loose to very loose			1
	S-7	SS	18	18				2
15	END OF BORING @ 15'							3
								2
20								
25								
30								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 10 WS ☐ WD ☒	BORING STARTED 03/01/19	CAVE IN DEPTH
WL(SHW) WL(ACR) 7	BORING COMPLETED 03/01/19	HAMMER TYPE Auto
WL	RIG ATV FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B10-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		CALIBRATED PENETROMETER TONS/FT² ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% ——— PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% STANDARD PENETRATION BLOWS/FT			
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL			ENGLISH UNITS	WATER LEVELS ELEVATION (FT)
					BOTTOM OF CASING			LOSS OF CIRCULATION	

0					Topsoil Thickness [16"] +/-		290	7					
	S-1	SS	24	18	(CL) Crop tillage, LEAN CLAY, trace organic clay and fine roots, grayish brown, moist, stiff to very stiff (CL) Glacial outwash, LEAN CLAY, grayish brown, moist, stiff to very stiff (SM) Glacial outwash, SILTY FINE SAND, brown and light brown, moist to wet, loose to very loose			2	6				
	S-2	SS	24	10				4	9				
	S-3	SS	24	10				5	5				
5	S-4	SS	18	12				3	8				
	S-5	SS	18	12				4	8				
10	S-6	SS	18	12				2	5				
	S-7	SS	18	16				3	1				
15					END OF BORING @ 15'		2						
20													
25													
30													

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.					
WL 6	WS ☐	WD ☒	BORING STARTED	03/01/19	CAVE IN DEPTH
WL(SHW)	WL(ACR)		BORING COMPLETED	03/01/19	HAMMER TYPE Auto
WL			RIG ATV	FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

CLIENT Rettler Corporation				Job #: 59:1604-A	BORING # B11-19	SHEET 1 OF 1	
PROJECT NAME 48 Acre Parcel Subsurface Exploration				ARCHITECT-ENGINEER			
SITE LOCATION Fitchburg, Dane County, WI							

NORTHING		EASTING		STATION		ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - - PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% ● ▲ STANDARD PENETRATION BLOWS/FT	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING	LOSS OF CIRCULATION			
					SURFACE ELEVATION	290.2 +/-			
0					Topsoil Thickness [18"] +/-			290	8
	S-1	SS	24	18	(CL) Crop tillage, LEAN CLAY, trace organic clay and fine roots, grayish brown and brown, moist, stiff				4
	S-2	SS	24	16					
					(CL) Glacial outwash, LEAN CLAY, grayish brown, moist, stiff				4
	S-3	SS	18	16	(SM) Glacial outwash, SILTY FINE SAND, brown, moist to wet, loose				5
5								285	2
	S-4	SS	18	10					3
					(SP-SM) Glacial outwash, FINE SAND WITH SILT, yellowish brown, moist to wet, loose to very loose				3
	S-5	SS	18	14					1
10								280	2
	S-6	SS	18	14					1
					(SM) Glacial outwash, SILTY FINE SAND, brown, moist, very loose				2
	S-7	SS	18	14					1
15					END OF BORING @ 15'			275	2
20								270	
25								265	
30								260	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 6 WS ☐ WD ☒	BORING STARTED 03/01/19	CAVE IN DEPTH
WL(SHW) WL(ACR)	BORING COMPLETED 03/01/19	HAMMER TYPE Auto
WL	RIG ATV FOREMAN GB/KO	DRILLING METHOD 3.25" HSA 0' to 13.5'

APPENDIX C – Supplemental Report Documents

Important Information about This Geotechnical-Engineering Report

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be, and, in general, if you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying it.* A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may

perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old*.

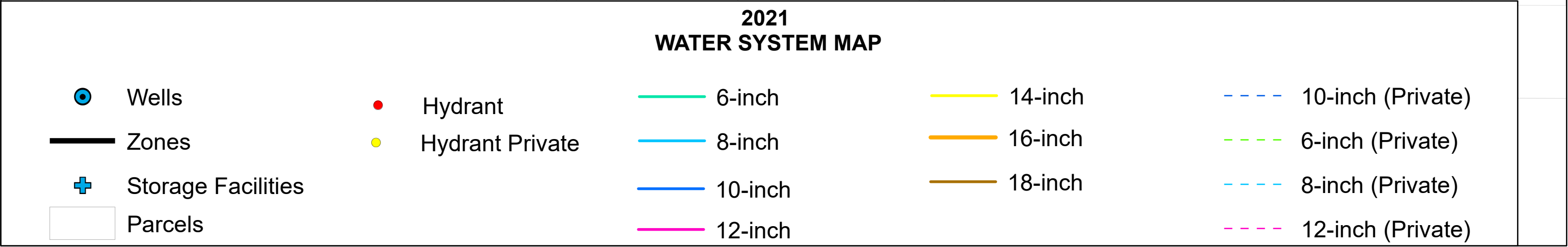
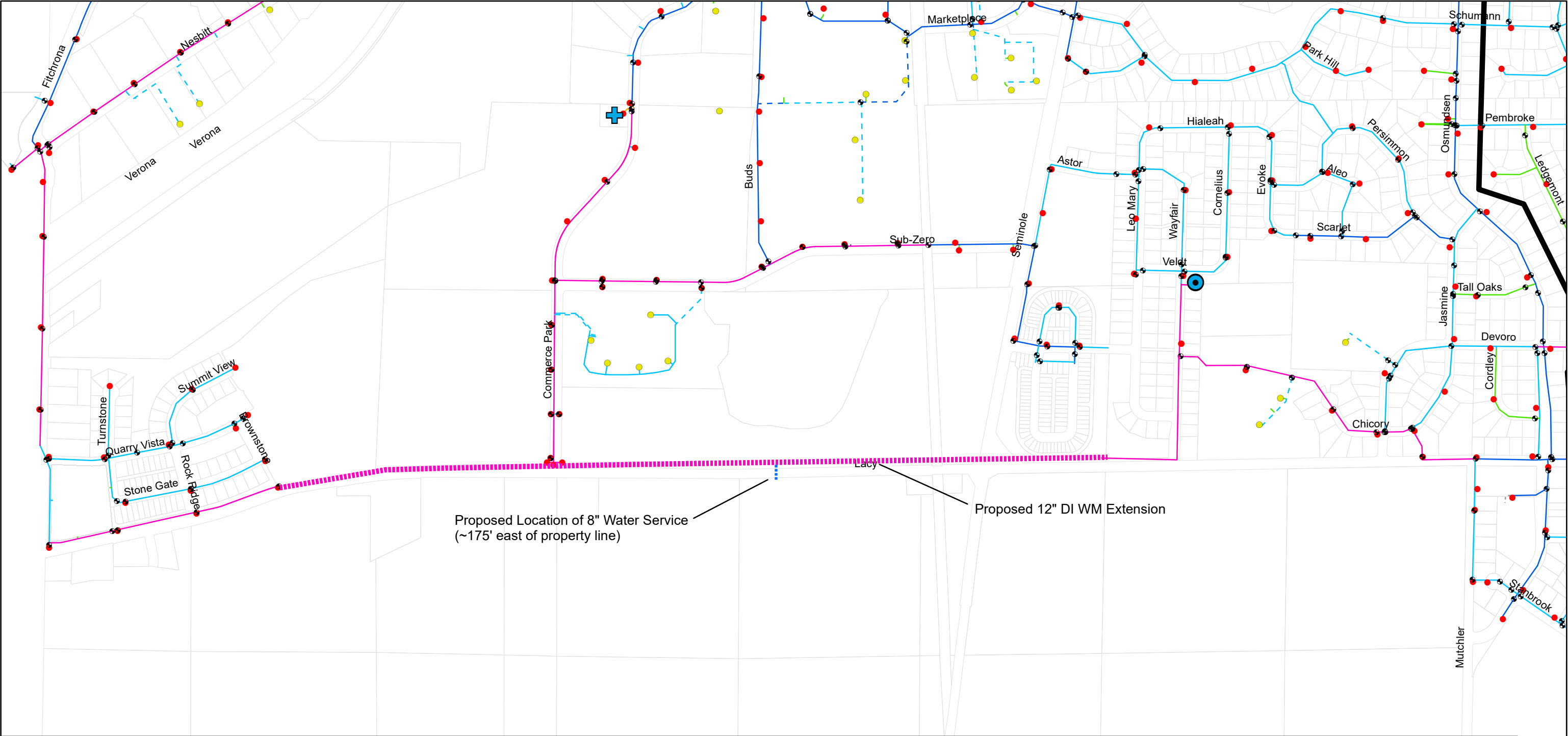
Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

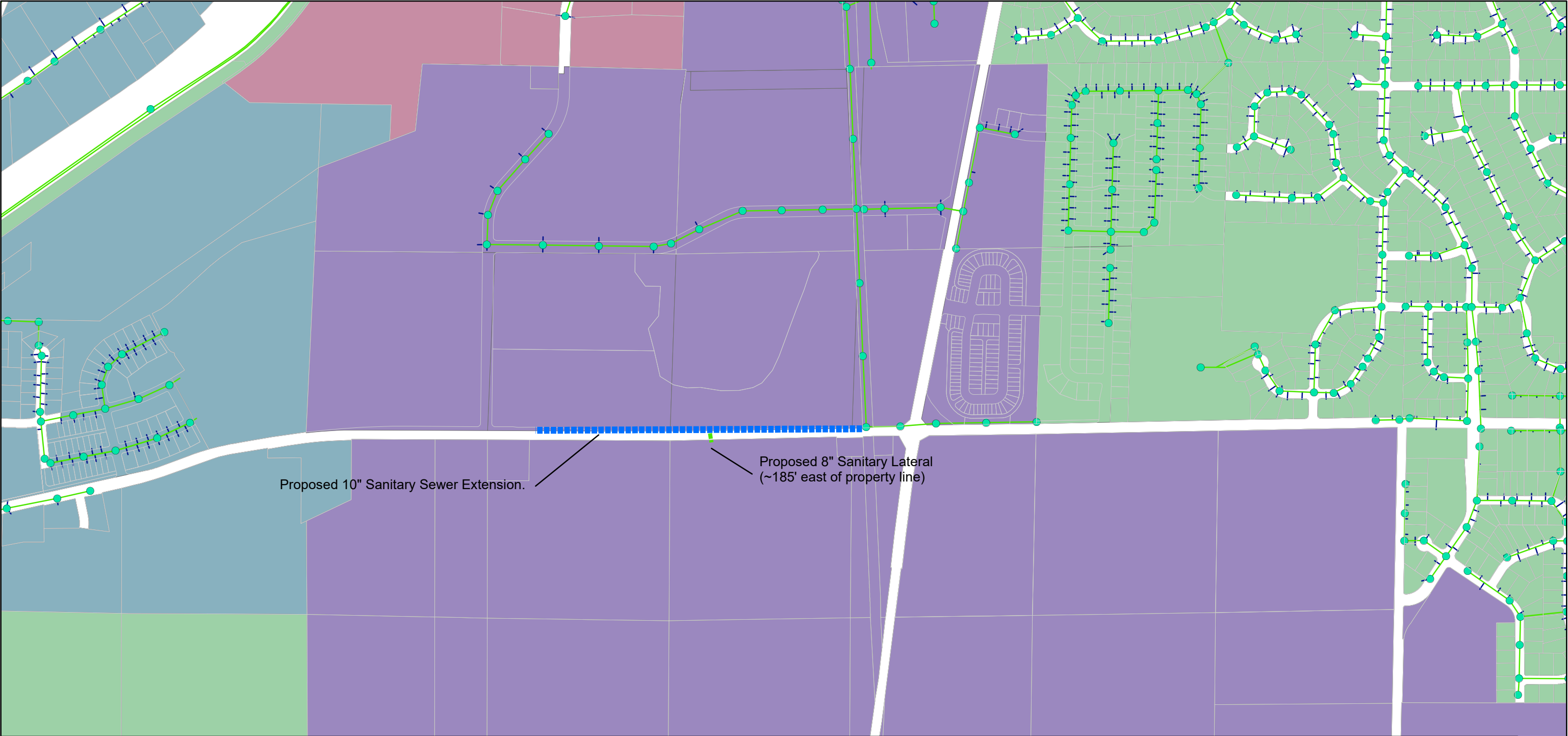
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration*. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists*.



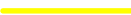
Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org





**2021
WATER SYSTEM MAP**

- | | | | | |
|--|---|---|---|---|
|  Wells |  Hydrant |  6-inch |  14-inch |  10-inch (Private) |
|  Zones |  Hydrant Private |  8-inch |  16-inch |  6-inch (Private) |
|  Storage Facilities |  Seminole Hwy
Interceptor
Service Area |  10-inch |  18-inch |  8-inch (Private) |
|  Parcels | |  12-inch | |  12-inch (Private) |



AECOM
1350 Deming Way
Middleton, WI 53562
aecom.com

Project name:
Edgewood TIA

Project ref:
MSCA Order Task 1

From:
Tyler Tkachuk, PE, PTOE

Date:
August 27, 2021

To:
John Kneer, PLA, ASLA
Rettler Corporation

Andrew McFadden, PE,
City of Fitchburg

Edgewood Athletic Campus Driveways & Circulation Memo

Introduction

A Development Master Plan was completed for the Edgewood College Athletic Campus. The new athletic campus is located in the southwest quadrant of the Seminole Highway and Lacy Road intersection in the City of Fitchburg. The campus includes a baseball field, softball field, soccer stadium, and tennis courts. Three parking lots are proposed in the new campus with 479 parking stalls and access from Lacy Road via three driveways. See **Attachment A** for the Edgewood College Athletic Campus Master Plan.

The purpose of this memo is to evaluate the circulation at the Lacy Road access points using a very conservative worst-case scenario for events at the site. A traffic impact study (TIA) for Lacy Road was completed for the City of Fitchburg in June 2021. The TIA included intersection control evaluation and geometric recommendations at the intersections of Lacy Road & Seminole Highway and Lacy Road & Fitchrona Road to accommodate current and future projected traffic. The future projected traffic included many developments in the area, including the Edgewood athletic campus.

Methodology

The existing year analysis (base year) uses 2020 volumes obtained from the previous TIA completed for the City of Fitchburg for the intersections of Lacy Road & Seminole Highway and Lacy Road & Fitchrona Road. The Edgewood College Athletic Director provided data regarding events, practices, and trainings anticipated on campus along with the breakdown of audience attendance per event type presented in **Attachment B**. Approximately, once a week during the fall/spring it is likely that two sporting events will occur on the same night at the sports campus which would be our worst-case event scenario. Otherwise, a “normal” sports campus night would include one sporting event and several practices.

ITE trip generation was not used for this analysis as none of the ITE land uses are applicable for this development type. To determine the maximum number of trips generated by the athletic campus during the PM peak hour, some very conservative assumptions are made:

- 1- A maximum of two events can occur simultaneously accounting for 400 attendees entering the site and estimated 200 attendees exiting during the PM peak. This assumes both events start during the peak hour. It also assumes half of the vehicles leave in the peak hour, potentially before the event is over.
- 2- None of the attendees are carpooling, therefore 400 vehicles would be entering, and 200 vehicles would be leaving the sports campus during the PM peak.
- 3- 95% of attendees are generated from the east and 5% from the west of the sports campus. The most direct access from Edgewood and surrounding freeways is through Seminole highway.
- 4- 75% of attendees will use the right parking lot and 25% will use the left one. This is applicable for cars entering and exiting during the PM peak.

- a. Cars exiting the right parking to head east will be split with 40% using the center driveway and 60% using the right driveway.

Attachment C includes Build 2020 (Background + Edgewood Traffic) traffic volumes assuming the maximum possible athletic event trips. The traffic volumes used for this traffic analysis was a very conservative worst-case scenario for Athletic events. The “normal” traffic during the peak hours is expected to be much lower than Edgewood traffic volumes used in the analysis.

The City of Fitchburg provided plans and profiles for the Lacy Road West Reconstruction Project anticipated to be built in 2022. In the plans, the City of Fitchburg is proposing left turn lanes into the Edgewood sports campus to be ~150 ft at the west access point and ~200 ft long at the middle access point.

Analysis and Results

The PM peak analysis was conducted using Synchro 11 to determine the driveway configurations and turn bay lengths needed to accommodate existing traffic generated by the athletic campus during the worst-case scenario.

Synchro results show that the proposed left turn lanes proposed by the City of Fitchburg on Lacy Road can fit all queues in the worst-case scenario with 400 vehicles entering and 200 vehicles exiting the campus during the PM peak hour. The AM peak hour was not analyzed because events at the athletic campus do not occur during this time. The three proposed driveways to access the development from Lacy Road are anticipated to operate at an acceptable level of service (LOS).

Attachment D includes the Synchro reports using HCM 6th for the three stop-controlled driveways. The anticipated 95% queue for both left turn lanes on Lacy Road into the athletic campus was one vehicle (25 feet).

A one car queue seems very unlikely based on how traffic typically arrives and leaves sporting events. It is more likely that the vehicles attending the athletic events will come closer to the start of the event as well as leaving the event shortly after it has ended. Two additional scenarios were analyzed to confirm queue lengths under these conditions.

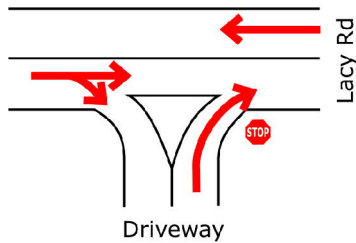
Scenario 1 represents increasing the vehicles entering the sports campus. The analysis includes doubling (2x) all the turning volumes into the campus and changing the Peak Hour Factor (PHF) to 1. Doubling the vehicles turning into campus represents 50% of vehicles entering in the 15 minutes prior to the event and the other 50% of vehicles entering between 15 minutes and 1 hour prior to the event. The anticipated maximum 95% queue for both left turn lanes on Lacy Road into the athletic campus was three vehicles (75 feet). **Attachment E** includes the Synchro reports using HCM 6th for the three stop-controlled driveways.

Scenario 2 represents increasing vehicles exiting the sports campus. The analysis includes tripling (3x) all the turning volumes exiting the campus and changing the PHF to 1. Tripling the vehicles exiting the campus represents 75% of the vehicles exiting in 15 minutes after the event has ended and the other 25% of vehicles exiting between 15 minutes and 1 hour after the event has ended. The anticipated maximum 95% queue for both left turn lanes on Lacy Road into the athletic campus was one vehicle (75 feet). **Attachment F** includes the Synchro reports using HCM 6th for the three stop-controlled driveways.

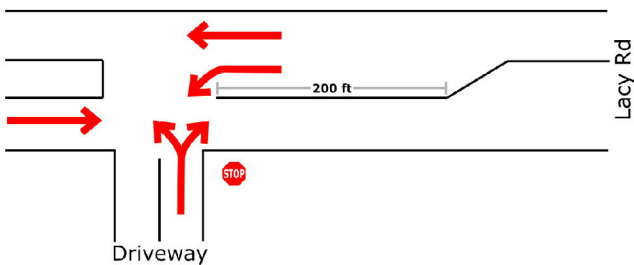
Circulation

For the driveways to operate at an acceptable level of service (LOS) and to minimize delays and queue spillbacks onto Lacy Road, the following driveway configurations are recommended:

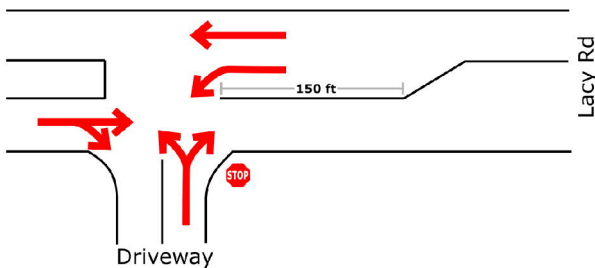
- 1- Right Driveway: The right driveway provides access to the right parking lot. This driveway will operate as right-in right-out with left turns being restricted from the parking lot and Lacy Road. In addition, we are recommending that a pork chop island be installed to prevent these movements.



- 2- Center Driveway: The center driveway also provides access to the right parking lot. The 200 ft left turn lane proposed in the City of Fitchburg plans will accommodate the anticipated attendees during the peak hour entering this parking lot.



- 3- Left Driveway: The left driveway provides the only access to the left parking lot. The 150 ft left turn lane proposed in the City of Fitchburg roadway will accommodate the anticipated attendees during the peak hour at this driveway.



Conclusions

These driveway configurations along with the proposed turn lanes by the City of Fitchburg plans will accommodate the anticipated trips entering and exiting the Edgewood College Athletic Campus during the PM peak hour for all three conservative scenarios. It is also recommended that the left parking lot be connected to the right parking lot to provide a second access point (for safety) to exit the left parking lot.



Attachment B

Activity	Days per weekday	Hours per event	Days per weekend	Hours per event	Approximate Attendance per event	Type of use
MSOC practices	5	3	1	4	40	Routine
MSOC competitions	2	4	1	9	200	Routine
WSOC practices	5	3	1	4	40	Routine
WSOC competitions	2	4	1	9	200	Routine
WGLF practices	3	2	1	4	15	Routine
MGLF practices	3	2	1	4	15	Routine
BSBL Practices	3	3	2	5	45	Routine
BSBL competitions	n/a	n/a	n/a	9 if one event	200	Not every year
SFTBL practices	3	3	2	5	30	Routine
SFTBL competitions	n/a	n/a	n/a	9 if one event	200	Not every year
MLX practices	3	3	2	4	50	Routine
MLX contests	n/a	n/a	n/a	8 if one event	200	Not every year
WLX practices	3	3	2	4	30	Routine
WLX contests	n/a	n/a	n/a	8 if one event	200	Not every year
MTEN practices	3	3	1	3	20	Routine
MTEN competitions	n/a	n/a	n/a	n/a	50	Routine
WTEN practices	5	3	1	3	20	Routine
WTEN competitions	2	8	1	8	50	Routine
Training	5	8-10	2	5-8	50-100	Routine
Camps (total dates)	4 (8-10)	4-6	1 (8-12)	4-6	75	Sporadic use
Peak Use Times	3pm - 10pm			11am - 4pm		

Attachment B

Activity	Days per weekday	Hours per event	Days per weekend	Hours per event	Approximate Attendance per event	Type of use
MLX practices	5	3	2	4	50	Routine
MLX contests	1	4	1	4	200	Not every year
WLX practices	5	3	2	4	30	Routine
WLX contests	1	4	1	4	200	Not every year
TRK practices	5	3	1	3	75	Routine
Training	5	8-10	2	5-8	100-200	Routine
Camps	4	4-6	1	4-6	75	Routine
Peak Use Times	3pm - 10pm			11am - 4pm		

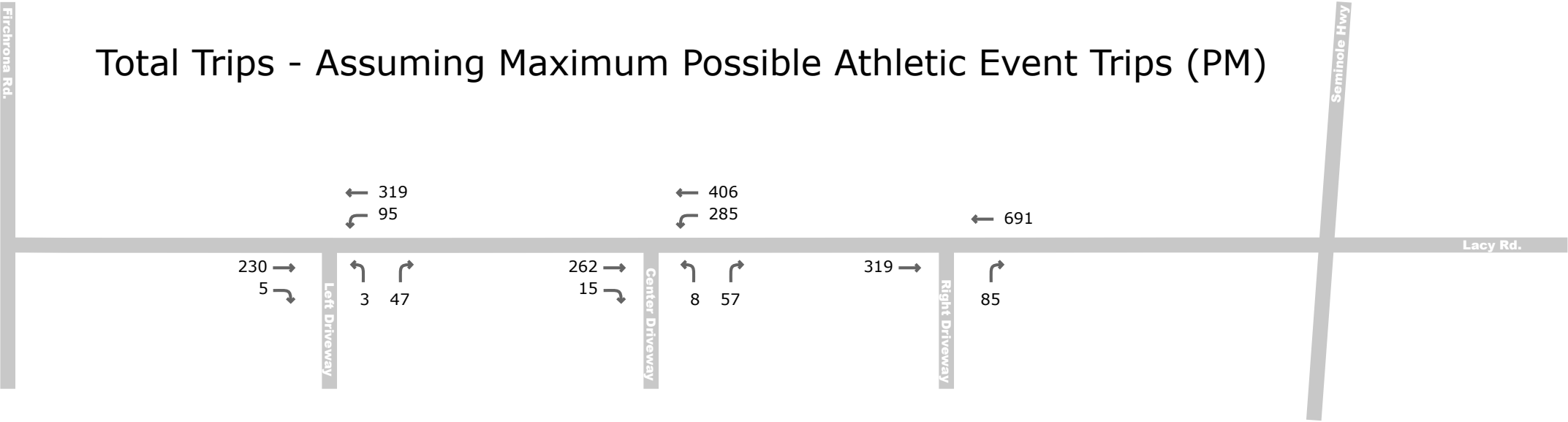
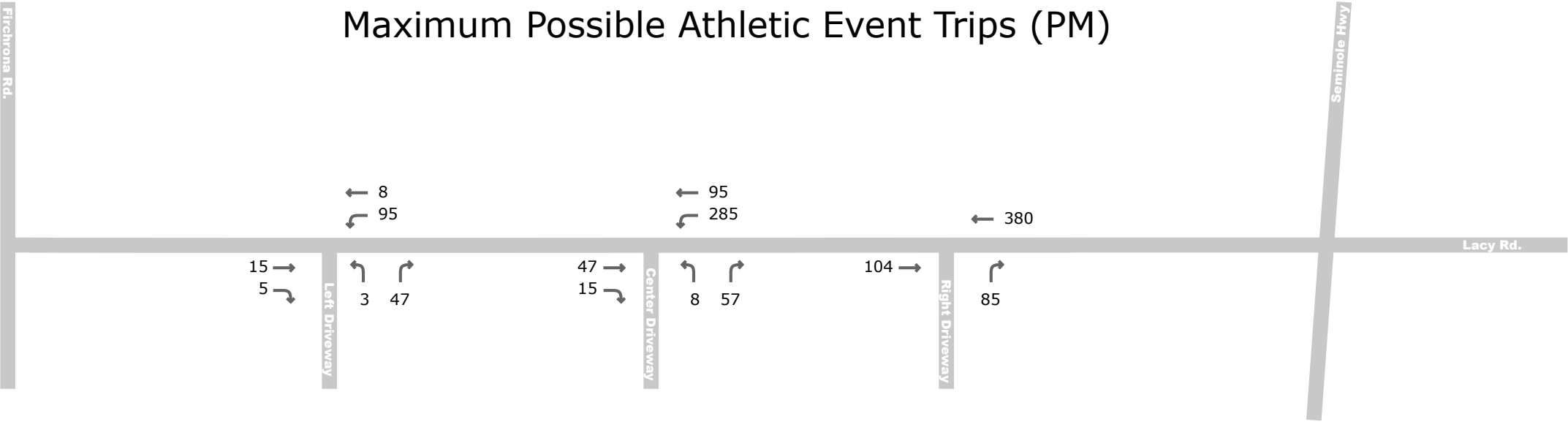
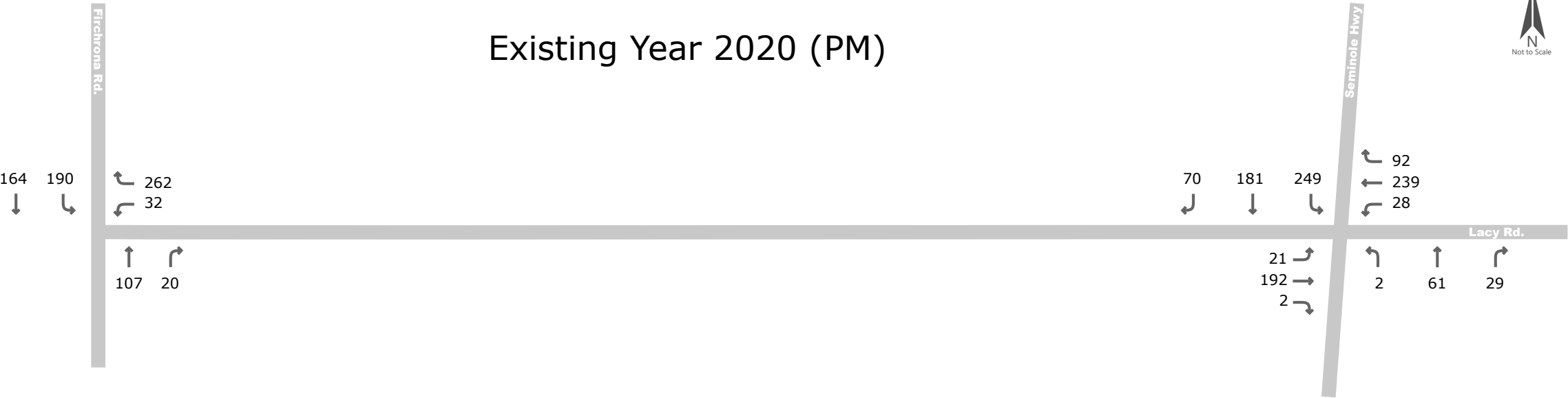
Attachment B

Activity	Days per weekday	Hours per event	Days per weekend	Hours per event	Approximate Attendance per event	Type of use
MSOC practices	3	3	2	5	40	Routine
MSOC competitions	n/a	n/a	n/a	6 if one event	200	Routine
WSOC practices	3	3	2	5	40	Routine
WSOC competitions	n/a	n/a	n/a	6 if one event	200	Routine
WGLF practices	3	2	1	4	15	Routine
MGLF practices	3	2	1	4	15	Routine
BSBL Practices	4	3	2	5	45	Routine
BSBL competitions	2	9	1	12	200	Not every year
SFTBL practices	4	3	2	5	30	Routine
SFTBL competitions	2	8	1	10	200	Not every year
MLX practices	5	3	2	4	50	Routine
MLX contests	1	4	1	4	200	Not every year
WLX practices	5	3	2	4	30	Routine
WLX contests	1	4	1	4	200	Not every year
MTEN practices	5	3	1	3	20	Routine
MTEN competitions	2	8	1	8	50	Routine
WTEN practices	5	3	1	3	20	Routine
WTEN competitions	2	8	1	8	50	Routine
Training	5	8-10	2	5-8	50-100	Routine
Camps (total dates)	4 (8-10)	4-6	1 (8-12)	4-6	75	Sporadic use
Peak Use Times	3pm - 10pm			11am - 4pm		

Attachment B

Activity	Days per weekday	Hours per event	Days per weekend	Hours per event	Approximate Attendance per event	Type of use
Training	5	4-6	2	4-6	40	Routine
Camps	4	6-8	2	4-6	75	Routine
Recruiting Events	4	12	2	12	200	Sporadic use
Peak Use Times	3pm - 10pm			9am - 10pm		

In	Number of Attendees	400
	% from East	95%
	% from West	5%
Out	Number of Attendees	200
	% to East	95%
	% to West	5%
Split between Right and Left Parking Lot		
Left	125	25%
Right	354	75%



HCM 6th TWSC
7: Right Driveway & Lacy Road/Lacy Rd

Existing Year Analysis

08/27/2021

Intersection

Int Delay, s/veh 0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	319	0	0	691	0	85
Future Vol, veh/h	319	0	0	691	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	343	0	0	743	0	91

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	0	0
Stage 1	-	0	0
Stage 2	-	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	700	-	-
HCM Lane V/C Ratio	0.131	-	-
HCM Control Delay (s)	10.9	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-

HCM 6th TWSC

1: Center Driveway & Lacy Road

Existing Year Analysis

08/27/2021

Intersection

Int Delay, s/veh 3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↘	↑	↘	
Traffic Vol, veh/h	262	15	285	406	8	57
Future Vol, veh/h	262	15	285	406	8	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	282	16	306	437	9	61

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	298
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1263
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1263
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	467	-	-	1263	-
HCM Lane V/C Ratio	0.15	-	-	0.243	-
HCM Control Delay (s)	14.1	-	-	8.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	1	-

HCM 6th TWSC
15: Left Driveway & Lacy Road

Existing Year Analysis

08/27/2021

Intersection

Int Delay, s/veh 1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	230	5	95	319	3	47
Future Vol, veh/h	230	5	95	319	3	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	247	5	102	343	3	51

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	252
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1313
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1313
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	728	-	-	1313	-
HCM Lane V/C Ratio	0.074	-	-	0.078	-
HCM Control Delay (s)	10.3	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	314	15	0	1071	0	85
Future Vol, veh/h	314	15	0	1071	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	314	15	0	1071	0	85

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 314
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 3.318
Pot Cap-1 Maneuver	-	0	0 - 726
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 726
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	726	-	-
HCM Lane V/C Ratio	0.117	-	-
HCM Control Delay (s)	10.6	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-

HCM 6th TWSC

1: Center Driveway & Lacy Road

Existing Year Analysis-Scenario 1

08/27/2021

Intersection						
Int Delay, s/veh	5.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↘	↑	↘	
Traffic Vol, veh/h	257	30	570	501	8	57
Future Vol, veh/h	257	30	570	501	8	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	257	30	570	501	8	57
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	287	0	1913	272
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	1641	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1275	-	75	767
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	174	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1275	-	41	767
Mov Cap-2 Maneuver	-	-	-	-	41	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	96	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		5.4		25.4	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	241	-	-	1275	-	
HCM Lane V/C Ratio	0.27	-	-	0.447	-	
HCM Control Delay (s)	25.4	-	-	10.1	-	
HCM Lane LOS	D	-	-	B	-	
HCM 95th %tile Q(veh)	1.1	-	-	2.4	-	

Intersection

Int Delay, s/veh 2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	240	10	190	319	3	47
Future Vol, veh/h	240	10	190	319	3	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	240	10	190	319	3	47

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	250
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1316
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1316
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	702	-	-	1316	-
HCM Lane V/C Ratio	0.071	-	-	0.144	-
HCM Control Delay (s)	10.5	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	-

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↵			↑		↗
Traffic Vol, veh/h	527	0	0	691	0	255
Future Vol, veh/h	527	0	0	691	0	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Free	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	527	0	0	691	0	255
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	527
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	0	0	-	0	551
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	551
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		17	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	WBT			
Capacity (veh/h)	551	-	-			
HCM Lane V/C Ratio	0.463	-	-			
HCM Control Delay (s)	17	-	-			
HCM Lane LOS	C	-	-			
HCM 95th %tile Q(veh)	2.4	-	-			

HCM 6th TWSC
1: Center Driveway & Lacy Road

Intersection						
Int Delay, s/veh	5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑		↘	↑	↘	
Traffic Vol, veh/h	356	15	285	406	23	171
Future Vol, veh/h	356	15	285	406	23	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	356	15	285	406	23	171
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	371	0	1340	364
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	976	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1188	-	168	681
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	365	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1188	-	128	681
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	277	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.7		18.9		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	450	-	-	1188	-	
HCM Lane V/C Ratio	0.431	-	-	0.24	-	
HCM Control Delay (s)	18.9	-	-	9	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	2.1	-	-	0.9	-	

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	230	5	95	334	9	141
Future Vol, veh/h	230	5	95	334	9	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	5	95	334	9	141
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	235	0	757	233
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	524	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1332	-	375	806
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1332	-	348	806
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	552	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.8		11		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	747	-	-	1332	-	
HCM Lane V/C Ratio	0.201	-	-	0.071	-	
HCM Control Delay (s)	11	-	-	7.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-	