State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay WI 54313-6727

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

September 24, 2021

Glenn Cummings, President
English Lake Protection nad Rehabilitation District
233 2nd St.
Hilbert WI 54129

Subject: Comprehensive Management Plan Addendum Approval

Dear Mr. Cummings,

Thank you for your efforts to understand, protect, and improve English Lake. This letter is to notify you that the August 2021 English Lake Comprehensive Management Plan Addendum meets the criteria under Administrative Code NR 193, and thus the Department of Natural Resources has approved the Plan update.

Approved management activities in the 2021 plan addendum and summarized below are eligible for funding under the Surface Water Grants program subject to the application requirements of the program.

Approved activities: Redirect two drain tile systems and construct a Water and Sediment Control Basin (WASCB) in the field north of English Lake to eliminate a total of 26.8 acres of water from agricultural land from discharging into the lake.

Thank you and Manitowoc County Soil and Water Conservation Department for your efforts to protect and improve English Lake.

Sincerely,

Mary Gansberg

Mary Gansberg
Water Resources Management Specialist

CC: Jerry Halverson and Laura Paletta, Manitowoc County Soil and Water Conservation Department

English Lake

Manitowoc County, Wisconsin

Comprehensive Management Plan Addendum

August 2021

Table of Contents

Figures and Maps

1.0 Introduction

In 2012, a Comprehensive Lake Management Plan was written by Onterra, LLC for English Lake, located in Manitowoc County. Management goals of this plan included: controlling Eurasian Water Milfoil while preventing the introduction of other aquatic invasive species, maintaining current water quality conditions, and increasing the English Lake Protection and Rehabilitation District's capacity to communicate information with lake stakeholders. This plan addendum includes management actions taken since 2012, identifies 2 drain tiles which were not included as external sources of phosphorus in Onterra's 2012 lake management plan, and offers solutions to eliminate discharge of these additional tile lines from entering English Lake.

2.0 Management Actions Taken since Lake Management Plan was Approved in 2012

- The English Lake Rehabilitation and Protection District was awarded an Aquatic Invasive Species Grant (# ACEI-117-12). Funding from this grant was used to eradicate Eurasian watermilfoil and other aquatic invasive species (AIS) from the lake. In 2012 and 2013, the aquatic herbicide DMA 4 IVM (liquid 2, 4-D) was applied to the lake.
- In 2012, 500 trees and shrubs were planted on steep-sloped cropland north of the lake.
- 2012 – Present, Volunteers regularly spray or do controlled burns to eliminate weeds in the prairie north of the lake.
- In 2013 – Present, a boat cleaning station was set up at the public boat launch. Lake District Members volunteer to do boat landing checks throughout the summer to stop the spread of AIS.
- In 2014, snorkel/divers were hired to pull Eurasian watermilfoil from the bottom of the lake bed as another way to control the spread of AIS.

- 44 Acres of agriculture cropland are being cropped using a no-till drill, vertical till, or chisel plow equipment to reduce soil erosion and discharge of nutrients to the lake.
- 91.4 Acres of the 95 Acres of cropland within the watershed, have a nutrient management plan that assist landowners and operators with managing the amount, source, placement and timing of nutrient applications. The plan also includes a soil erosion plan to keep soil loss within tolerable soil loss requirements.
- The Manitowoc County Soil and Water Conservation Department continuously educates landowners and operators on best management practices, and offers cost share dollars to apply conservation practices in the watersheds.

2.0 Management Action Outcomes

Eurasian watermilfoil has been and continues to be monitored in English Lake. Levels died back in 2015, but in certain years the plant is more prevalent, depending on weather patterns. The prairie on the north end is still flourishing and doing its job to increase wildlife habitat and retain runoff and nutrients from entering the lake.

Although there have been various best management practices implemented in the lake watershed in the past nine years, phosphorus levels continue to rise in English Lake, as seen in Graph 1. Using data collected during summer months, phosphorus levels have risen 17.7% in the past 10 years. This indicates that there is more to be done in the lake watershed.

3.0 New Management Challenges Identified

The 2012 Comprehensive Management Plan states that, “English Lake’s watershed covers approximately 226 acres of land in Manitowoc County.” Of these 226 acres, English Lake’s surface is 51 acres, leaving about 175 acres in the watershed that drains to the lake, of which 95 acres is agriculture cropland.

In spring 2021 Manitowoc County Soil and Water Conservation Department identified two tile drains out letting into English Lake that were not included in Onterra's 2012 Lake Management Plan or listed as external sources of phosphorus loading. SWCD received a complaint that a 12" tile drain was discharging brown water from a recent storm event into the north side of the lake. This was confirmed by SWCD and DNR during an on-site visit. A water sample was taken from the outlet of this tile (Tile 1) on May 3, 2021. Testing results came back from Badger Laboratories with a phosphorus (P) level of 0.94 mg/L and suspended solids concentration of 238 mg/L. These numbers are more than 45 times and 19 times over Wisconsin state water quality criteria of 20 micrograms per liter for deep seepage lakes, established in NR102.04(3) and NR102.04(5) to protect fish and aquatic life and recreational use.

Tile 1 begins approximately 975 feet to the north of the lake, in a depressed area in the crop field identified as ponded water area. (PWA). Using program software, SWCD determined that 11.5 acres of crop land storm water runoff and snow melt flows to and deposits in the depressed area, which then enters Tile 1 and outlets into English Lake.

While investigating Tile 1, an additional tile (Tile 2) was identified. Tile 2 discharges at the north-west corner of the lake. SWCD determined that this tile drains 12.0 cropland acres and delivers it into English Lake. These cropland acres also receive manure and fertilizer, suggesting that some nutrients and sediment are delivered through the tile into the lake.

4.0 Solutions

Discharge from Tile 1

By using the test results from the May 3 sample and the average annual rainfall for Manitowoc, WI, it was estimated that 38.0 pounds of phosphorus is discharging into English Lake annually through Tile 1.

The Manitowoc County Soil and Water Conservation Department recommends that to eliminate the discharge problem from Tile 1, a new tile should be installed to redirect the water to the north-west, away from English Lake. This proposed tile is identified by a blue dotted line on Map 2. It would be approximately 1900 ft. long and outlet to the English Lake Road ditch.

In addition, a Water and Sediment Control Basin (WASCB) should be constructed south of the PWA identified on Map 2 by a blue X. This would intercept 3.3 acres of agricultural land storm water runoff from discharging into the lake. A tile would be installed with the WASCB to carry the water north-west to the English Lake Road ditch. A total of 14.8 acres of storm water runoff from cropland would no longer reach the lake. The water that would be redirected away from the lake and outlet at the English Lake Rd ditch would filter through approximately 450 yards of grass channel until it reaches Silver Creek.

Another solution to eliminate storm water runoff from entering the lake from Tile 1 would be to abandon the existing tile, and let the PWA become a larger ponded area. In this scenario, the landowners would need to agree to the loss of a significant amount of cropland. The current landowner has stated to us that he would like this land to remain as cropland.

Discharge from Tile 2

A four year study conducted and published by UW Discovery Farms (Madison et al., 2013) on a tile line system in a crop field with a similar management practices and same Kewaunee soil type as the crop field north of English Lake, had an average of 0.75 mg/L total phosphorus concentration in the tile water discharge.

Using 0.75 mg/L along with annual rainfall for Manitowoc County, it was estimated that 31.6 pounds of phosphorus is discharging to English Lake through Tile 2 annually. To eliminate Tile 2 from out letting into English Lake, a new tile should be installed that also directs water

north west. This 700 Ft. long tile would connect to an existing tile (black line on Map 2) that outlets west of the lake. This proposed tile is identified by a grey dotted line on Map 2.

Recommendation

The Manitowoc County Soil and Water Conservation Department recommends that these two tile systems and WASCB be installed in the field north of English Lake, eliminating a total of 26.8 acres of water from agricultural land from discharging into the lake. Diverting these two tile systems would eliminate a total of 69.6 pounds of Phosphorus from discharging into English Lake annually.

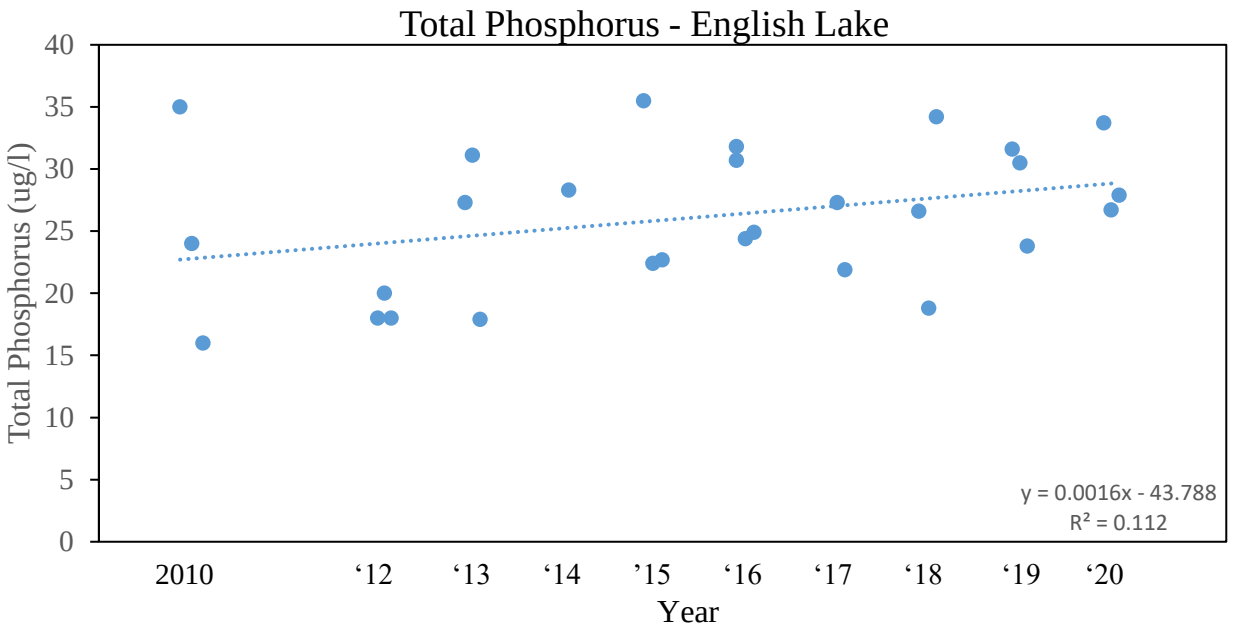
5.0 Acceptance of Plan

On July 3, 2021 a public meeting was held at the Town of Newton ~~town~~ hall to inform English Lake stakeholders about water discharge problems occurring and possible solutions. Jerry Halverson, Director of Manitowoc County Soil and Water Conservation Department, gave a presentation to approximately 40 attending stakeholders. A discussion following the presentation allowed for feedback from the stakeholders. All stakeholders in attendance were accepting and excited to get the discharge problems resolved to improve lake water quality.

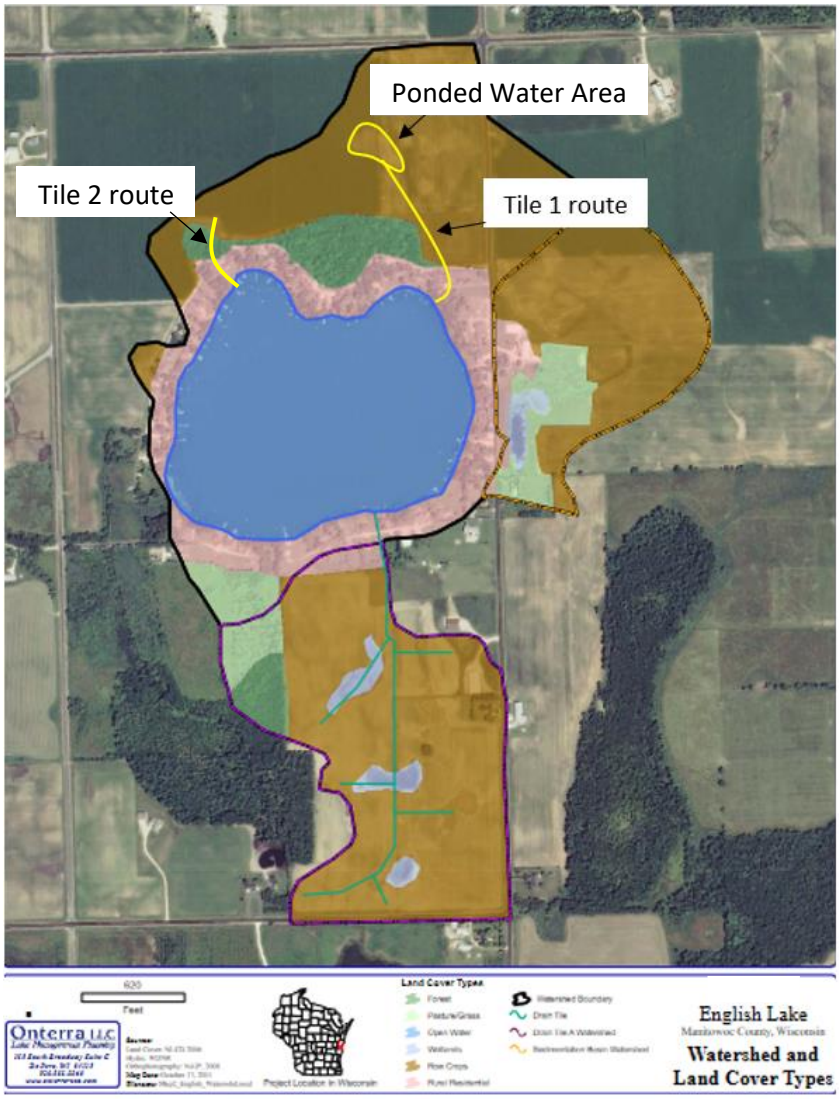
This Addendum to the 2012 English Lake Comprehensive Management Plan was accepted by the English Lake Rehabilitation and Protection District Board of Directors on August 26, 2021. The acceptance is identified in the project resolution within the DNR Surface Water Grant Application.

6.0 Works Cited

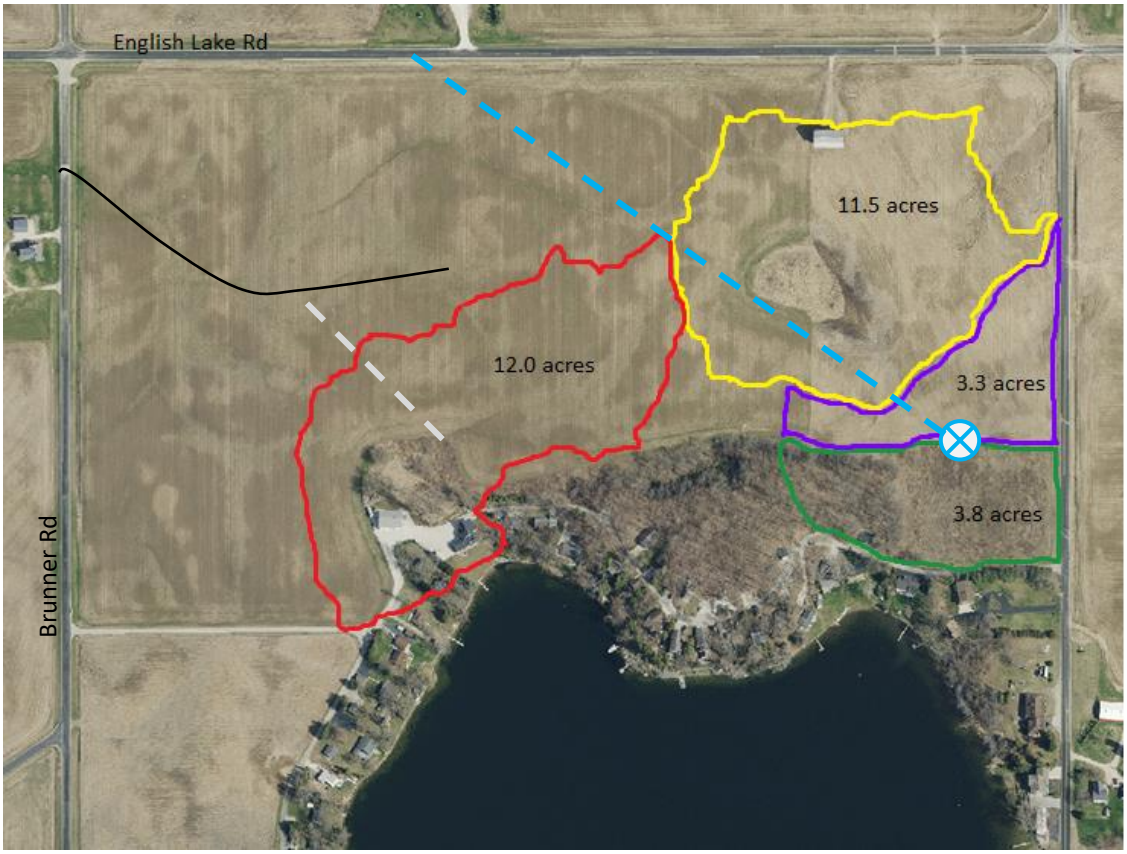
Madison, A.M., M. D. Ruark, T. D. Stuntebeck, M. J. Komiskey, L. W. Good, N. Drummy, E. T. Cooley. 2014. Characterizing phosphorus dynamics in tile-drain agricultural fields of eastern Wisconsin. *J. of Hydrology*. 519: 892-901.



Graph 1. Water test levels of Phosphorus (ug/L) during summer months (June-August).



Map 1. This is taken from English Lake's 2012 Comprehensive Management Plan written by Onterra LLC. Manitowoc County Soil and Water Conservation added the existing Tile 1, Tile 2, and Ponded Water Area locations (in yellow).



Map 2. This image shows the watersheds broken down. The most north-east watershed (yellow) includes the Ponded Water Area that Tile 1 currently drains. Tile 2 drains the watershed located in red. The blue dotted line is the proposed location of the new tile to reroute existing water going through Tile 1. The proposed WASCB would be constructed where the blue X is located. The grey dotted line is the proposed location of the new tile to reroute existing water going through Tile 2. The black solid line indicates the existing tile where the new grey tile would connect.