

WATER QUALITY TRADING PLAN

August 31, 2021
Revised December 17, 2021



Kieler Sanitary District No. 1 Wastewater Treatment Facility

WPDES Permit No. WI-0029289-08-0

3854 Kilian Lane

Kieler, Wisconsin 53812

Prepared by:

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Project Number: D18-028-1

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Attachments

- 1) Notice of Intent to Conduct Water Quality Trading
- 2) Water Quality Trading Checklist
- 3) Location & Topography Map
- 4) Sanitary Sewer Map
- 5) Wastewater Treatment Facility Flow Schematic
- 6) HUC-12 Watershed Map
- 7) Wetland Map
- 8) Soils Map and Testing Data
- 9) Current State of Eroding Streambanks Documentation
- 10) NRCS Streambank Erosion Estimator Report
- 11) Operation and Maintenance (O&M) Plan
- 12) WQT Plans and Specifications

I. Executive Summary -

This Water Quality Trading Plan summarizes the Kieler Sanitary District No. 1's (District) plan to utilize Water Quality Trading (WQT) for compliance with the final total phosphorus limit as provided in the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI 0029289-08-0. The Wastewater Treatment Facility (WWTF) treated 0.083 MGD in 2019 and 0.080 MGD in 2020. The WWTF had an average effluent Total Phosphorus (TP) concentration of 3.33 mg/L in 2020. The WWTF plans to provide chemical Phosphorus treatment and offset 128 lbs. of TP with WQT Credits in order to meet the final annual six-month average limit of 0.075 mg/L and a monthly average limit of 0.225 mg/L, which will become effective July 1, 2025.

NRCS Streambank Erosion modeling methods were used to calculate the total phosphorus credits that would be generated based on the installation of best management practices (BMPs). These credits will be used to demonstrate compliance with the final total phosphorus limit as proposed in the WPDES Permit.

As demonstrated in modeling results from Table 1.1, the WWTF has the ability to register approximately 241 credits. The implementation of this WQT Plan will result in compliance with the final TP limits. The WWTF intends to monitor TP credit usage and intends to perform construction of additional BMPs as needed for future effluent TP to comply with WPDES Permits Limits. A new Water Quality Trading Plan will be submitted at that time for new BMP practices and credit production.

Table 1.1 – Modeling Results

| Reach | Lateral Recession Rate (ft/yr.) | Current Phosphorus Loading (lbs./yr.) | Proposed Phosphorus Loading (lbs./yr.) | Proposed Phosphorus Reductions (lbs./yr.) | Trade Ratio | Proposed Phosphorus Credits |
|--------------|----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|------------------------|--------------------------------------------|
| 1 (Right) | 0.50 | 190 | 0 | 190 | 3.8:1 | 50 |
| 1 (Left) | 0.50 | 221 | 0 | 221 | 3.8:1 | 58 |
| 2 (Right) | 0.50 | 227 | 0 | 227 | 3.8:1 | 60 |
| 2 (Left) | 0.50 | 277 | 0 | 277 | 3.8:1 | 73 |
| Total | | | | | | 241 |

NOTE:

Trade Ratio = (Delivery + Downstream + Equivalency + Uncertainty – Habitat Adjustment):1

Delivery = 0 (Trading within same HUC-12 Watershed)

Downstream = 0 (For trades upstream of Outfall 001)

Downstream = 0.8 (For trades downstream of Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty: *Streambank Stabilization without Habitat Restoration* = 3

II. Background -

The purpose of this Water Quality Trading Plan (Plan) is to describe the District's use of Water Quality Trading to comply with the total phosphorus limits as provided in the District's WPDES Permit #WI-0029289-08-0. The Plan was developed following the Notice of Intent to Conduct Water Quality Trading, provided in Attachment #1, dated December 10, 2020. The Water Quality Trading Checklist Form 3400-208 is provided in Attachment #2.

The Kieler Sanitary District No. 1 (District) is located along United States Highway (U.S.H.) '61'/'151' in southern Grant County in southwest Wisconsin. The District owns and operates a Wastewater Treatment Facility (WWTF) which serves a population of approximately 261 residents.

The District is comprised primarily of commercial and residential development with one (1) industrial user. The district is situated on rolling hills with the grade typically sloping between 5% and 15%. The topography of the area is shown in Attachment #3.

The existing sanitary sewer collection consists of approximately 160 sanitary manholes, 24,700' of eight-inch (8") gravity sanitary sewer and 9,845' of sanitary force main. The original six-inch (6") cast iron sanitary force main (4,340') was installed in 1966. The six-inch (6") DR 18 PVC was installed in 1993 (3,340') and 2008 (2,175'). Two (2) sanitary sewer lift stations are utilized throughout the collection system to assist with the transport of wastewater to the WWTF. Please refer to Attachment #4 – Sanitary Sewer Map for location of sanitary sewer collection system components.

The Kieler Sanitary District No. 1 owns and operates a WWTF that utilizes an extended-aeration activated sludge system. Wastewater enters the WWTF by first passing through the headworks, which consists of a slope screen, bypass bar screen, and Parshall flume. Wastewater then proceeds to the extended-aeration activated sludge system. Activated sludge is settled out in the central final clarifier. Effluent is chlorinated/dechlorinated seasonally prior to discharge to the Sinnipee Creek. Activated sludge is either returned to the head of the process for further treatment or wasted to anaerobic sludge holding tanks, where it is digested and stored prior to land application on DNR approved sites. Currently, no processes or chemicals are used at the WWTF for the removal of Phosphorus. The current WWTF treats 0.080 MGD on an annual average with a design flow of 0.0914 MGD. Please see Attachment #5 for the WWTF flow schematic. The Kieler Sanitary District No. 1's WWTF has one (1) receiving water and effluent discharge location, Outfall 001: Sinnipee Creek (Platte River Watershed, GP02 – Grant-Platte River Basin).

The monthly average influent and effluent flows and loadings at the WWTF for 2019/2020 are provided in Table 2.1 and Table 2.2.

Table 2.1 – 2019 Monthly Averages

| Month | Flow | BOD ₅ | | Suspended Solids | | Total Phosphorus | | Total Phosphorus |
|-------------------------|--------------|------------------|-----------|------------------|-----------|------------------|-------------|------------------|
| | (MGD) | (mg/L) | | (mg/L) | | (mg/L) | | (lbs./day) |
| | Effluent | Influent | Effluent | Influent | Effluent | Influent | Effluent | Effluent |
| Jan. ('19) | 0.065 | 95 | 18 | 108 | 12 | - | 3.45 | 1.87 |
| Feb. ('19) | 0.075 | 64 | 13 | 87 | 8 | - | 2.54 | 1.59 |
| Mar. ('19) | 0.083 | 68 | 10 | 95 | 6 | - | 2.40 | 1.66 |
| Apr. ('19) | 0.071 | 235 | 22 | 237 | 9 | - | 3.63 | 2.15 |
| May ('19) | 0.081 | 111 | 6 | 149 | 8 | - | 6.49 | 4.38 |
| June ('19) | 0.076 | 168 | 12 | 198 | 11 | - | 6.96 | 4.41 |
| July ('19) | 0.078 | 111 | 16 | 143 | 8 | - | 3.24 | 2.11 |
| Aug. ('19) | 0.065 | 121 | 13 | 152 | 12 | - | 5.11 | 2.77 |
| Sept. ('19) | 0.116 | 127 | 9 | 161 | 10 | - | 2.19 | 2.12 |
| Oct. ('19) | 0.130 | 66 | 11 | 29 | 10 | - | 2.55 | 2.76 |
| Nov. ('19) | 0.083 | 97 | 9 | 146 | 11 | - | 2.71 | 1.88 |
| Dec. ('19) | 0.073 | 125 | 11 | 143 | 11 | - | 2.54 | 1.55 |
| Annual Average = | 0.083 | 116 | 13 | 137 | 10 | - | 3.65 | 2.44 |

Table 2.2 – 2020 Monthly Averages

| | Flow | BOD ₅ | | Suspended Solids | | Total Phosphorus | | Total Phosphorus |
|-------------------------|--------------|------------------|-----------|------------------|-----------|------------------|-------------|------------------|
| | (MGD) | (mg/L) | | (mg/L) | | (mg/L) | | (lbs./day) |
| | Effluent | Influent | Effluent | Influent | Effluent | Influent | Effluent | Effluent |
| Jan. ('20) | 0.061 | 131 | 16 | 114 | 12 | - | 4.47 | 2.27 |
| Feb. ('20) | 0.063 | 135 | 19 | 148 | 11 | - | 3.05 | 1.60 |
| Mar. ('20) | 0.096 | 90 | 14 | 122 | 11 | - | 2.06 | 1.65 |
| Apr. ('20) | 0.078 | 121 | 16 | 100 | 6 | - | 3.60 | 2.34 |
| May ('20) | 0.072 | 169 | 12 | 130 | 11 | - | 3.71 | 2.23 |
| June ('20) | 0.114 | 162 | 13 | 123 | 10 | - | 2.37 | 2.25 |
| July ('20) | 0.099 | 124 | 16 | 129 | 13 | - | 3.83 | 3.16 |
| Aug. ('20) | 0.078 | 112 | 16 | 148 | 8 | - | 3.51 | 2.28 |
| Sept. ('20) | 0.080 | 95 | 13 | 130 | 7 | - | 2.45 | 1.63 |
| Oct. ('20) | 0.066 | 105 | 19 | 152 | 11 | - | 1.47 | 0.81 |
| Nov. ('20) | 0.063 | 132 | 19 | 156 | 15 | - | 4.17 | 2.19 |
| Dec. ('20) | 0.056 | 203 | 47 | 173 | 26 | - | 5.26 | 2.46 |
| Annual Average = | 0.080 | 132 | 18 | 135 | 12 | - | 3.33 | 2.07 |

To reduce effluent TP, the District has made efforts to optimize TP reduction at the WWTF. The District has also implemented source reduction measures such as investigating potential TP

contributors. The District has checked with the following businesses for Phosphorus contribution and will continue its investigation of Phosphorus contributors:

1. Len's Paint'n Place
2. Gooch's Green House Tavern
3. PJ's Pub & Hall
4. Kieler Mall
5. Clare Bank
6. Grant County Truck Bodies
7. Casey's Gas Station
8. Kieler Service Center
9. Midwest Motor Sports
10. PSSI Chemical

During the initial evaluation of sanitary dischargers, it was determined that the businesses were not major contributors of Phosphorus. Currently, the District has been able to maintain an average Total Phosphorus effluent of 3.33 mg/L which is well within the WPDES interim limit of 6.7 mg/L. The District will continue to investigate options for TP removal at the WWTF.

Additionally, the District has investigated watershed compliance alternatives such as Water Quality Trading (WQT) and Adaptive Management (AM). Stream monitoring in 2001 confirmed that the Sinnipee Creek was an impaired water due to TP. The background TP concentration is monitored from Station #223340 Kieler Creek in Grant County. As calculated in the Water Quality Based Effluent Limit (WQBEL) on February 17, 2016, the rolling median TP concentration was 0.101 mg/L. The median average was almost double the applicable Water Quality Standard (WQS) of 0.075 mg/L. In 2016, the Sinnipee Creek was determined to have a degraded biological community. Following discussion with the County and initial investigation, the District elected to move forward with WQT. Utilizing the results from PRESTO, the watershed of the WWTF has a nonpoint source ratio of 97:3 at the point of discharge and is considered to be point-source dominated. Therefore, the District intends to perform WQT projects downstream of the outfall but within the District's Hydrological Unit Code – 12 (HUC-12) watershed #070600030708 as provided in Attachment #6.

Flow and loading data from 2020 was utilized to determine credits needed. Annual effluent TP was estimated at 810 lbs. The final limit would allow annual discharge of 18 lbs. The District would be required to offset at least 792 lbs. of effluent TP. Calculations for required WQT reductions are provided below.

1) The current annual Phosphorus loading discharged at the WWTF is calculated as follows:

$$\begin{aligned} \text{Seasonal Average Daily Flow (Q)} &= 0.080 \text{ MGD} \\ \text{Average Phosphorus concentration} &= 3.33 \text{ mg/L} \end{aligned}$$

$$3.33 \text{ mg/L} \times 0.080 \text{ MGD} \times 8.34 \times 365 \text{ days/yr.} = 810 \text{ lbs./yr.}$$

2) The proposed allowable annual Phosphorus mass limit at the WWTF is calculated as follows:

$$\begin{aligned} \text{Seasonal Average Daily Flow (Q)} &= 0.080 \text{ MGD} \\ \text{Proposed Seasonal Phosphorus Concentration Limit} &= 0.075 \text{ mg/L} \end{aligned}$$

$$0.075 \text{ mg/L} \times 0.080 \text{ MGD} \times 8.34 \times 365 \text{ days/yr.} = 18 \text{ lbs./yr.}$$

3) Reduction of Total Phosphorus required at WWTF -
810 lbs./yr. – 18 lbs./yr. = 792 lbs./yr.

However, the District intends to add chemical to treat effluent TP to 0.6 mg/L. The expected required offset is as follows:

$$(0.6 - 0.075) \text{ mg/L} \times 0.080 \text{ MGD} \times 8.34 \times 365 \text{ days/yr} = \mathbf{128 \text{ lbs/yr}}$$

To generate the required 128 TP credits, the District intends to perform streambank stabilization.

III. Location and Description of Credit Generation Sites –

The District discharges to the Sinnipee Creek (Platte River Watershed, GP02 – Grant-Platte River Basin) at Outfall 001. As mentioned previously, the District intends to perform WQT projects within the Village’s HUC-12 #070600030708. The District plans to perform streambank stabilization which will utilize grading and/or riprap to prevent the erosion of sediment from the streambanks. Projects will occur on private property. Streambank stabilization will not only prevent sediment from entering the stream, but will also prevent phosphorus, nitrogen, and other pollutants from discharging to the Sinnipee Creek. See Figure 3.1 for additional project location information.



Figure 3.1 – Project location in relation to Outfall 001

IV. Methods for Nonpoint Source Load Reduction –

The District would like to acquire 241 WQT trading credits for a safety factor in the event that effluent credits are lost or the WWTF discharges additional mass of TP. The Plan identifies trading practices that will reduce TP runoff by more than 915 lbs. and will utilize a 3.1:1 trade ratio for downstream trades. Downstream trade ratios were determined by Table 4.1 as provided by the Wisconsin DNR.

Table 4.1 – Downstream Trading Factor

| Credit User's Load as a Percentage of Total In-Stream Load | Downstream Trading Factor |
|------------------------------------------------------------|---------------------------|
| <25% | 0.1 |
| <50% | 0.2 |
| <75% | 0.4 |
| ≥75% | 0.8 |

$$\text{Load Percentage} = \frac{((Q_e \times C_e) / (Q_e \times C_e + Q_s \times C_s)) \times 100}{100\% > 75\%}$$

Downstream Trading Factor = 0.8

- Qs = Receiving water flow (7Q2) = 0 cfs
- Qe = Design Flow = 0.091 MGD = 0.14 cfs
- Cs = Background concentration of TP = 0.101 mg/L
- Ce = Effluent concentration of TP = 3.33 mg/L

The WQT practices identified for this Water Quality Trading Plan has the ability to generate approximately 241 TP credits/year indefinitely as long as trading practices are maintained.

A. Methods Used to Generate Load Reductions

For streambank stabilization, the District has the ability to generate TP load reductions through streambank grading and/or riprapping of approximately 2,457 lineal feet of streambank.

Streambank Stabilization will be performed as per NR 328 *Shore Erosion Control Structures in Navigable Waterways* and NRCS 580 *Streambank and Shoreline Protection*. Streambank shaping and riprapping will eliminate the discharge of sediment to the stream. The streambank stabilization project will occur within HUC-12 #070600030708 in order to generate TP credits. Standard Plans and Specifications for the Project Site will be provided by a Professional Engineer. The District will also acquire all required permits and authorizations for the Projects.

To register credits, the District has entered into trade agreements with Property Owners pursuant to *s. 283.84(1)(b), Wis. Stats.*

B. History of Project Site

The Project Site is planned within the Platte River Watershed along the Sinnipee Creek. No mapped wetlands will be impacted by the WQT Project as indicated in Attachment #7 – Wetland Maps.

The project location is planned on private property along Sinnipee Creek. Land use consists of cattle pasture and the vegetative cover is primarily grass with a few scattered trees.

The streambanks have experienced significant erosion as the Sinnipee Creek has been cleared for agricultural use. The banks are bare with slumps, rills and sever vegetative overhang throughout. Severe erosion indicators such as undercuts, slumps, tree roots, and fallen trees are readily visible throughout the site. The erosion indicators demonstrate the lateral recession rate is Severe (0.3-0.5 ft/yr) based on the NRCS Recession Rate Table.

C. Model Used to Derive Load Reductions

NRCS Streambank Erosion modeling methods were used to calculate the total phosphorus credits that would be generated based on the installation of BMPs. These credits will be used to demonstrate compliance with the final total phosphorus limit as proposed in the WPDES Permit. Modeling results are provided in Table 4.2. If the Plan or model inputs change during construction, the District will submit to the DNR the revised models and calculations to more accurately reflect and number of credits generated.

Table 4.2 – Modeling Results

| Reach | Lateral Recession Rate (ft/yr.) | Current Phosphorus Loading (lbs./yr.) | Proposed Phosphorus Loading (lbs./yr.) | Proposed Phosphorus Reductions (lbs./yr.) | Trade Ratio | Proposed Phosphorus Credits |
|--------------|---------------------------------|---------------------------------------|----------------------------------------|-------------------------------------------|-------------|-----------------------------|
| 1 (Right) | 0.50 | 190 | 0 | 190 | 3.8:1 | 50 |
| 1 (Left) | 0.50 | 221 | 0 | 221 | 3.8:1 | 58 |
| 2 (Right) | 0.50 | 227 | 0 | 227 | 3.8:1 | 60 |
| 2 (Left) | 0.50 | 277 | 0 | 277 | 3.8:1 | 73 |
| Total | | | | | | 241 |

NOTE:

- Trade Ratio** = (Delivery + Downstream + Equivalency + Uncertainty – Habitat Adjustment):1
- Delivery** = 0 (Trading within same HUC-12 Watershed)
- Downstream** = 0 (For trades upstream of Outfall 001)
- Downstream** = 0.8 (For trades downstream of Outfall 001)
- Equivalency** = 0 (Not necessary of Total Phosphorus)
- Uncertainty:** *Streambank Stabilization without Habitat Restoration* = 3

Soil testing has been completed to determine TP concentrations within the soil. Soil sampling was performed approximately every 100 feet and included the use of a soil sampler which pulled 3/4" cores at 8" depth. Approximately six (6) cores were taken at each sampling location to provide a representative sample. Soils maps and soil testing data is provided in Attachment #8. An onsite evaluation has been conducted to estimate stream bank recession rate. The data, narrative, and photos documenting the current state of eroding stream banks are provided in Attachment #9.

With the collected data, the NRCS Streambank Erosion Estimator was used to calculate TP loss from each reach of the eroding streambank. The modeling data for the NRCS Streambank Erosion Estimator is available in Attachment #10. The streambank grading and riprap design will eliminate streambank recession thus eliminating TP inputs within the Project areas.

Sinnipee Creek has experienced agricultural development within the watershed and has issues caused by sedimentation which was included in Wisconsin DNR evaluation for *Platte River Region*. The watershed has also experienced reduction of large woody debris along the streambanks due to agricultural development which reduces available habitat and bank roughness. Streambank improvements will reduce sediment which was identified as the #1 reason for habitat degradation in the Sinnipee Creek.

D. Operation and Maintenance

An Operation and Maintenance (O&M) Plan is provided in Attachment #11. The O&M plan describes how the Stream Stabilization Practices will be operated and maintained. The O&M Plan also addresses response procedures for Practice Registration, Noncompliance Notification, and Notification of Trade Agreement Termination.

As previously mentioned, the District is planning to perform streambank stabilization by implementing BMPs along the Sinnipee Creek streambanks. The stabilization practices will be installed and maintained per the Plans and Specifications as provided in Attachment #12. BMPs are to follow NR 328 Shore Erosion Control Structures in Navigable Waterways and NRCS 580 Streambank and Shoreline Protection. Restoration landscaping and seeding will be installed following construction and will be closely monitored for a minimum of two (2) growing seasons to ensure the new seeding grows and erosion is not prevalent. Weeds and invasive vegetation growth will be addressed if present. The riprap will be inspected following heavy rain events at a minimum. Inspection will be used to determine appropriate actions in order to maintain the riprap for continuous and ongoing streambank stabilization and TP credit generation.

The BMPs will be inspected annually by a licensed Professional Engineer to ensure that the BMPs are functioning as intended in order to meet the requirements of this WQT Plan.

V. Trade Timeline –

Schedule for Installation of the above mentioned trading practices for Total Phosphorus Credit Generation for TP compliance is provided in Table 5.1 below.

Table 5.1 – Trade Timeline

| Item | Completion Timeline |
|--------------------------------------------------------------|----------------------------|
| Site Investigation | Spring 2021 |
| Conceptual Design | Summer 2021 |
| Final Design | Fall 2021 |
| Construction Permits | Spring 2022 |
| DNR Review of Final Design | Spring 2022 |
| Construction of BMPs | Fall 2022 – Spring 2023 |
| Phosphorus Credit Registration | Spring 2023 |
| Use of Phosphorus Credits (Ongoing for Permit Compliance) | June 1, 2023 |

Credits will be used by the District beginning June 1, 2023. Credits will continue as long as the trading practices are maintained as outlined in this WQT Plan.

VI. Inspection Reporting –

A. Tracking Procedures

The District will track credits used monthly. The District will report credit usage to the DNR on a monthly basis in the Discharge Monitoring Reports (DMRs). The annual report will summarize the 12 months of credit usage and credit generation. The District will report to DNR any concern that they have that may result in a need to modify the trade agreement and/or this trade plan. For example, a need to generate additional credits based on discharge.

B. Inspection

Inspection of the BMPs shall occur during construction phase to ensure they are installed per the design and meet all applicable codes and permits. Once completed, inspections of the established BMPs shall occur each month at a minimum or following heavy rain events. A licensed professional engineer will perform an annual certification to ensure the practice is performing as designed and the District remains in compliance.

The inspection reports will include:

- i. Name and contact information of the inspector
- ii. Inspection Date
- iii. Relevant standards set forth in the Design Plan or Operation and Maintenance Plan
- iv. Issues identified
- v. When and how any issues identified were addressed
- vi. When and how any issues identified will be addressed in the future

Inspection reports generated during each routine or after rain event inspection will be included with the Annual Water Quality Trading Report submitted by the District to DNR. Annual inspections by a professional engineer will typically occur in April or May. This time of year is ideal for evaluating the condition of BMPs as it follows the freeze/thaw which poses the greatest potential for changes to the BMPs. Minimal vegetation cover will allow for adequate visual inspection.

C. Management Practice Registration Form

The District will file a completed registration form 3400-207 for Water Quality Trading Management Practice Registration separately from this Plan.

D. Annual Water Quality Trading Report Submittal

The following shall be submitted to the DNR by January 31 of each year:

- i. The number of pollutant reduction credits (lbs./month) used each month of the previous year to demonstrate compliance;
- ii. A summary of the annual inspection of the practice that generated any of the pollutant reduction credits used during the previous year, this inspection shall be completed by a licensed Professional Engineer;
- iii. All monthly inspection reports;

- iv. Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports;
- v. A list of all noncompliance and the correction measures and timing to address the issues throughout the year; and
- vi. An updated WQT plan if management practices have or will change.

E. Monthly Certification of Management Practices

Each month, the District will certify that the BMPs are maintained and operating in a manner consistent with this Water Quality Trading Plan or provide a statement noting noncompliance with this Plan. The monthly Discharge Monitoring Report (DMR) will include the following statement as a certification of compliance when the Credit Generating Practice is operating in a manner consistent with the Plan:

“I certify that to the best of my knowledge that the management practices identified in the approved water quality trading plan as the source of phosphorus credits is installed, established and properly maintained.”

F. Notification of Failure to Generate Credits

The District will notify DNR by telephone call to DNR’s regional wastewater compliance engineer within 24 hours or next business day of becoming aware that phosphorus credits used or intended for use by District are not being generated as outlined in this Water Quality Trading Plan.

The District will submit a written notification within five days after the District recognizes that the phosphorus credits are not being generated as outlined in the Trading Plan. DNR may waive the requirement for submittal for a written notice within five days and instruct the District to submit the written notice with the next regularly scheduled monitoring report required by District’s WPDES Permit.

The written notice will contain a description of how and why the TP credits are not being generated as outlined in the Water Quality Trading Plan, the steps taken or planned to prevent reoccurrence of the identified problems and the length of time anticipated it will take to address the issue.

The District will work to rectify the problem as laid out in the Operation and Maintenance Plans.

G. Conditions under which Management Practices May Be Inspected

Any DNR authorized officer, employee, or representative has the right to access and inspect the credit generating practice so long as the District’s trade agreement with the property owner(s) and this Water Quality Trading Plan remain in effect.

VII. Certification –

The undersigned hereby certifies that this Water Quality Trading Plan is accurate and correct to the best of his knowledge.

Kieler Sanitary District No. 1 Wastewater Treatment Facility

By: Faber Runde

Faber Runde
District President
Kieler Sanitary District No. 1
2135 Elm Street
P.O. Box 12
Kieler, WI 53812
Telephone: (608) 568-3232
Email: kielersd1@tds.net

Attachment #1

Notice: Pursuant to s. 283.84, Wis. Stats., and ch. NR 217 Wis. Adm. Code, this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

| Applicant Information | | | | |
|--------------------------------------------------------------------|--|-----------------------------------------------|-------------------|---------------------------|
| Permittee Name Kieler Sanitary District No. 1 | | Permit Number WI- 0029289 | | Facility Site Number |
| Facility Address 3854 Kilian Lane | | | City Kieler | State WI |
| | | | ZIP Code 53812 | |
| Project Contact Name (if applicable) Jordan Fure (Delta 3 Eng.) | | Address 875 South Chestnut Street | | City Platteville |
| | | | | State WI |
| | | | | ZIP Code 53818 |
| Project Name Kieler SD No. 1 - Water Quality Trading | | | | |
| Receiving Water Name Sinnipee Creek | | Parameter(s) being traded Total Phosphorus | | HUC 12(s) 070600030708 |

Is the permittee in a point or nonpoint source dominated watershed? Point source dominated
 (See PRESTO results - <http://dnr.wi.gov/topic/surfacewater/presto.html>) Nonpoint source dominated

| Credit Generator Information | |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Credit generator type (select all that apply): | <input type="checkbox"/> Permitted Discharge (non-MS4/CAFO) <input type="checkbox"/> Urban nonpoint source discharge <input type="checkbox"/> Permitted MS4 <input checked="" type="checkbox"/> Agricultural nonpoint source discharge <input type="checkbox"/> Permitted CAFO <input type="checkbox"/> Other - Specify: _____ |

Are any of the credit generators in a different HUC 12 than the applicant? Yes; HUC 12: _____
 No
 Unsure

Are any of the credit generators downstream of the applicant? Yes
 No
 Unsure

Will a broker/exchange be used to facilitate trade? Yes; Name: _____
 No
 Unsure

Point to Point Trades (Traditional Municipal / Industrial Discharge, MS4, CAFO)

| Discharge Type | Permit Number | Name | Contact Address | Is the point source credit generator currently in compliance with their permit requirements? |
|----------------------------------------------------------------------------------------------|---------------|------|-----------------|----------------------------------------------------------------------------------------------|
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |

Point to Nonpoint Trades (Non-permitted Agricultural, Non-Permitted Urban, etc.)

List the practices that will be used to generate credits:

The District intends to perform streambank stabilization. The construction will occur downstream of the Outfall 001 since the Outfall is at the Headwaters of Sinnipee Creek.

Method for quantifying credits generated: Monitoring
 Modeling, Names: NRCS Streambank Erosion Estimator
 Other: _____

Projected date credits will be available: 07/01/2023

The preparer certifies all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.

Signature of Preparer

Jordan Finner

Date Signed

12/10/2020

Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative

Wade Ows

Date Signed

12-10-20

Attachment #2

Notice: Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

Applicant Information

| | | | | |
|--------------------------------------------------------------------|-----------------------------------------------|------------------------------|----------------------|-------------------|
| Permittee Name Kieler Sanitary District No. 1 | | Permit Number WI- 0029289 | Facility Site Number | |
| Facility Address 3854 Kilian Lane | | | City Kieler | State WI |
| | | | ZIP Code 53812 | |
| Project Contact Name (if applicable) Jordan Fure (Delta 3 Eng.) | Address 875 South Chestnut Street | City Platteville | State WI | ZIP Code 53818 |
| Project Name Proposed 2022 Stream Improvements - Sinnipee Creek | | | | |
| Receiving Water Name Sinnipee Creek | Parameter(s) being traded Total Phosphorus | HUC 12(s) 070600030708 | | |

Credit Generator Information

Credit generator type (select all that apply):

| | |
|------------------------------------------------------------|-----------------------------------------------------------------|
| <input type="checkbox"/> Permitted Discharge (non-MS4CAFO) | <input type="checkbox"/> Urban nonpoint source discharge |
| <input type="checkbox"/> Permitted MS4 | <input type="checkbox"/> Agricultural nonpoint source discharge |
| <input type="checkbox"/> Permitted CAFO | <input type="checkbox"/> Other - Specify: _____ |

Are any of the credit generators in a different HUC 12 than the applicant? Yes; HUC 12: _____
 No

Are any of the credit generators downstream of the applicant? Yes
 No

Will a broker/exchange be used to facilitate trade? Yes (include description and contact information in WQT plan)
 No

Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)

Are each of the point source credit generators identified in this section in compliance with their WDPES permit requirements? Yes
 No

| Discharge Type | Permit Number | Name | Contact Information | Trade Agreement Number |
|----------------------------------------------------------------------------------------------|---------------|------|---------------------|------------------------|
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | |
| <input type="radio"/> Traditional <input type="radio"/> MS4 <input type="radio"/> CAFO | | | | |

Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) cont.

| Does plan have a narrative that describes: | | Plan Section |
|---------------------------------------------------------------------------------|----------------------------------------------------|--------------|
| a. Summary of discharge and existing treatment including optimization | <input type="radio"/> Yes <input type="radio"/> No | |
| b. Amount of credit being generated | <input type="radio"/> Yes <input type="radio"/> No | |
| c. Timeline for credits and agreements | <input type="radio"/> Yes <input type="radio"/> No | |
| d. Method for quantifying credits | <input type="radio"/> Yes <input type="radio"/> No | |
| e. Tracking and verification procedures | <input type="radio"/> Yes <input type="radio"/> No | |
| f. Location of credit generator in proximity to receiving water and credit user | <input type="radio"/> Yes <input type="radio"/> No | |
| g. Other: _____ | <input type="radio"/> Yes <input type="radio"/> No | |

Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)

| Discharge Type | Practices Used to Generate Credits | Method of Quantification | Trade Agreement Number | Have the practice(s) been formally registered? |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------|------------------------|--------------------------------------------------------------------------------------------------------|
| <input type="radio"/> Urban NPS <input checked="" type="radio"/> Agricultural NPS <input type="radio"/> Other | Streambank Stabilization | NRCS Streambank Erosion Estimator | | <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Only in part |

| Does plan have a narrative that describes: | | Plan Section |
|----------------------------------------------------------------------------|---------------------------------------------------------------|--------------|
| a. Description of existing land uses | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| b. Management practices used to generate credits | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| c. Amount of credit being generated | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| d. Description of applicable trade ratio per agreement/management practice | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| e. Location where credits will be generated | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section III |
| f. Timeline for credits and agreements | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section V |
| g. Method for quantifying credits | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |

| Does plan have a narrative that describes: | | Plan Section |
|---------------------------------------------------------------------------------|---------------------------------------------------------------|--------------|
| h. Tracking procedures | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| i. Conditions under which the management practices may be inspected | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section VI |
| j. Reporting requirements should the management practice fail | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section VI |
| k. Operation and maintenance plan for each management practice | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| l. Location of credit generator in proximity to receiving water and credit user | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section III |
| m. Practice registration documents, if available | <input type="radio"/> Yes <input checked="" type="radio"/> No | |
| n. History of project site(s) | <input checked="" type="radio"/> Yes <input type="radio"/> No | Section IV |
| o. Other: _____ | <input type="radio"/> Yes <input type="radio"/> No | |

The preparer certifies all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| | |
|-------------------------------------------|------------------------|
| Signature of Preparer <i>Adam Fene</i> | Date Signed 8/31/21 |
|-------------------------------------------|------------------------|

Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| | |
|-------------------------------------------------------------|------------------------|
| Signature of Authorized Representative <i>John Kende</i> | Date Signed 8-31-21 |
|-------------------------------------------------------------|------------------------|

Attachment #3

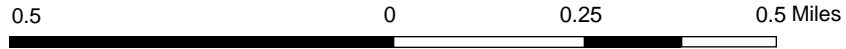


Location Map

Outfall 001
WWTF



- Legend**
- Municipality
 - State Boundaries
 - County Boundaries
 - Major Roads**
 - Interstate Highway
 - State Highway
 - US Highway
 - County and Local Roads**
 - County HWY
 - Local Road
 - Railroads
 - Tribal Lands
 - Rivers and Streams
 - Intermittent Streams
 - Lakes and Open water
 - Index to EN_Image_Basemap_Leaf_Off



NAD_1983_HARN_Wisconsin_TM

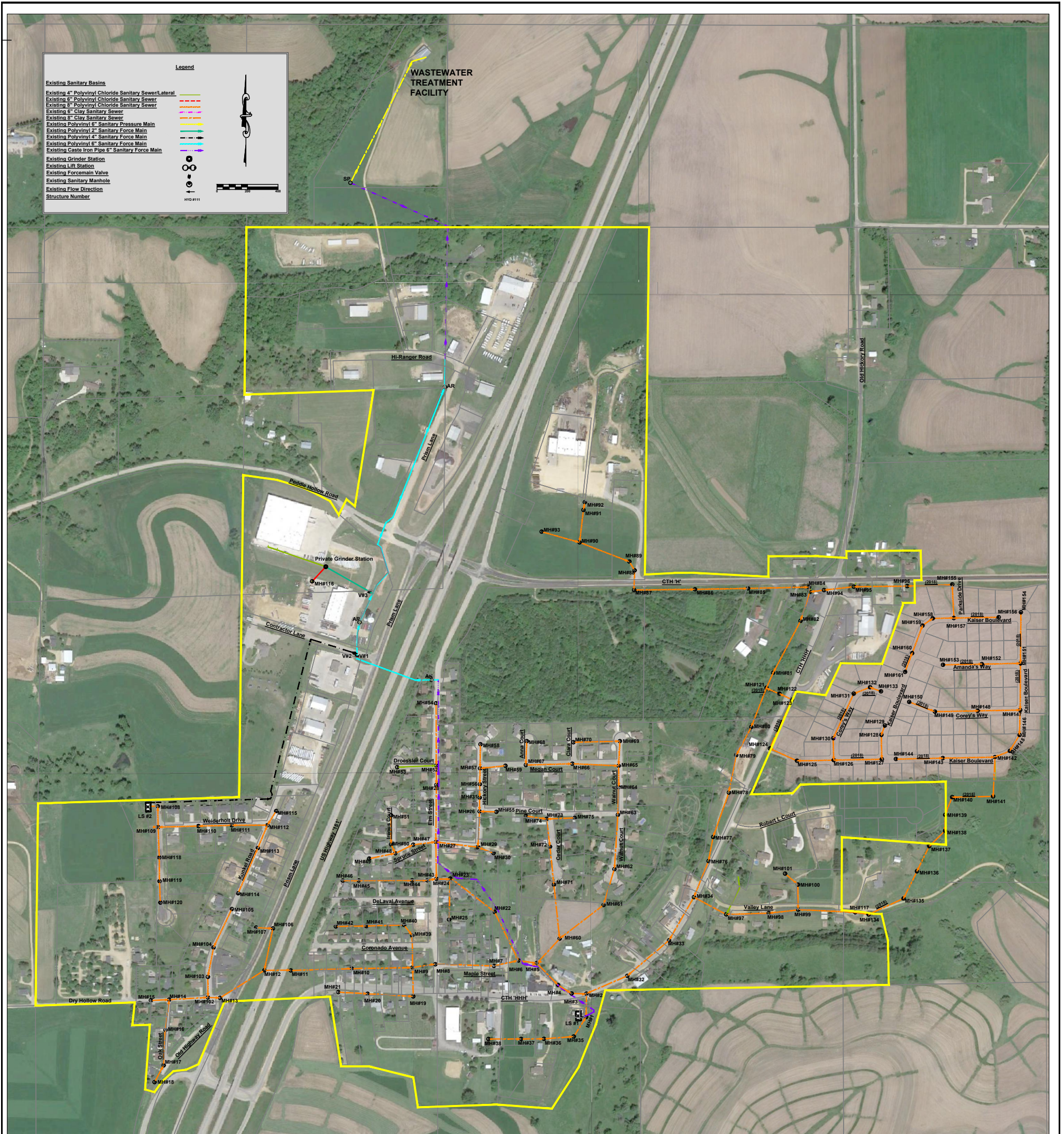
1: 15,840

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Notes

Exhibit #1

Attachment #4

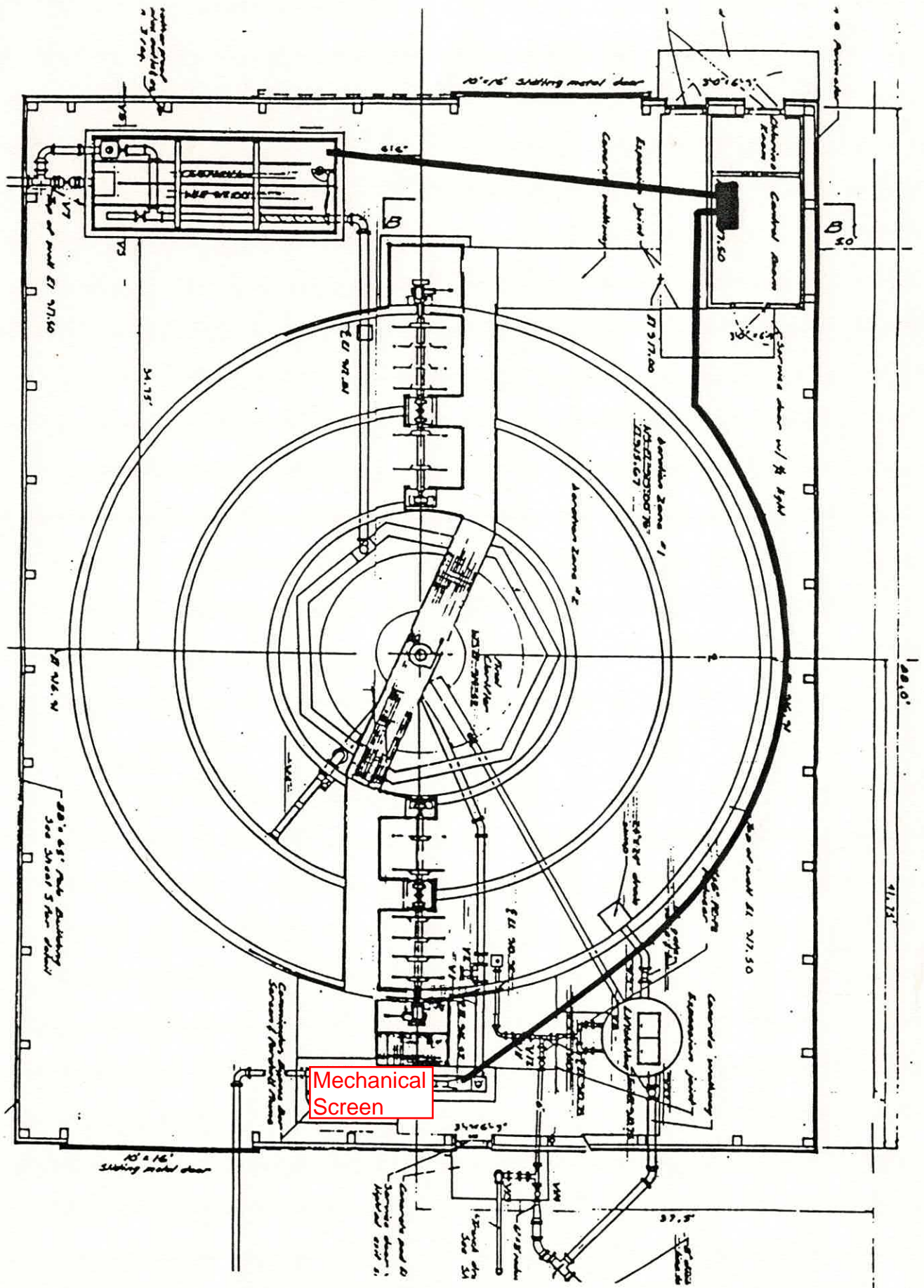


*Kieler Sanitary District—
 Sanitary Sewer System Map
 1"=600*

DELTA 3
EVERY ANGLE COVERED
 PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING • ARCHITECTURE
 GRANT WRITING • LAND DEVELOPMENT • PLANNING & CAD SERVICES
 875 SOUTH CHESTNUT STREET PHONE: (608) 348-5355
 PLATEVILLE, WISCONSIN 53818
 888 JACKSON STREET PHONE: (563) 542-9005
 DUBUQUE, IOWA 52001

Drawn by: C.Jentz
 Date: March, 2009
 Revised by: C.Coyler
 Date: May, 2021

Attachment #5



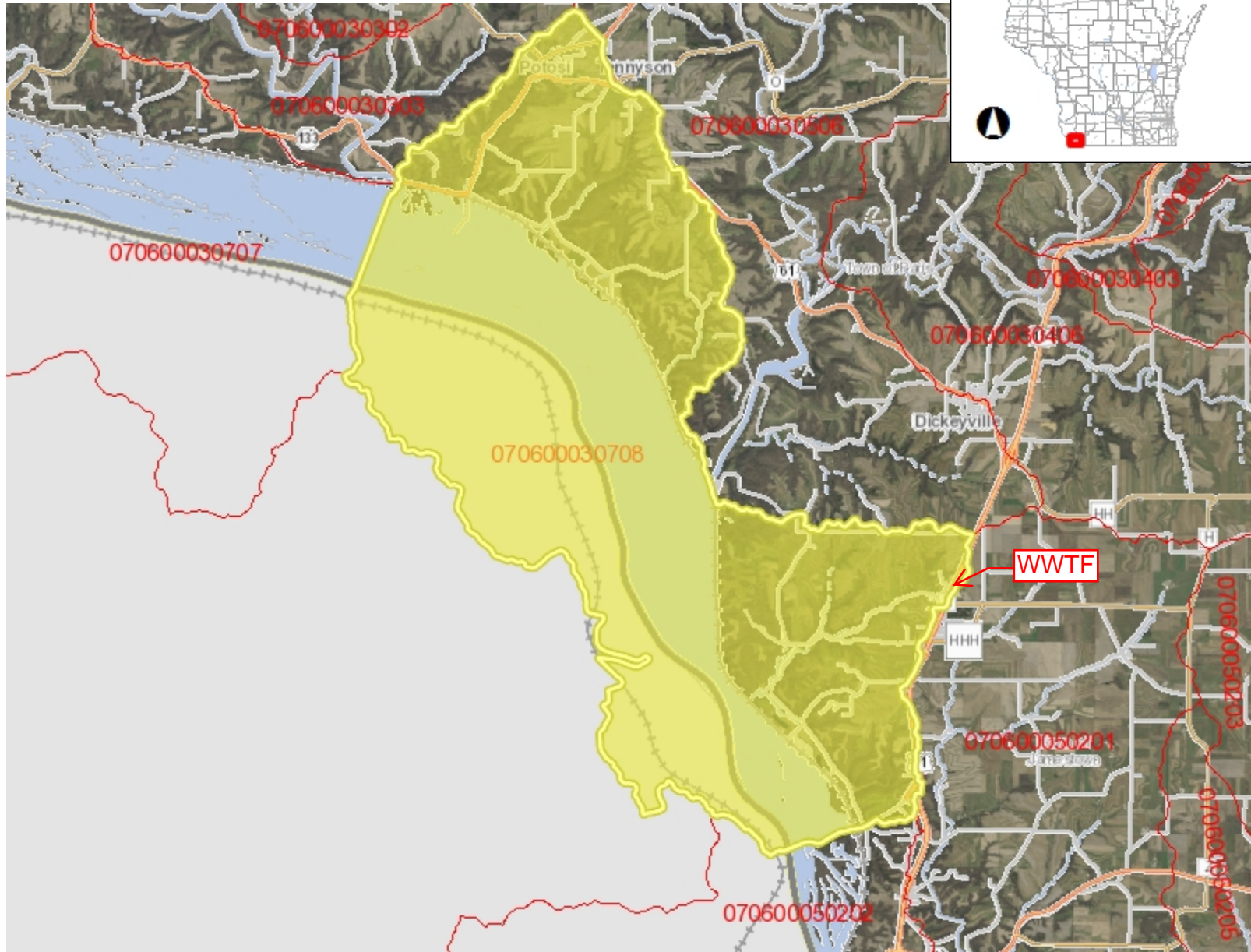
Mechanical Screen

SAMPLERS, 1/2" P.V.C. CARRIER PIPES AND 3/8" SAMPLER TUBING LOCATION

Attachment #6



HUC-12 Watershed Map



- Legend**
- 12-digit HUCs (Subwatersheds)
 - Municipality
 - State Boundaries
 - County Boundaries
 - Major Roads**
 - Interstate Highway
 - State Highway
 - US Highway
 - County and Local Roads**
 - County HWY
 - Local Road
 - Railroads
 - Tribal Lands
 - Rivers and Streams
 - Intermittent Streams
 - Lakes and Open water
 - Index to EN_Image_Basemap_Leaf_Off



NAD_1983_HARN_Wisconsin_TM

1: 126,720

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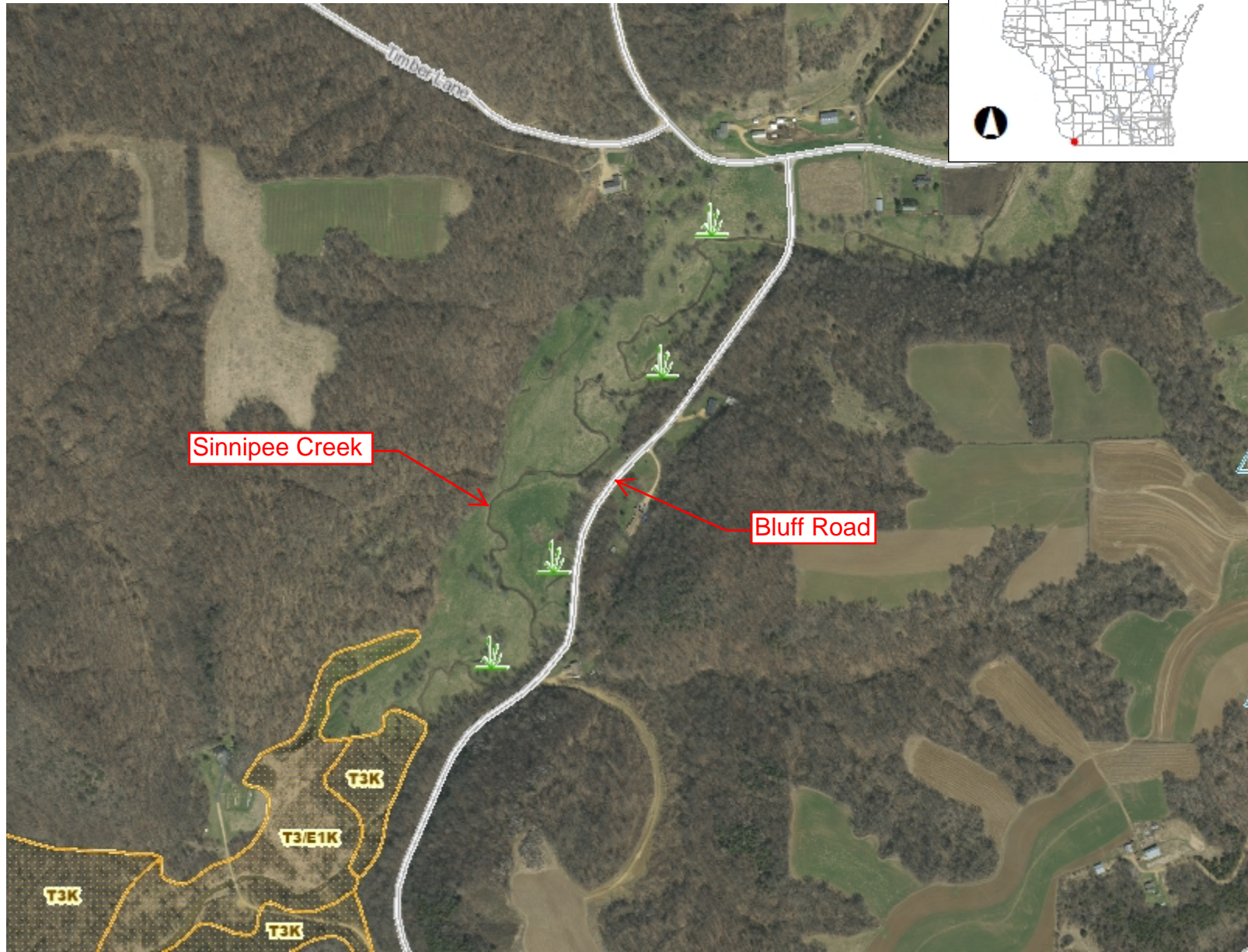
Notes

Exhibit #4

Attachment #7

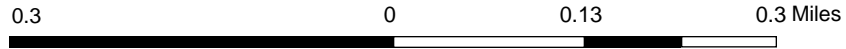


Wetland Map



Legend

- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- Municipality
- State Boundaries
- County Boundaries
- Major Roads**
 - Interstate Highway
 - State Highway
 - US Highway
- County and Local Roads**
 - County HWY
 - Local Road
- Railroads
- Tribal Lands
- Waterways



NAD_1983_HARN_Wisconsin_TM

1: 7,920

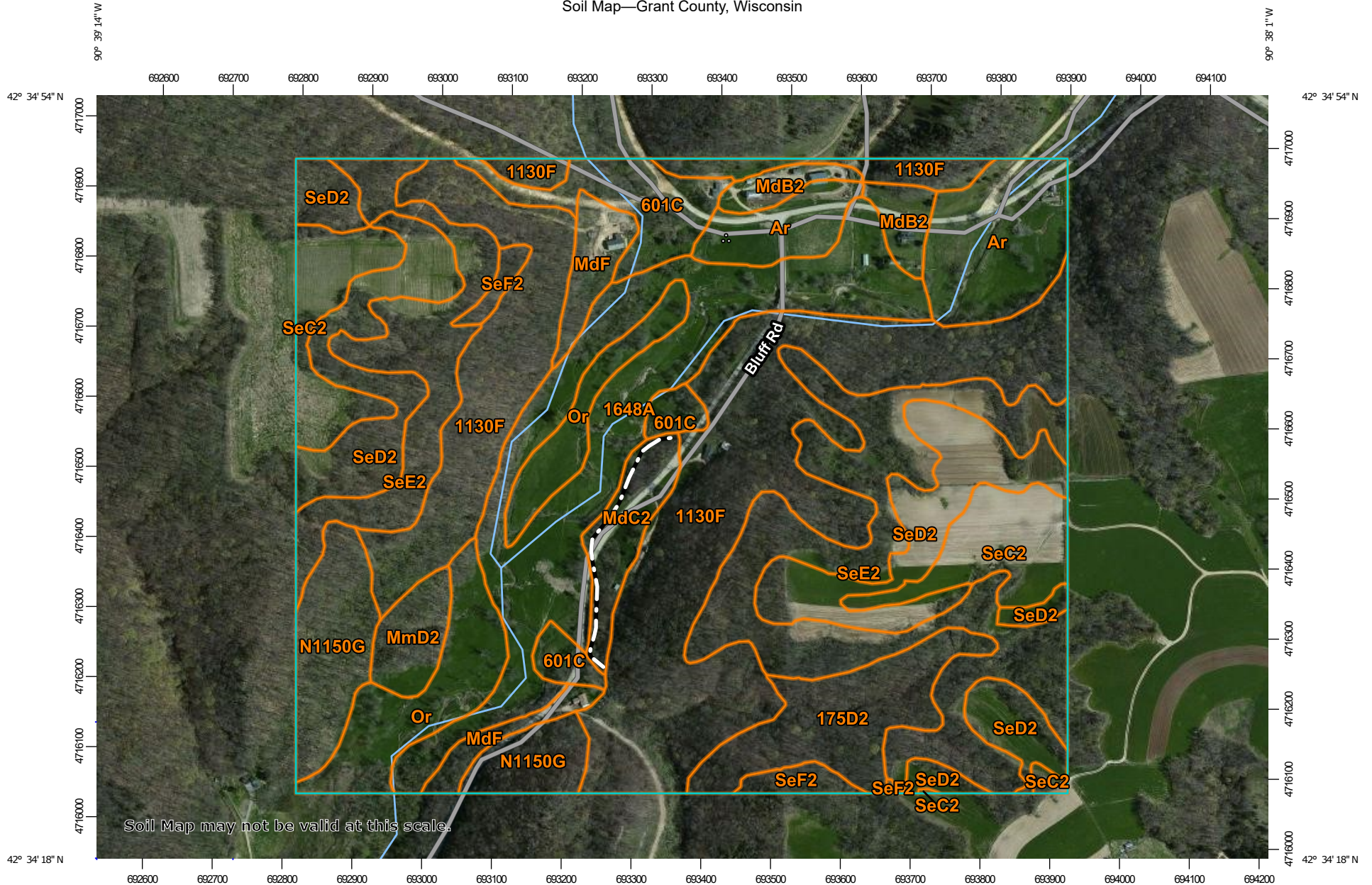
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/legal/>

Notes

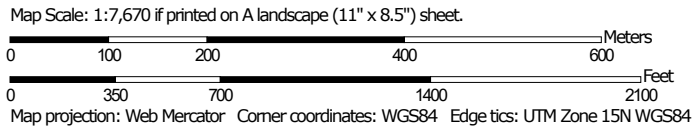
Exhibit #5

Attachment #8

Soil Map—Grant County, Wisconsin



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grant County, Wisconsin

Survey Area Data: Version 15, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 2, 2011—Aug 21, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|------------------------------------------------------------------------------------|--------------|----------------|
| 175D2 | Palsgrove silt loam, 12 to 20 percent slopes, moderately eroded | 10.5 | 4.2% |
| 601C | Beavercreek cobbly fine sandy loam, 3 to 12 percent slopes, occasionally flooded | 9.0 | 3.6% |
| 1130F | Lacrescent-Dunbarton complex, very stony, 30 to 60 percent slopes | 60.2 | 24.2% |
| 1648A | Northbend-Ettrick silt loams, 0 to 3 percent slopes, frequently flooded | 28.7 | 11.5% |
| Ar | Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded | 14.5 | 5.8% |
| MdB2 | Medary silt loam, 0 to 6 percent slopes, moderately eroded | 4.0 | 1.6% |
| MdC2 | Medary silty clay loam, 6 to 12 percent slopes, moderately eroded | 4.7 | 1.9% |
| MdF | Medary silt loam, 15 to 45 percent slopes | 5.1 | 2.1% |
| MmD2 | Meridian loam, 10 to 15 percent slopes, moderately eroded | 3.6 | 1.4% |
| N1150G | Brodale, deep-Lacrescent, very stony-Rock outcrop complex, 60 to 90 percent slopes | 11.3 | 4.5% |
| Or | Orion silt loam, 0 to 3 percent slopes, occasionally flooded | 13.2 | 5.3% |
| SeC2 | Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded | 13.6 | 5.5% |
| SeD2 | Seaton silt loam, river bluff, 10 to 18 percent slopes, moderately eroded | 27.6 | 11.1% |
| SeE2 | Seaton silt loam, river bluff, 15 to 25 percent slopes, moderately eroded | 40.0 | 16.1% |
| SeF2 | Seaton silt loam, river bluff, 18 to 35 percent slopes, moderately eroded | 2.4 | 1.0% |
| Totals for Area of Interest | | 248.5 | 100.0% |



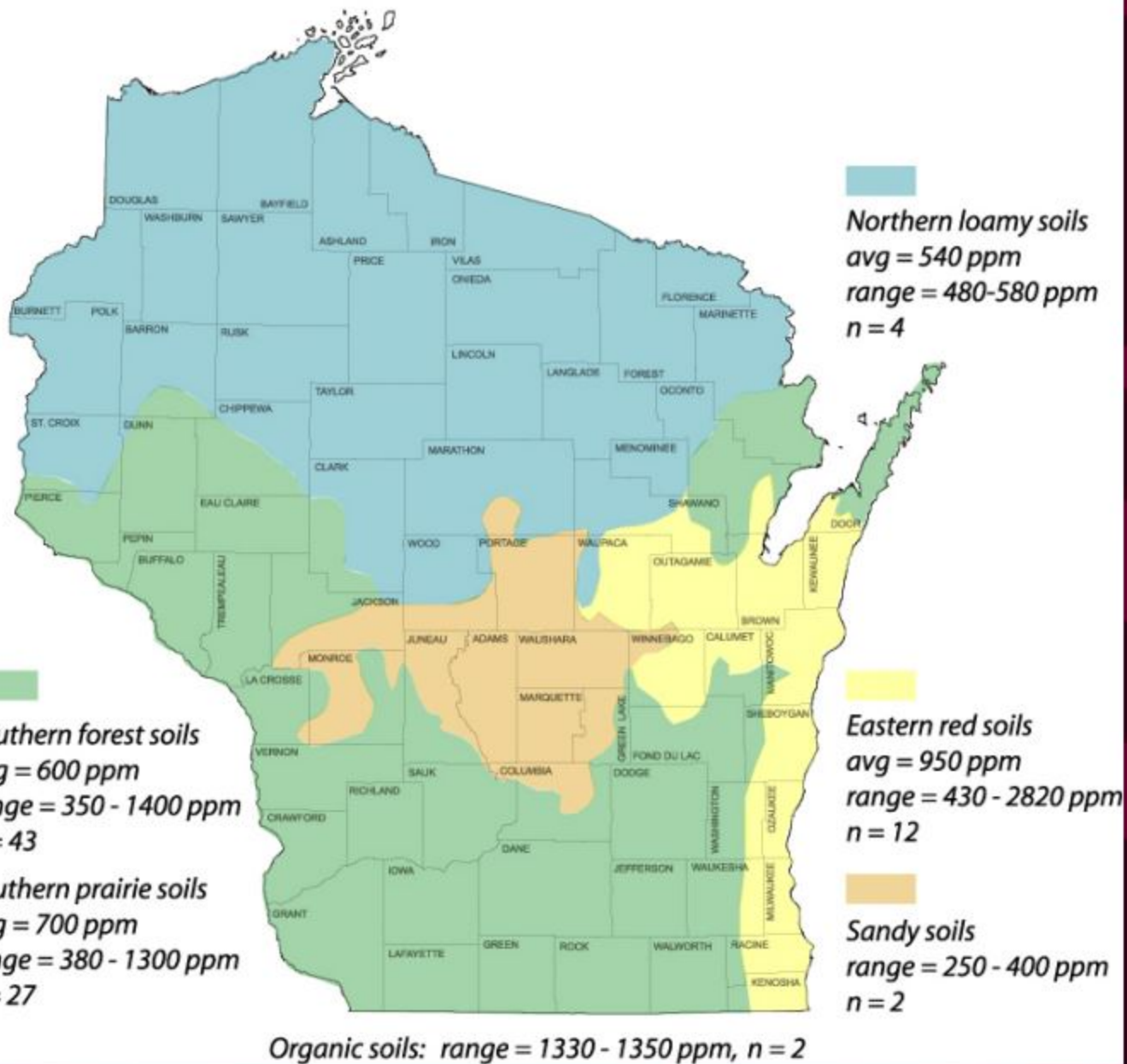
710 Commerce Drive
PO Box 169
Watertown, WI 53094

920-261-0446 phone
920-261-1365 fax
www.rockriverlab.com

Kieler Sanitary District- Total Phosphorus Analysis 06/04/2021

| Field ID | Sample ID | Total P (ppm) |
|----------|-----------|---------------|
| Kieler | 2E | 436.6 |
| Kieler | 3W | 580.8 |
| Kieler | 4E | 473 |
| Kieler | 5W | 470.1 |
| Kieler | 6E | 447.4 |
| Kieler | 7W | 497.8 |
| Kieler | 8E | 463.5 |
| Kieler | 9W | 505.4 |
| Kieler | 10E | 481.2 |
| Kieler | 11W | 348.2 |
| Kieler | 12E | 520.6 |
| Kieler | 13W | 465.6 |
| Kieler | 14E | 510.9 |
| Kieler | 15W | 548 |
| Kieler | 16E | 607.2 |
| Kieler | 17W | 458.5 |
| Kieler | 18E | 352.5 |
| Kieler | 19W | 559.8 |
| Kieler | 20E | 524.1 |
| Kieler | 21W | 425.7 |
| Kieler | 22E | 459.7 |
| Kieler | 23W | 473.4 |
| Kieler | 24E | 484.8 |
| Kieler | 25W | 570 |
| Kieler | Unkown | 507.8 |

Soil Total P



Attachment #9

ATTACHEMENT #9
TABLE OF CONTENTS

I. Introduction..... 1

II. Reach 1..... 1

III. Reach 2..... 8

I. Introduction

The lateral recession rate of the eroding bank is a critical component for the NRCS Streambank Erosion Estimator. The following documentation provides the justification for the lateral recession rates used in the NRCS Streambank Erosion Estimator. Lateral recession rate was estimated based on the photos provided, description, and on site evaluation. The following includes representative photos of the Project Extents to be stabilized through installation of Best Management Practices (BMPs).

II. Reach 1



Image 1 – Severe undercut with slump and vegetative overhang



Image 2 – Severe undercut with slump and vegetative overhang



Image 3A – Undercut with vegetative overhang and fallen trees



Image 3B – Undercut with vegetative overhang and fallen trees



Image 4 – Severe undercut with slump, exposed tree roots, and vegetative overhang



Image 5 – Severe undercut with slump and vegetative overhang



Image 6 – Severe undercut with **extreme active slump!**



Image 7 – Severe undercut with slump, vegetative overhang, and exposed tree roots



Image 8 – Severe undercut with slump, vegetative overhang, and exposed tree roots



Image 9 – Severe undercut with slump and vegetative overhang



Image 10A – Severe undercut with slump and vegetative overhang



Image 10B – Severe undercut with slump and vegetative overhang



Image 11 – Severe undercut with slump, vegetative overhang, and exposed tree roots

III. Reach 2



Image 12 – Severe undercut with slump and vegetative overhang



Image 13 – Undercut with exposed roots



Image 14A – Severe undercut with fallen trees



Image 14B – Severe undercut with exposed roots. Stream visibly flows approximately 1.5' under the hollowed out bank with grass and roots draping into the water.



Image 15 – Severe undercut with vegetative overhang



Image 16 – Severe undercut with vegetative overhang



Image 17 – Severe undercut with slump and vegetative overhang



Image 18 – Severe undercut with slump and vegetative overhang



Image 19 – Severe undercut with slump and vegetative overhang



Image 20 – Severe undercut with slump and vegetative overhang

Attachment #10

NRCS Excel Workbook Estimating 'Other' Erosion Types June 2006

Annual soil loss predictions for conservation planning purposes are made with current soil loss prediction technology (RUSLE2). RUSLE2 estimates sheet, rill and interrill erosion. Erosion that is seasonal in nature and caused by concentrated flow, however, is not predicted by RUSLE2.

This workbook provides conservation planners with simple tools and processes to help estimate the amount of erosion occurring in ephemeral gullies, classic gullies and on streambank erosion sites.

Definitions:

Rill Erosion: consists of the removal of soil by concentrated water running through little streamlets, or headcuts. Detachment in a rill occurs if the sediment in the flow is below the amount the load can transport and if the flow exceeds the soil's resistance to detachment. As detachment continues or flow increases, rills will become wider and deeper. Rills may be of any size but are usually less than four inches deep. Rills are:

- <> generally parallel on the slope, but may converge,
- <> generally of uniform spacing and dimension,
- <> generally appear at different locations on the landscape from year to year,
- <> generally shorter than ephemeral cropland gullies,
- <> usually end at a concentrated flow channel, or an area where the slope flattens and deposition occurs,
- <> are on the same portion of the slope that is used to determine the length of slope (L) for RUSLE2,
- <> many small, but conspicuous channels running in the direction of slope gradient

Rill erosion is considered in the RUSLE2 calculations.

Ephemeral Gully Erosion: Small erosion channels formed on crop fields as a result of concentrated flow of runoff water. These channels are routinely eliminated by tillage of the field but return following subsequent runoff events. Ephemeral Gullies are small enough to be eliminated (temporarily) with the use of typical farm tillage equipment and they:

- <> recur in the same area of concentrated flow each time they form,
- <> frequently form in well-defined depressions in natural drainage ways,
- <> are generally wider, deeper, and longer than the rills in the field,

Ephemeral Gullies are not calculated by the RUSLE2 program.

Gully Erosion: Permanent gullies are formed when channel development has progressed to the point where the gully is too wide and too deep to be tilled across. These channels carry large amounts of water after rains and deposit eroded material at the foot of the gully. They disfigure landscape and make the land unfit for growing crops. Gullies:

- <> may grow or enlarge from year to year by head cutting and lateral enlarging,
- <> often occur in depressions or natural drainage ways,
- <> may begin as ephemeral gullies that were left in the field untreated,
- <> may, over time, become partially stabilized by grass, weeds or woody vegetation,

Gully erosion is not calculated by the RUSLE2 program.

Streambank Erosion: The wearing away of streambanks by flowing water. The removal of soil from streambanks is typically caused by the direct action of stream flow and/or wind/wave action, typically occurring during periods of high flow. Streambank erosion:

<> is a natural process that generally increases when unprotected streambanks (e.g. no woody vegetation) are subject to the actions of flowing water and ice damage.

<> is a common occurrence on many Vermont river channels that are experiencing geomorphic adjustments

The soil loss from ephemeral gullies, gullies and streambank erosion areas can be estimated by calculating the volume of soil removed by erosion processes. The volume of soil loss can be multiplied by the typical unit weight of the soil (based on soil texture) which is eroded. Approximate soil unit weights are expressed below¹:

| Soil Texture | Estimated Dry Density lb/ft ³ |
|-----------------|------------------------------------------|
| Gravel | 110 |
| Sand | 105 |
| Loamy Sand | 100 |
| Sandy Loam | 100 |
| Fine Sandy Loam | 100 |
| Sandy Clay Loam | 90 |
| Silt Loam | 85 |
| Silty Clay Loam | 85 |
| Silty Clay | 85 |
| Clay Loam | 85 |
| Organic | 22 |

Procedure for estimating Ephemeral Soil Erosion:

The following formula will be used to calculate annual estimated ephemeral gully erosion:

$$\frac{\text{Ephemeral Gully Length} \times \text{Gully Average Width} \times \text{Gully Average Depth}}{2000} \times \text{Soil Weight (lbs/ft}^3\text{)} \times \text{Occurrences per Year} = \text{Estimated Soil Loss (Tons per Year)}$$

* Ephemeral gully erosion may reform multiple times per year, and under certain conditions it may not form in a given year. The voided volume which would be calculated after a runoff event is not necessarily representative of an annual rate, but is representative of only the specific event. This erosion can be calculated for individual storms and can be summed for a yearly estimate.

¹ Data from published soil surveys, laboratory data, and soil interpretation record are to be used where available. Parent materials, soil consistency, soil structure, pore space, soil texture, and coarse fragments all influence unit weight.

Procedure for estimating Gully Soil Erosion:

The following formula will be used to calculate annual estimated classic gully erosion:

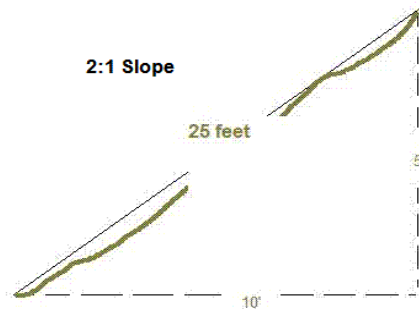
$$\frac{\text{Gully Length} \times (\text{Average Width} \times \text{Average Depth} \times 0.5) \times \text{Soil Weight (lbs/ft}^3)}{2000} \div \text{Formation Years} = \text{Estimated Soil Loss Per Year (Tons)}$$

Procedure for estimating Streambank Soil Erosion (Direct Volume Method):

The following formula will be used to calculate annual estimated streambank erosion unless a field measurement procedure² is used:

$$\frac{\text{Eroding Bank Length} \times \text{Eroding Bank Height} \times \text{Lateral Recession Rate (FT/YR)} \times \text{Soil Weight (lb)}}{2000} = \text{Estimated Soil Loss Per Year (Tons)}$$

** Eroding bank height is measured along the bank, not the vertical height of bank. Example: if vertical height of an eroding streambank is 5 feet, and the bank is on a 2:1 slope, the total eroding bank distance is 25 feet -- 1/2 (Base X Height).



***The average annual recession rate is the thickness of soil eroded from a bank surface (perpendicular to the face) in an average year.

Stream bank erosion sometimes presents itself as a major occurrence in a given year, whereas the same bank may not erode significantly for a period of years if no major runoff events occur. Recession rates need to be calculated as an average of years when erosion does and does not occur. Recession rate is not calculated as the erosion occurring after a single event.

Use available resources to assist in the estimation of recession rate: use past and present aerial photography, old survey records, and any other information that helps to determine the bank condition at known times in the past. When such information is lacking or insufficient, field observations and professional judgement are needed to estimate recession rates.

It is often not possible to directly measure recession rates in the field. Therefore, the following table has been included which relates recession rates to narrative descriptions of banks eroding at different rates (Table from NRCS Wisconsin guidance).

| Lateral Recession Rate (ft/yr) | Category | Description |
|-----------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.01-0.05 | Slight | Some bare bank but active erosion not readily apparent. Some rills but no vegetative overhang. No exposed tree roots. |
| 0.06-0.2 | Moderate | Bank is predominantly bare with some rills and vegetative overhang. Some exposed tree roots but no slumps or slips. |
| 0.3-0.5 | Severe | Bank is bare with rills and severe vegetative overhang. Many exposed tree roots and some fallen trees and slumps or slips. Some changes in cultural features such as fence corners missing and realignment of roads or trails. Channel cross section becomes U-shaped as opposed to V-shaped. |
| 0.5+ | Very Severe | Bank is bare with gullies and severe vegetative overhang. Many fallen trees, drains and culverts eroding out and changes in cultural features as above. Massive slips or washouts common. Channel cross section is U-shaped and stream course may be meandering. |

2

The best way to quantify streambank erosion is to measure it directly in the field. The basic procedure in measuring streambank erosion is to survey, flag, or in some way fix a "before" image of the channel you are evaluating in order to establish the baseline condition. Changes due to erosion can then be monitored over time by going back to the study area and re-measuring from the fixed reference points.

Channel cross-sections can be surveyed and plotted on a periodic basis to monitor change. Stakes or pins can be driven into channel banks flush with the surface. The amount of stake or pin exposed due to erosion is the amount of change at the streambank erosion site between your times of observation.

The time required to monitor a site often precludes this method of data collection. The Direct Volume Method can be used to estimate streambank erosion at your site.

Acknowledgements: This Excel workbook was created as a planning tool for use by conservation planners. The basic format and content of the tool is a compilation of various similar tools, processes and procedures employed by NRCS in several states including: Indiana, Iowa, Kansas, Maryland, Michigan, Missouri, Nebraska, Oklahoma, South Dakota and Wisconsin. Some of the terminology in the 'Definitions' section of this Readme document closely mirrors these sources.

NRCS Streambank and Irrigation Ditch Erosion Estimator (Direct Volume Method)

Farmer / Cooperator Name:
 Tract Number:

Evaluated By:
 Evaluation Date:

| <i>Field Number</i> | <i>Eroding Strmbnk Reach #; or Ditch Side/Bottom</i> | <i>Eroding Bank or Ditch Length (Feet)</i> | <i>Eroding Bank Height; or Ditch Bottom Width* (Feet)</i> | <i>Area of Eroding Strmbank or Ditch (FT²)</i> | <i>Lateral or Ditch Bottom Recession Rate (Estimated) (FT / Year)</i> | <i>Estimated Volume (FT³) Eroded Annually</i> | <i>Soil Texture</i> | <i>Approximate Pounds of Soil per FT³</i> | <i>Estimated Soil Loss (Tons/Year)</i> | <i>Soil Total Phosphorus (ppm)</i> | <i>Estimated Phosphorus Loss (Pounds/Year)</i> |
|---------------------|------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|---------------------|------------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------------------|
| Vogt Property | 1 (Right) | 2,529 | 3.7 | 9,357 | 0.50 | 4,678.7 | Silt Loam | 85 | 198.8 | 477 | 190 |
| | 1 (Left) | 2,537 | 4.3 | 10,909 | 0.50 | 5,454.6 | Silt Loam | 85 | 231.8 | 477 | 221 |
| Kunkel Property | 2 (Right) | 2,191 | 4.9 | 10,736 | 0.50 | 5,368.0 | Silt Loam | 85 | 228.1 | 498 | 227 |
| | 2 (Left) | 2,377 | 5.5 | 13,074 | 0.50 | 6,536.8 | Silt Loam | 85 | 277.8 | 498 | 277 |
| TOTAL | | | | | | 22037.9 | | | 936.6 | | 915 |

Attachment #1 1

Water Quality Trading Operation and Maintenance Plan

Introduction:

The Water Quality Trading (WQT) Operation and Maintenance (O&M) Plan is meant to be a working document and should be updated as new trading practices are implemented. Currently, the Operation and Maintenance Plan revolves around the Best Management Practice (BMP) construction along the Sinnipee Creek. The attached *BMP Inspection Form* should be completed during annual inspections of BMPs and following major storm events. Inspection forms shall be retained for at least five (5) years to ensure compliance with the WQT Plan.

Publicly Owned BMP:

District representative to complete inspection form annually and following major storm events. The form will then be provided to the Maintenance Supervisor following inspection. The District will address maintenance issues identified during inspection within 30 days. Substantial maintenance issues may require an extended timeframe for generation of plans, specifications, and a public bid process to perform the work. Inspections and O&M activities shall be reported in the annual WQT Report sent to the DNR.

Privately Owned BMP:

District representative to complete inspection form annually and following major storm events. The form will then be provided to the Maintenance Supervisor following inspection. The District will address maintenance issues identified during inspection within 30 days. Substantial maintenance issues may require an extended timeframe for generation of plans, specifications, and a public bid process to perform the work. Maintenance expenses will be incurred by either by the District or Private Property Owner depending on agreement with the District. The Private Property Owner will be allowed to perform maintenance activities at the expense of the Private Property Owner. Inspections and O&M activities shall be reported in the annual WQT Report sent to the DNR.

Quality Assurance:

Riprap gradation and composition shall be provided for each source of material. Streambank shaping and riprap shall be installed per the Grant County Land Conservation Department and NRCS Standards. Contractors to supply rock that is approved by the NRCS and meets criteria in Wisconsin Construction Spec.9.

Installation:

- Staking provided by the Engineer.
- Do not place riprap over frozen or spongy subgrade surfaces.
- Place riprap as indicated on Construction Plans. Do not dump rip-rap over the bank.
- Blend riprap with existing bank.
- Spread soil out in a layer of less than 4" and seed down. Do not spread soil in wetlands.
- All disturbed areas and soil must be seeded and mulched.
- Install habitat structures per Plans and Specifications.

Practice Registration:

The purpose of the "Water Quality Trading Management Practice Registration" form is to report to DNR that a management practice identified in the trading plan has been properly installed and is established

and effective. This information will be used to track implementation progress, verify compliance and perform audits, as necessary. A registration form should be submitted for every management practice that has been identified in the trading plan. If practices are established prior to trading plan submittal, registration forms may be submitted with the trading plan. Otherwise, registration forms should be submitted during the permit term as practices become effective or with the annual report. A blank *Water Quality Trading Management Practice Registration Form 3400-207* is attached and should be submitted following implementation of the trading practice.

Tracking Procedures:

The District will track credits used monthly. The District will report credit usage to the DNR on a monthly basis in the Discharge Monitoring Reports (DMRs). The annual report will summarize the 12 months of credit usage and credit generation. The District will report to DNR any concern that they have that may result in a need to modify the trade agreement and/or this trade plan. For example, a need to generate additional credits based on discharge.

Inspections/Maintenance Considerations:

- A *BMP Inspection Form* is attached.
 - Site: As noted on Construction Plans
 - Condition of BMP: Excellent; Good; Fair; or Poor
 - Maintenance Estimate: Provide an estimate for how long the maintenance will take to complete or a dollar value for completion. This will help determine if the District will perform the work or if the District will hire another entity to perform the work.
 - Date Completed: Following completion of the required maintenance, input the date of completion.
 - Comments: Provide the required maintenance activity along with any other useful information. If the cell provided is not large enough for Comments, write “See Back of Sheet” and provide comments on the reverse side of the Form.
- Following installation, inspect the disturbed areas closely over the next few months to ensure that seeding grows.
- BMPs may settle or shift especially after flooding events or freeze/thaw.
- May need to control weed and brush growth.
- Inspect stabilized areas as needed.
- At a minimum, inspect after major storm events.
- If a BMP has been damaged, repair it promptly to prevent a progressive failure.
- If repairs are needed repeatedly at a location, evaluate the site to determine if the original design conditions have changed.

Routine Maintenance Items that can be performed by District:

- Evaluate BMP condition
 - Reconstruct/replace BMPs that have settled, shifted, or washed out.
- Manage Vegetation
 - Remove invasive/noxious plants.
- Manage Garbage
 - Remove garbage and other debris that could otherwise impair the streambank stability.

Monthly Certification:

Each month, the District will certify that the BMPs are maintained and operating in a manner consistent with this Water Quality Trading Plan or provide a statement noting noncompliance with this Plan. The monthly Discharge Monitoring Report (DMR) will include the following statement as a certification of compliance when the Credit Generating Practice is operating in a manner consistent with the Plan:

“I certify that to the best of my knowledge that the management practices identified in the approved water quality trading plan as the source of phosphorus credits is installed, established and properly maintained.”

Annual Inspection:

An annual inspection of the BMPs will be performed by a licensed Professional Engineer to ensure that the BMPs are functioning as intended in order to meet the requirements of the WQT Plan.

Noncompliance:

The District will notify DNR by telephone call to DNR’s regional wastewater compliance engineer within 24 hours or next business day of becoming aware that phosphorus credits used or intended for use by District are not being generated as outlined in this Water Quality Trading Plan.

The District will submit a written notification within five days after the District recognizes that the phosphorus credits are not being generated as outlined in the Trading Plan. DNR may waive the requirement for submittal for a written notice within five days and instruct the District to submit the written notice with the next regularly scheduled monitoring report required by District’s WPDES Permit.

The written notification should include:

- Description of noncompliance and cause.
- Period of noncompliance including dates and times.
- Schedule for attaining compliance including time and steps toward compliance.
- Plan to prevent reoccurrence of the noncompliance.

Notification of Trade Agreement Termination:

If a trade agreement or the trading plan needs to be terminated during the permit term, the permittee should submit a Notice of Termination to the wastewater engineer/specialist to inform DNR of the termination. DNR staff should use this information to determine if a permit modification is required due to the termination, the termination will result in non-compliance, or other permit actions are required due to the termination. When credits are reduced or eliminated for any reason, the permittee is still required to meet their WQBELs without any grace period. To prevent noncompliance with WQBELs, changes to trading plans must be addressed before credits are lost. Modifying the permit/trading plan will require at least 180 days. A blank *Notification of Water Trade Agreement Termination Form 3400-209* is attached and should be submitted to DNR prior to practice termination, no later than the submittal date of the annual report.

BMP Inspection Form

Date _____

Inspector _____

Reason for Inspection _____

| Reach | Condition of BMP | Required Maintenance | Maintenance Estimate (Time or Cost) | Date Completed | Comments |
|-----------|------------------|----------------------|-------------------------------------|----------------|----------|
| 1 (Right) | | | | | |
| 1 (Left) | | | | | |
| 2 (Right) | | | | | |
| 2 (Left) | | | | | |

Notice: Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

| Applicant Information | | | | | |
|--------------------------------------|---------|----------------------|----------------------|-------|----------|
| Permittee Name | | Permit Number WI- | Facility Site Number | | |
| Facility Address | | | City | State | ZIP Code |
| Project Contact Name (if applicable) | Address | | City | State | ZIP Code |
| Project Name | | | | | |

| Broker/Exchange Information (if applicable) | | |
|-------------------------------------------------------------------------------------------------------|--|--------------|
| Was a broker/exchange be used to facilitate trade? <input type="radio"/> Yes <input type="radio"/> No | | |
| Broker/Exchange Organization Name | | Contact Name |
| Address | | Phone Number |
| | | Email |

| Trade Registration Information (Use a separate form for each trade agreement) | | | | | |
|----------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------|----------------------------|---------------------------|--------------------------|
| Type | Trade Agreement Number | Practices Used to Generate Credits | Anticipated Load Reduction | Trade Ratio | Method of Quantification |
| <input type="radio"/> Urban NPS <input type="radio"/> Agricultural NPS <input type="radio"/> Other | | | | | |
| County | Closest Receiving Water Name | | Land Parcel ID(s) | Parameter(s) being traded | |

The preparer certifies all of the following:

- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| | |
|-----------------------|-------------|
| Signature of Preparer | Date Signed |
|-----------------------|-------------|

Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| | |
|----------------------------------------|-------------|
| Signature of Authorized Representative | Date Signed |
|----------------------------------------|-------------|

| Leave Blank – For Department Use Only | | |
|---------------------------------------------------------|--------------|-----------------------------|
| Date Received | | Trade Docket Number |
| Entered in Tracking System <input type="checkbox"/> Yes | Date Entered | Name of Department Reviewer |

Notification of Water Trade Agreement Termination

Form 3400-209 (1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., and ch. NR 217 Wis. Adm. Code, this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

| Applicant Information | | | | |
|--------------------------------------|----------------------|----------------------|----------|----------|
| Permittee Name | Permit Number WI- | Facility Site Number | | |
| Facility Address | City | State | ZIP Code | |
| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
| Project Name | | | | |

| Credit Generator Information | |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Credit generator type (select all that apply): | <input type="checkbox"/> Permitted Discharge (non-MS4/CAFO) <input type="checkbox"/> Urban nonpoint source discharge <input type="checkbox"/> Permitted MS4 <input type="checkbox"/> Agricultural nonpoint source discharge <input type="checkbox"/> Permitted CAFO <input type="checkbox"/> Other - Specify: _____ |
| Trade Agreement number(s) to be terminated including affected land parcel ID(s): | |

| | |
|-------------------------------------------|-------------------------------|
| Amount of trading credit being terminated | Effective date of termination |
| Reason for termination | |

| | |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Is this agreement being updated or replaced? | <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unsure |
| Will this termination result in non-compliance with the effective limit or other permit requirements? | <input type="radio"/> Yes; Name: _____ <input type="radio"/> No <input type="radio"/> Unsure |

The preparer certifies all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.

| | |
|-----------------------|-------------|
| Signature of Preparer | Date Signed |
|-----------------------|-------------|

| Authorized Representative Signature | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. | |
| Signature of Authorized Representative | Date Signed |

Attachment #12

LEGEND

| | | | | | |
|--|-------------------------------|--|-------------------------------------------------------|--|---------------------------------------------|
| | EX. CON. MANHOLE | | PROP. SANITARY SEWER LATERAL | | PROP. TYPE "X" CURB & GUTTER |
| | EX. ECC. MANHOLE | | PROP. <6" SANITARY SEWER MAIN | | PROP. REVERSE-PITCH CURB & GUTTER |
| | EX. LIFT STATION | | PROP. 6" SANITARY SEWER MAIN | | PROP. HOT MIX ASPHALT PAVEMENT (DRIVEWAY) |
| | EX. CLEAN OUT | | PROP. 8" SANITARY SEWER MAIN | | PROP. 4" CONCRETE SIDEWALK |
| | EX. FIRE HYDRANT | | PROP. 10" SANITARY SEWER MAIN | | PROP. 6" CONCRETE PAVEMENT |
| | EX. WATER SERVICE | | PROP. 12" SANITARY SEWER MAIN | | PROP. 8" CONCRETE PAVEMENT |
| | EX. WATER VALVE | | PROP. 15" SANITARY SEWER MAIN | | PROP. GRAVEL SHOULDER / DRIVEWAY |
| | EX. YARD HYDRANT | | PROP. 18" SANITARY SEWER MAIN | | EROSION MATTING (MILD SLOPES) |
| | EX. CATCH BASIN | | PROP. CIPP LINER | | EROSION MATTING (STEEP SLOPES) |
| | EX. STORM INLET | | PROP. FLOW DIRECTION | | PROP. REGRADING AND LANDSCAPING |
| | EX. NATURAL GAS VALVE | | PROP. WATER SERVICE | | PROP. RIP-RAP |
| | EX. NATURAL GAS METER | | PROP. <4" WATER MAIN | | PROP. STORM STRUCTURES - PROFILE |
| | EX. POWER POLE | | PROP. 4" WATER MAIN | | PROP. STORM PIPE(RCP) - PROFILE |
| | EX. LIGHT POLE | | PROP. 6" WATER MAIN | | PROP. STORM PIPE(CMP OR HDPE) - PROFILE |
| | EX. WARNING SIREN | | PROP. 8" WATER MAIN | | PROP. SANITARY STRUCTURE - PROFILE |
| | EX. TEL. PEDESTAL | | PROP. 10" WATER MAIN | | PROP. WATER MAIN PIPE - PROFILE |
| | EX. MAILBOX | | PROP. 12" WATER MAIN | | PROP. CLAY LINER - PROFILE |
| | EX. LP TANK | | PROP. 15" WATER MAIN | | PROP. SANITARY SEWER FORCE MAIN - PROFILE |
| | EX. SATELLITE DISH | | PROP. <12" STORM SEWER | | PROP. SPOT REPAIR - PROFILE / PLAN VIEW |
| | EX. POST OR POLE | | PROP. 12" STORM SEWER | | PROP. CASING PIPE - PROFILE |
| | EX. STREET SIGN | | PROP. 15" STORM SEWER | | PROP. CLEARING AND GRUBBING |
| | EX. EVERGREEN TREE | | PROP. <12" STORM SEWER | | PROP. BUILDING REMOVAL |
| | EX. DECIDUOUS TREE | | PROP. 12" STORM SEWER | | PROP. SIDEWALK REMOVAL |
| | EX. TREE STUMP | | PROP. 18" STORM SEWER | | PROP. PRESSURE-REDUCING VALVE STATION |
| | EX. BUSH/SHRUB | | PROP. 24" STORM SEWER | | PROP. FIRE HYDRANT |
| | EX. TREE/BRUSH LINE | | PROP. 30" STORM SEWER | | PROP. WATER SERVICE |
| | EX. WINDMILL | | PROP. 36" STORM SEWER | | PROP. WATER SERVICE WITH VALVE BOX SLEEVE |
| | EX. PARK BENCH | | PROP. 48" STORM SEWER | | PROP. WATER VALVE |
| | EX. BENCHMARK | | PROP. CURB AND GUTTER | | PROP. WATER BEND - HORIZONTAL |
| | SURVEY CONTROL POINT | | PROP. CURB BACK OPENING | | PROP. WATER BEND - VERTICAL |
| | EX. PROPERTY PIN | | PROP. U.GRD GAS UTILITY | | PROP. WATER BEND <5° |
| | RIGHT-OF-WAY | | PROP. U.GRD ELECTRIC UTILITY | | PROP. WATER TEE |
| | PROPERTY LINE | | PROP. U.GRD CABLE TV UTILITY | | PROP. WATER CROSS |
| | EASEMENT | | PROP. U.GRD TELEPHONE UTILITY | | PROP. WATER REDUCER |
| | EX. SAN. S. LATERAL | | PROP. U.GRD FIBER OPTIC UTILITY | | PROP. MJ PLUG |
| | EX. 6" SAN. S. MAIN | | PROP. OVERHEAD ELECTRIC | | PROP. 4" DIA. STORM MANHOLE |
| | EX. 8" SAN. S. MAIN | | PROP. CROSSING OF N. GAS UTILITY | | PROP. 5" DIA. STORM MANHOLE |
| | EX. 10" SAN. S. MAIN | | PROP. UTILITY POLE | | PROP. INLET |
| | EX. 12" SAN. S. MAIN | | PROP. LIGHT POLE | | PROP. 4" DIA. INLET |
| | EX. 15" SAN. S. MAIN | | PROP. FENCE | | PROP. 6" DIA. INLET |
| | EX. FLOW DIRECTION | | TEMPORARY EASEMENT | | PROP. 4" DIA. CATCH BASIN- W/ 2'X3' CASTING |
| | EX. CAPPED SERVICE | | CONSTRUCTION EASEMENT | | PROP. 5" DIA. CATCH BASIN- W/ 2'X3' CASTING |
| | EX. WATER SERVICE | | ESTIMATED DISTURBANCE LIMITS | | PROP. 6" DIA. CATCH BASIN- W/ 2'X3' CASTING |
| | EX. 4" WATER MAIN | | PROP. CONTOUR | | PROP. 4'X6' CATCH BASIN W/2'X3' CASTING |
| | EX. 6" WATER MAIN | | PROP. DRAINAGE SWALE | | PROP. CURB OPENING CASTING |
| | EX. 8" WATER MAIN | | PROP. SILT FENCE | | PROP. 2'X3' CATCH BASIN |
| | EX. 10" WATER MAIN | | PROP. EROSION CONTROL SEDIMENT LOG | | PROP. ADJUSTED CATCH BASIN TOP |
| | EX. 12" WATER MAIN | | PROP. PAVEMENT MARKING | | PROP. WISDOT TYPE 8 INLET |
| | EX. 12" STORM SEWER | | PAINTED TRAFFIC ARROW | | PROP. WISDOT TYPE 9 INLET |
| | EX. 15" STORM SEWER | | ADA PARKING DESIGNATION | | PROP. CMP ENDWALL |
| | EX. 18" STORM SEWER | | PARKING STALL COUNT | | PROP. RCP ENDWALL |
| | EX. 24" STORM SEWER | | RADIUS POINT/SIZE STA. ON CENTERLINE | | |
| | EX. 27" STORM SEWER | | PROP. HANDICAP RAMP WITH DETECTABLE WARNING FIELD | | |
| | EX. 30" STORM SEWER | | SOIL BORING LOCATION | | |
| | EX. 36" STORM SEWER | | RIVER FLOW DIRECTION | | |
| | EX. 42" STORM SEWER | | PROP. 4" DIA. SANITARY MANHOLE | | |
| | EX. 48" STORM SEWER | | PROP. 5" DIA. SANITARY MANHOLE | | |
| | EX. CURB AND GUTTER | | PROP. MANHOLE CHIMNEY REHABILITATION / TOP ADJUSTMENT | | |
| | EX. U.GRD N. GAS UTILITY | | PROP. SANITARY LIFT STATION | | |
| | EX. U.GRD ELECTRIC UTILITY | | | | |
| | EX. U.GRD CABLE TV UTILITY | | | | |
| | EX. U.GRD TELEPHONE UTILITY | | | | |
| | EX. U.GRD FIBER OPTIC UTILITY | | | | |
| | EX. OVERHEAD ELECTRIC | | | | |
| | EX. FENCE | | | | |
| | EX. RAILROAD TRACKS | | | | |
| | EX. CONTOUR | | | | |
| | EX. DRAINAGE SWALE | | | | |

KEY NOTES

- 100 PROPOSED SILT FENCE FOR EROSION CONTROL.
- 101 PROPOSED SEDIMENT LOG FOR EROSION CONTROL.
- 102 PROPOSED TRACKING PAD FOR EROSION CONTROL.
- 103 RE-GRADE YARD/DITCH LINE (MIN. SLOPE 1.0%).
- 104 PROPOSED EROSION MAT CLASS 1, TYPE 'B'.
- 105 INSTALL TYPE 'D' INLET PROTECTION.
- 106 PROPOSED MAIL BOX RELOCATION.
- 107 ITEM TO REMAIN.
- 108 CONTRACTOR TO REMOVE ITEM.
- 109 PROPOSED TURBIDITY BARRIER (TYP.) (SEE DETAIL - SHEET C203).
- 110 PROPOSED EROSION CONTROL REVEGETATIVE MAT (ECRM).
- 111 REMOVE AND SALVAGE TO OWNER IN PRE-CONSTRUCTION CONDITION.
- 112 REINSTALL STREET SIGN AS PER OWNER/WISDOT REQUIREMENTS.
- 113 PROPOSED STREAM BANK GRADING (2:1 SLOPE) WITH RIP-RAP TO TOP OF BANK (SEE DETAIL - SHEET C202).
- 114 PROPOSED STREAM BANK GRADING (6:1 SLOPE)(SEE DETAIL - SHEET C202).
- 200 PROPOSED SANITARY SEWER [SIZE].
- 201 NEW SANITARY SEWER LATERAL [SIZE].
- 202 REPLACE EXISTING SANITARY SEWER LATERAL.
- 203 RECONNECT EXISTING SANITARY SEWER LATERAL.
- 204 CONNECTION TO EXISTING SANITARY SEWER PIPE/STRUCTURE.
- 205 REMOVE EXISTING SANITARY SEWER PIPE /STRUCTURE.
- 206 REHABILITATE SANITARY MANHOLE; SEE TABLE 'B'.
- 207 SANITARY SEWER SPOT REPAIR.
- 208 ABANDON AND CAP EXISTING SANITARY SEWER.
- 209 ABANDON EXISTING SANITARY SEWER LATERAL.
- 210 CONTRACTOR TO FIELD VERIFY SANITARY SEWER LATERAL LOCATION/ACTIVITY AND REPLACE ACCORDING TO ENGINEER.
- 300 PROPOSED WATER MAIN [SIZE].
- 301 NEW WATER SERVICE [SIZE].
- 302 REPLACE EXISTING WATER SERVICE WITH 1" WATER SERVICE.
- 303 RECONNECT EXISTING WATER SERVICE.
- 304 DIRECTIONAL DRILL PROPOSED WATER SERVICE.
- 305 CONNECTION TO EXISTING WATER MAIN.
- 306 EXISTING HYDRANT TO BE REMOVED AND SALVAGED TO OWNER.
- 307 REMOVE EXISTING WATER MAIN VALVE BOX/STRUCTURE.
- 308 ADJUST EXISTING WATER MAIN VALVE BOX.
- 309 ABANDON, DRAIN, & CAP EXISTING WATER MAIN.
- 310 ABANDON EXISTING WATER SERVICE.
- 311 CONTRACTOR TO FIELD VERIFY WATER SERVICE LOCATION/ACTIVITY AND REPLACE ACCORDING TO ENGINEER.
- 400 PROPOSED STORM SEWER [SIZE].
- 401 CONNECT EXISTING ROOF DRAIN TO CURB OPENING
- 402 CONNECTION TO EXISTING STORM SEWER PIPE/STRUCTURE.
- 403 REMOVE EXISTING STORM SEWER PIPE/STRUCTURE.
- 404 ABANDON & CAP EXISTING STORM SEWER.
- 405 ADJUST EXISTING STORM STRUCTURE.
- 500 TREE & STUMP TO BE REMOVED (LESS THEN 12")
- 501 TREE & STUMP TO BE REMOVED (12" & GREATER)
- 502 SHRUB TO BE REMOVED.
- 503 CLEAR AND GRUB BRUSH LINE AS NECESSARY TO COMPLETE CONSTRUCTION. ALL CLEARING TO BE VERIFIED BY PROJECT ENGINEER.
- 504 REMOVE AND REINSTALL/REPLACE EXISTING LANDSCAPING, FENCE, RETAINING WALL, ETC. (IF NECESSARY).
- 505 REMOVE EXISTING LANDSCAPING, FENCE, RETAINING WALL, ETC.
- 506 POLE/PEDESTAL TO BE SECURED BY UTILITY COMPANY DURING CONSTRUCTION.
- 507 POLE TO BE RELOCATED BY UTILITY COMPANY.
- 508 GUY WIRE TO BE RELOCATED BY UTILITY COMPANY.
- 509 PEDESTAL TO BE RELOCATED BY UTILITY COMPANY.
- 510 UTILITY CONFLICT - TO BE RELOCATED/ADJUSTED BY UTILITY COMPANY.
- 511 POTENTIAL UTILITY CONFLICT - VERIFY WITH UTILITY COMPANY.
- 512 CAUTION! - UTILITY CROSSING.
- 600 REMOVE EXISTING CURB & GUTTER.
- 601 PROPOSED 24" CONCRETE CURB & GUTTER.
- 602 PROPOSED 30" CONCRETE CURB & GUTTER.
- 603 PROPOSED 36" CONCRETE CURB & GUTTER.
- 604 MATCH TO EXISTING CURB & GUTTER.
- 605 PROVIDE TYPE 'X' CURB.
- 606 PROVIDE REVERSE-PITCH CURB & GUTTER.
- 607 PROVIDE CURB TAPER.
- 608 REMOVE ASPHALT/CONCRETE/WALL/STEPS.
- 609 PROPOSED 4" CONCRETE SIDEWALK.
- 610 PROPOSED 6" CONCRETE SIDEWALK/DRIVEWAY.
- 611 PROPOSED 6" CONCRETE PAVEMENT.
- 612 PROPOSED 8" CONCRETE PAVEMENT.
- 613 PROPOSED CONCRETE STEPS. STEP RISE HEIGHT AND STEP TREAD DEPTH SHALL MEET APPLICABLE BUILDING CODES. CONTRACTOR SHALL CONFIRM REQUIRED NUMBER OF STEPS WITH PROJECT ENGINEER PRIOR TO INSTALL.
- 614 PROPOSED 2' GRAVEL SHOULDER.
- 615 REGRADE EXISTING GRAVEL.
- 616 PROPOSED GRAVEL DRIVEWAY.
- 617 REMOVE & REPLACE GRAVEL DRIVEWAY.
- 618 REMOVE GRAVEL DRIVEWAY & REPLACE WITH BITUMINOUS DRIVEWAY/APRON.

TRAFFIC CONTROL NOTE:

ALL CONTRACTORS MUST CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE REQUIREMENTS OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION. ONE LANE OF TRAFFIC MUST REMAIN OPEN DURING AND AFTER ALL CONSTRUCTION ACTIVITIES FOR EMERGENCY VEHICLE ACCESS.

STREET SIGN NOTE:

CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING, STORING, AND RESETTING ALL PERMANENT SIGNS. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING SIGNS UNTIL REMOVED. CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL TEMPORARY SIGNS THAT MAY BE REQUIRED.

TRAFFIC SIGN NOTE:

CONTRACTOR TO PROVIDE TEMPORARY TRAFFIC SIGNS FOR ANY TRAFFIC SIGNS DISTURBED DURING CONSTRUCTION. ALL DISTURBED TRAFFIC SIGNS MUST BE REPLACED AND INSTALLED AS PER LOCAL REGULATIONS AT THE COMPLETION OF THE PROJECT.

EROSION CONTROL NOTE:

CONTRACTOR TO INSTALL BACKFILL MATERIAL INTO THE EXCAVATED TRENCH AS SOON AS POSSIBLE TO IMPLEMENT EROSION CONTROL.

PROPERTY LINE AND RIGHT-OF-WAY NOTE:

ALL RIGHT-OF-WAYS AND PROPERTY LINES SHOWN ARE APPROXIMATE AND FOR ILLUSTRATIVE PURPOSES ONLY. A PROPERTY SURVEY PERFORMED BY A PROFESSIONAL LAND SURVEYOR SHOULD BE COMPLETED TO DETERMINE THE ACTUAL PROPERTY LINE AND RIGHT-OF-WAY LOCATIONS.

MAILBOX RELOCATION NOTE:

CONTRACTOR TO RELOCATE EXISTING MAILBOXES DURING CONSTRUCTION (COORDINATE AND VERIFY WITH LOCAL POSTAL SERVICE ON LOCATION). RESET BEHIND CURB AND GUTTER OR SHOULDER ACCORDING TO THE REQUIREMENTS OF THE LOCAL POSTMASTER UPON COMPLETION OF STREET CONSTRUCTION.

TREE TRIMMING NOTE:

CONTRACTOR TO PROPERLY TRIM ALL TREE BRANCHES, ROOTS, AND BUSHES DISTURBED DUE TO STREAM BANK IMPROVEMENTS.

TREE REMOVAL NOTE:

CONTRACTOR TO CONTACT ENGINEER OR KIELER SANITARY DISTRICT NO. 1 FOR VERIFICATION PRIOR TO ANY TREE REMOVAL.

SAW CUT NOTE:

CONTRACTOR TO PROVIDE FULL DEPTH SAW CUTS AND REPLACE PAVEMENT.

UTILITIES' NOTE:

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLAN HAVE BEEN OBTAINED BY FIELD CHECKS, A UTILITY LOCATE THROUGH DIGGER'S HOTLINE, AND SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE SURVEYOR DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS. THE CONTRACTOR SHOULD VERIFY LOCATIONS W/ THE UTILITY COMPANIES AND KIELER SANITARY DISTRICT NO. 1 PRIOR TO STARTING ANY EXCAVATION.

- 619 REMOVE & REPLACE HMA PAVEMENT.
- 620 REMOVE & REPLACE HMA PAVEMENT DRIVEWAY.
- 621 PROPOSED HMA PAVEMENT.
- 622 MATCH TO EXISTING EDGE PAVEMENT.
- 623 PROPOSED RESIDENTIAL HMA PAVEMENT DRIVEWAY.
- 624 PROPOSED COMMERCIAL HMA PAVEMENT DRIVEWAY.
- 625 REMOVE & REPLACE 4" CONCRETE SIDEWALK.
- 626 REMOVE & REPLACE 6" CONCRETE SIDEWALK/DRIVEWAY.
- 627 PROPOSED HANDICAP RAMP WITH - D. WARN. FIELD [S.F.].
- 628 SAW CUT PCC PAVEMENT.
- 629 SAW CUT HMA PAVEMENT.
- 630 PROPOSED BITUMINOUS WEDGE CURB.

NOTES:

SITE RESTORATION NOTE:

CONTRACTOR WILL BE RESPONSIBLE FOR REPLACEMENT OF ALL DISTURBED PROJECT AREA COMPONENTS INCLUDING, BUT NOT LIMITED TO, EXISTING CONCRETE, BITUMINOUS PAVEMENT, GRAVEL, CULVERTS, WATER AND SANITARY SEWER SYSTEM COMPONENTS, STORM SEWER SYSTEM COMPONENTS, TREES, LAWN ORNAMENTS, FENCING, YARD LANDSCAPING, RETAINING WALLS, MAILBOXES, AND LANDSCAPE AREAS.

PROPERTY DAMAGES:

THE CONTRACTOR IS RESPONSIBLE FOR THE PRESERVATION OF ADJACENT PROPERTY AND FOR ANY DAMAGE TO THE SITE OR TO ADJACENT PROPERTY INCIDENTAL TO THE CONSTRUCTION ACTIVITIES. AFTER THE COMPLETION OF CONSTRUCTION, ANY AREAS ADJACENT TO THE CONSTRUCTION SITE DAMAGED BY THE CONTRACTOR DURING EXECUTION OF THE CONTRACT SHALL BE RESTORED TO MATCH THE PRECONSTRUCTION CONDITIONS.

GENERAL NOTES:

1. CONTRACTOR SHALL REPAIR ALL DRIVEWAYS, FENCES, AND FIELD ROADS DAMAGED DUE TO CONSTRUCTION ACTIVITIES.
2. CONTRACTOR MUST PROVIDE THE CITY WITH A MINIMUM 24-HR NOTICE OF PROPOSED CONSTRUCTION ACTIVITIES. THE CITY IS REQUIRED TO PERFORM REMOVAL OF ENDANGERED RESOURCES EACH DAY PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO INSTALL EROSION CONTROL AND TURBIDITY BARRIER PRIOR TO COMMENCING CONSTRUCTION.
4. ALL PROPOSED GRADING LOCATIONS TO BE CLEARED AND GRUBBED BY THE CONTRACTOR.
5. SOIL SPREAD WITHIN THE FLOOD PLAIN AREA SHALL NOT EXCEED FOUR INCHES (4") OF DEPTH AND SHALL NOT BE DEPOSITED INTO WETLANDS.
6. CONTRACTOR SHALL NOT REMOVE TREES, SOIL, ROCK, AND THE LIKE FROM THE SITE WITHOUT CONSENT OF THE OWNER.
7. CONTRACTOR TO INSTALL EXISTING DRAIN TILES THROUGH PROPOSED GRADING AND RIP-RAP.
8. CONTRACTOR TO RESTORE LANDSCAPE ALL DISTURBED AREAS.

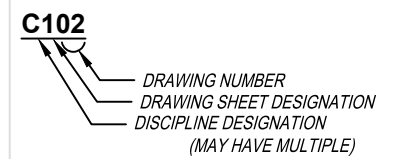
DISCIPLINE DESIGNATORS

| DISCIPLINE | DESIGNATION |
|--------------------------|-------------|
| REMOVAL | R |
| GENERAL | G |
| CIVIL | C |
| LANDSCAPE | L |
| AQUATIC | AQ |
| ARCHITECTURAL | A |
| STRUCTURAL | S |
| ELECTRICAL | E |
| INSTRUMENTATION/CONTROLS | N |
| PROCESS | D |
| PLUMBING | P |
| HVAC /MECHANICAL | M |

DISCIPLINE DESIGNATORS

| TYPE | DESIGNATION |
|----------------------|-------------|
| NOTES & SCHEDULES | 0 |
| PLANS | 1 |
| ELEVATIONS & DETAILS | 2 |
| CROSS-SECTIONS | 3 |
| DIAGRAMS | 4 |

DRAWING SHEET DESIGNATION



SHEET NUMBER IDENTIFICATION

ENGINEER:

 DELTA 3
 CIVIL ENGINEERING
 875 SOUTH CHESTNUT STREET
 PLATEVILLE, WISCONSIN 53188
 888 JOHNSON STREET
 DUBUQUE, IOWA 52001
 PHONE: (608) 348-5355
 PHONE: (563) 542-0005

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:
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