Permit Fact Sheet

General Information

Permit Number:	WI-0023418-10-0	
Permittee Name:	VILLAGE OF BLUE RIVER	
Address:	PO Box 217	
City/State/Zip:	Blue River WI 53518	
Discharge Location:	South Bank of the Jones Slough, directly north of the WWTF (NE ¼ of NE ¼ Section 11, T8N, R2W)	
Receiving Water:	Jones Slough (Blue River Watershed, Lower Wisconsin River Basin) in Grant County	
StreamFlow ($Q_{7,10}$):	52 cfs	
Stream Classification:	Warm Water Sport Fish (WWSF), non-public water supply	
Discharge Type:	Existing, Continuous	
Design Flow(s)	Annual Average	0.042 MGD
Significant Industrial Loading?	None	
Operator at Proper Grade?	Facility is Advanced with subclasses A1 – Suspended Growth Processes, B – Solids Separation, C – Biological Solids/Sludges, D – Disinfection, P – Biological Nutrient Removal (Phosphorus), SS – Sanitary Sewage Collection System. Advanced certification is required by May 2025. Subclass SS certification is required by the end of this permit term.	
Approved Pretreatment Program?	N/A	

Facility Description

The Village of Blue River operates an extended aeration activated sludge treatment process with biological phosphorus removal, final clarification, and seasonal disinfection via ultraviolet light. The biological phosphorus removal upgrade was completed in 2022 with the installation of two selector tanks, along with a new sludge storage tank and mechanical screen. Effluent is discharged year-round to the Jones Slough directly to the north of the treatment facility. The annual average design flow of the facility is 0.042 million gallons per day (MGD) with an average of 17,000 gallons discharged per day. Sludge that is produced is aerated and stored on-site until it is land applied on Department approved fields.
The discharge location has been updated to Jones Slough for clarification and accuracy.

The previous permit identified the discharge location as the Blue River. Although Jones Slough may be seen as a continuation of the Blue River, the Department has identified Jones Slough as a unique waterbody (WBIC: 1210900).

Substantial Compliance Determination

Most conditions and standard requirements of the current WPDES permit are being met. After a desktop review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site inspection on April 12, 2023, the permittee has been found to be in substantial compliance with their current WPDES permit.
Compliance determination entered by Caitlin Oconnell, Wastewater Engineer on May 03, 2023.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	N/A	Influent: 24-hour flow proportional composite intake samples shall be collected from the influent pipe prior to the fine screen.
001	0.017 MGD (2022 Average)	Effluent: 24-hour flow proportional composite effluent samples shall be collected after the final clarifier, prior to UV disinfection. Grab samples shall be taken after UV disinfection, prior to discharge to Jones Slough. Flow monitoring occurs at V-notch weir after UV disinfection.
002	1.5 Dry US Tons (2023 Permit Application)	Aerated, Liquid, Class B. Representative sludge samples shall be collected from the sludge holding tanks.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

The sample frequency has increased to 3/week to align with effluent discharge monitoring.

Explanation of Limits and Monitoring Requirements

BOD_5 and Total Suspended Solids: Tracking of BOD_5 and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in the Standard Requirements section of the permit.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through Sept. annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through Sept. annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Limit represents a minimum control level, consistent with what is already effective, and will be retained throughout the permit term. See 'Water Quality Trading (WQT)' sections for more information.
Phosphorus, Total		lbs/day	3/Week	Calculated	Report daily mass discharged using Equation 1a. in the 'Water Quality Trading (WQT)' section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) section. Available TP Credits are specified in Table 2 and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 4a. in the Water Quality Trading

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					(WQT) section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Value entered on the last day of the month. Value entered at the end of the six-month period (June 30 and December 31).
WQT Computed Compliance (TP)	6-Month Avg	0.026 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 4b. in the Water Quality Trading (WQT) section. Value entered at the end of the six-month period (June 30 and December 31).
WQT Credits Used (TP)	Annual Total	50.5 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed below.
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only, Jan. - Dec. 2028.
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring only, Jan. - Dec. 2028.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only, Jan. - Dec. 2028.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Flow: The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.

BOD_5 and Total Suspended Solids: The sample frequency for these parameters has increased to 3/week.

E. Coli: Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

pH: The sample frequency for this parameter has been changed to 5/week.

Phosphorus: The sample frequency for this parameter has been increased to 3/week. The Village of Blue River was granted coverage under the phosphorus multi-discharger variance during the prior permit term to address phosphorus Water Quality-Based Effluent Limitations (WQBELs). For this permit term, the Village has established a water quality trade by utilizing grading and/or riprap for stabilization of oxbow chutes within the local watershed, thereby generating 50.5 lbs/yr of phosphorus credit. These credits are applied in this permit to demonstrate compliance with final phosphorus WQBELs. One year of MDV payment schedule is retained in this permit to account for required offset payments in 2024.

Nitrogen Ammonia: The new timeframe for monitoring is year 2028.

Copper: The sample frequency for this parameter has changed to monthly. The new timeframe for monitoring is year 2028.

Chloride: The new timeframe for monitoring is year 2028.

Acute WET: Acute WET testing has been removed for the proposed permit.

Total Nitrogen Monitoring (TKN, N02+N03 and Total N): Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limits Memo for the Blue River Wastewater Treatment Facility dated October 2, 2023, prepared by Sarah Luck and used for this reissuance.

BOD_5, Total Suspended Solids (TSS), and pH: No changes are recommended in the categorical permit limitations for BOD_5, TSS, and pH. Because the water quality criteria, reference effluent flow rates and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time. Where the receiving water is classified as Warm Water Sport Fish (WWSF) as defined in s. NR 102.04(3)(b), the categorical limits for BOD_5, TSS, and pH are those limits enumerated in ss. NR 210.05(1)(a) – (c).

E. Coli: Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period, and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

E. coli monitoring is required at the permit effective date. E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply.

Phosphorus: Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for the Jones Slough is 0.075 mg/L. In this case, the WQBEL is 0.225 mg/L (monthly average), 0.075 mg/L & 0.026 lbs/day (6-month average). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.225 mg/L). This final effluent limit was derived from and complies with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. A minimum control level of 1.0 mg/L, consistent with what is already effective, will be retained in the permit.

The wastewater treatment facility is not able to meet the WQBEL. This permit authorizes the use of trading as a tool to demonstrate compliance with the phosphorus WQBELs. This permit includes terms and conditions related to the Water Quality Trading Plan (WQT-2023-0009) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Village is implementing stabilization of oxbow chutes using grading and/or riprap. The WQT Plan proposes the generation of 50.5 lbs/yr phosphorus credits for the next five years.

Additional WQT subsections in the permit provide information on compliance determinations, annual reporting and re-opening of the permit.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Based upon ammonia data reported from January 2021 through December 2021, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. Therefore, no limits are needed, but monitoring during the fourth year of the permit term is included.

Copper: The permit includes monthly monitoring to ensure a minimum of 11 sample results are available at the next permit reissuance.

Chloride: Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. The permit includes monthly monitoring to ensure a minimum of 11 sample results are available at the next permit reissuance.

Whole Effluent Toxicity: Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N): The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Monitoring Frequency: The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.
The Department has been revisiting the sampling frequencies at every facility to evaluate whether current frequencies are appropriate or if an increase is warranted. The frequencies for these parameters (BOD, TSS, pH, Phosphorus) were increased to align Blue River with other facilities of similar sizes to ensure fairness and in consideration of department guidance on sampling frequencies.
Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The department has determined at this time that the aforementioned changes in monitoring frequency are warranted based on the size and type of the facility.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform	Injection	Land Application	1.5
Does sludge management demonstrate compliance? **Yes**						
Is additional sludge storage required? **No**						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? **Yes** Special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility.						
Is a priority pollutant scan required? **No, design flow is less than 5 MGD.**						

Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring only. January - December 2026

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitoring only. January - December 2026
Radium 226 Dry Wt		pCi/g	Annual	Composite	
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

PCB: The new timeframe for monitoring PCBs is calendar year 2026.

PFAS: Annual sludge monitoring is included in the proposed permit pursuant s. NR 204.06(2)(b)9, Wis. Adm. Code.

Radium-226: Previously drinking water supply well SB757 had Radium-226 levels greater than 2 pCi/liter.

Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code. Radium requirements are addressed in s. NR 204.07(3)(n), Wis. Adm. Code. Sludge monitoring for Radium-226 is included in the permit because data from the previous permit term shows levels of Radium-226 above 2 pCi/g in the sludge.

PFAS: The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS".

4 Schedules

4.1 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule. The price per pound will be set at the time of permit reissuance and will apply for the duration of the permit.

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: (lbs of phosphorus discharged minus the permittee's target value) times ($52.02 per pound) or $640,000, whichever is less. See the payment calculation steps in WPDES Permit No. WI-0023418-09-1.	03/01/2025

The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is $50.00 adjusted for CPI.	

4.1.1 Explanation of Schedule

Phosphorus Payment per Pound to County: This schedule accounts for payments accrued in 2024 while covered under the phosphorus MDV. WPDES Permit No. WI-0023418-09-1 can be referenced for more information about the MDV and payment calculation steps.

4.2 Annual Water Quality Trading (WQT) Report

Required Action	Due Date
Annual WQT Report: Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include: The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance; The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source; A summary of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and 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.	01/31/2025
Annual WQT Report #2: Submit an annual WQT report that shall cover the previous year.	01/31/2026
Annual WQT Report #3: Submit an annual WQT report that shall cover the previous year.	01/31/2027
Annual WQT Report #4: Submit the 4th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	01/31/2028
Annual WQT Report #5: Submit an annual WQT report that shall cover the previous year.	01/31/2029
Annual WQT Report Required After Permit Expiration: In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

4.2.1 Explanation of Schedule

Annual Water Quality Trading (WQT) Reports: Reports are required, starting in 2025, that include the following information:

- Verification that site inspections occurred;
- Brief summary of site inspection findings;

- Identification of noncompliance or failure to implement any terms or conditions of the permit or trading plan that have not been reported in discharge monitoring reports;
- Any applicable notices of termination or management practice registration; and
- A summary of credits used each month over the calendar year

4.3 Operator Certification

Required Action	Due Date
Operator Certification - Advanced Facility: Pursuant to s. NR 114.53(5), Wis. Adm. Code, upon a change in a wastewater treatment plant's level of operations from basic to advanced, the operator-in-charge shall have 36 months to obtain advanced certification, provided the person is making earnest efforts towards advanced certification and that the treatment plant is in compliance with all terms and conditions of its WPDES permit. By the Due Date, the permittee shall notify the Department, in writing, of the certified operator-in-charge's name and certification number.	05/31/2025
Operator Certification - Sanitary Sewage Collection System Subclass: Pursuant to s. NR 114.57(5), Wis. Adm. Code, upon development and availability of the sanitary sewage collection system subclass SS study guide and examination, and at the time of permit reissuance, collection system operators shall have a permit term of 5 years to obtain collection system certification. By the Due Date, the permittee shall notify the Department, in writing, of the certified operator's name and certification number.	03/31/2029

4.3.1 Explanation of Schedule

Operator Certification: A compliance schedule in included in the permit to provide time for the operator in charge to obtain proper certification for an Advanced facility and Sanitary Sewage Collection System (SS Subclass).

4.4 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit an update to the management plan to optimize the land application system performance by the Due Date. The management plan shall be consistent with the requirements of this permit, and ch. NR 204, Wis. Adm. Code. All Department issued approval maps and Land Application Approval Forms (3400-122) for all approved sites shall be included in the management plan to comply with s. NR 204.07(2), Wis. Adm. Code. Sites that no longer match approval conditions in the Department issued approval maps and Land Application Approval Forms (3400- 122) in the management plan, including those sites without approval maps or forms, must be reviewed and potentially reauthorized to comply with ch. NR 204, Wis. Adm. Code. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	12/31/2028

4.4.1 Explanation of Schedule

Land Application Management Plan: An updated land application management plan shall be submitted to the department for approval in the fourth year of the permit term.

Special Reporting Requirements
None.

Other Comments:
None.

Attachments:
Water Quality Based Effluent Limits dated October 2, 2023

WQT Plan Conditional Approval Letter dated December 19, 2023

Water Quality Trading Plan dated December 1, 2023

Expiration Date:
March 31, 2029

Justification Of Any Waivers From Permit Application Requirements
No waivers were requested or given from permit application requirements.

Prepared By: BetsyJo Howe, Wastewater Specialist

Date: 2/2/2024

Updated (based on fact check comments): Editorial changes for clarity. 2/9/2024

Updated (based on public notice comments):

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 2, 2023

TO: Permit Drafter

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for the Blue River Wastewater Treatment Facility WPDES Permit No. WI-0023418-10-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Blue River Wastewater Treatment Facility in Grant County. This municipal wastewater treatment facility (WWTF) discharges the Jones Slough, located in the Blue River Watershed in the Lower Wisconsin River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5			45 mg/L	30 mg/L		2
TSS			45 mg/L	30 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Ammonia Nitrogen						1
Bacteria						3
E. coli				126 #/100 mL geometric mean		
Phosphorus WQT Limit Final WQBEL				1.0 mg/L 0.225 mg/L	0.075 mg/L 0.026 lb/day	4
Chloride						5
Copper, Total Recoverable						5
TKN, Nitrate+Nitrite, and Total Nitrogen						6

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. No compliance schedule is recommended.
4. A minimum control level is required with water quality trading (WQT). The limit of 1.0 mg/L is already in effect and will serve as the minimum control level.
5. Monthly monitoring during the fourth year of the permit term is recommended.
6. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal

permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).

No WET testing is required because information related to the discharge indicates low risk for toxicity.

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, and additional limits are not required.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

Attachments (2) – Narrative and Site Map

PREPARED BY: Sarah Luck _____ Date: October 2, 2023

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Attachment #1

Water Quality-Based Effluent Limitations for
Blue River Wastewater Treatment Facility

WPDES Permit No. WI-0023418-10-0

PART 1 – BACKGROUND INFORMATION

Facility Description
The Village of Blue River operates an extended aeration activated sludge treatment process with biological phosphorus removal, final clarification, and seasonal UV disinfection. Effluent is discharged year-round to the Jones Slough directly to the north of the treatment facility. Sludge that is produced is stored on-site until it is land applied.

Upgrades for headworks, biological phosphorus removal, and sludge storage were completed in 2022. The annual average design flow recognized by the Department remains at 0.042 MGD even though the approved plans and specifications (letter from the Department dated March 4, 2021) listed a decreased annual average flow of 0.031 MGD. This is because a design report was not submitted, and the new flows do not meet the plan review requirements for flow projections.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations
The current permit, which expired on June 30, 2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5			45 mg/L	30 mg/L		2
TSS			45 mg/L	30 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Ammonia Nitrogen						1
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean		3
Chloride						1
Phosphorus Interim Interim Final				 9.0 mg/L 1.0 mg/L 0.225 mg/L	 0.075 mg/L 0.026 lb/day	4
Copper, Total Recoverable						1,5
Acute WET						6

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
4. A multi-discharger variance was in effect. The interim limit of 1.0 mg/L became effective July 1, 2022.
5. Blue River previously had a limit for copper. However, after a thorough cleaning of sampling equipment and additional sampling, reasonable potential was no longer shown, and the limit was removed.
6. Two acute WET tests were required during the permit term.

Receiving Water Information

- Name: Jones Slough
- Waterbody Identification Code (WBIC): 1210900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: Jones Slough is identified as a lake in some Department resources. However, lake characteristics seem to be exhibited in the upstream portion of Jones Slough, prior to the confluence of the Blue River. The water chemistry at the outfall location is expected to be heavily influenced by the water chemistry in the Blue River. The following 7-Q_{10} was obtained from USGS. The 7-Q2 is assumed equal to the 7-Q_{10} because only a single estimate at this location is available. The following flows were used in the previous evaluations and are believed to be appropriate for the discharge location.

  7-Q_{10} = 52 cfs (cubic feet per second)
  7-Q_2 = 52 cfs
  90-Q_{10} = 44.2
  Harmonic Mean Flow = 100.6 cfs using a drainage area of 193 mi^2
  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 184 mg/L as $CaCO_3$. This value represents the geometric mean of data (n=3) collected in 2015 stored in the Surface Water Integrated Monitoring System (SWIMS) database for Jones Slough.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Wisconsin River below the power plant dam in the Wisconsin Dells (SWIMS ID: 573052) because there is no data available for Jones Slough. The Wisconsin River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None.
- Impaired water status: Jones Slough, at the outfall location, has not been assessed for impairment. However, the Blue River, located approximately one mile upstream of Outfall 001 is 303(d) listed as

impaired for total phosphorus. The Wisconsin River, located approximately two miles downstream of Outfall 001, is 303(d) listed as impaired for PCBs.

Effluent Information

- Flow rate:
  Design annual average = 0.042 MGD (Million Gallons per Day)
  The annual average design flow recognized by the Department remains at 0.042 MGD even though the approved plans and specifications (letter from the Department dated March 4, 2021) listed a decreased annual average flow of 0.031 MGD.
  For reference, the actual average flow from July 2018 through July 2023 was 0.016 MGD.
- Hardness = 282 mg/L as $CaCO_3$. This value represents the geometric mean of data (n=4) from July and August 2022 reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.
- Additives: None.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus hardness. The permit required ammonia nitrogen, chloride, and copper monitoring during the current permit term.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Chloride and Copper Effluent Data

	Chloride (mg/L)	Copper (µg/L)
1-day P_{99}	279	70
4-day P_{99}	241	40
30-day P_{99}	219	25
Mean	208	18
Std	27	14
Sample size	48	33
Range	155 - 275	5 - 74
Sampling date range	Feb 2021 – Dec 2021	Aug 2018 – Apr 2023

The following table presents the average concentrations and loadings at Outfall 001 from July 2018 through July 2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement
BOD_5	6 mg/L
TSS	5 mg/L
pH field	7.1 s.u.
Phosphorus	5.15 mg/L
Ammonia Nitrogen	0.52 mg/L

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Blue River Wastewater Treatment Facility, and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 41.6 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	679.6	135.9	<1.1		
Cadmium	282	33.9	67.8	13.6	<0.19		
Chromium	282	4220	8440.7	1688	<1.1		
Copper	282	41.3	82.7			70	74
Lead	282	292	583.2	116.6	<4.3		
Nickel	268	1080	2160.6	432	<1.2		
Zinc	282	298	597.0	119.4	42		
Chloride (mg/L)		757	1514.0			279	275

* The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 13 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152.2	0.777	30444	6088.7	<1.1	
Cadmium	175	3.82	0.006	766.79	153.4	<0.19	
Chromium	184	217.65	0.412	43675	8735.0	<1.1	
Copper	184	17.44	0.761	3354.0			40
Lead	184	50.47	0.075	10131.7	2026.3	<4.3	
Nickel	184	87.42	1.19	17338	3467.6	<1.2	
Zinc	184	205.14	0.432	41156	8231.2	42	
Chloride (mg/L)		395	14.4	76532			241

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 25.1 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.006	143533	28706.6	<0.19
Chromium (+3)	3818000	0.412	1481127000	296225400	<1.1
Lead	140	0.075	54282	10856.3	<4.3
Nickel	43000	1.19	16680648	3336130	<1.2

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Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 25.1 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	0.777	4858.9	971.77	<1.1

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, **no effluent limitations are required.**

Copper – Considering available effluent data from the current permit term (August 2018 through April 2023), the 1-day P_{99} concentration is 70 µg/L, with a maximum concentration of 74 µg/L. Blue River Wastewater Treatment Facility previously had a limit for copper. However, after a thorough cleaning of sampling equipment and additional sampling, reasonable potential was no longer shown, and the limit was removed. **It is recommended monthly monitoring be completed during the fourth year of the permit term to ensure a minimum of 11 sample results are available at the next permit issuance.**

Chloride – Considering available effluent data from the current permit term (February 2021 through December 2021), the 1-day P_{99} chloride concentration is 279 mg/L, and the 4-day P_{99} of effluent data is 241 mg/L. These effluent concentrations are below the calculated WQBELs for chloride; therefore, **no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance** to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Mercury – The permit application did not require monitoring for mercury because the Blue River Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from July 2018 through September 2022 (n=5) was 3.93 mg/kg, with a maximum reported concentration of 7.75 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, the effluent flow rate, and lack of indirect dischargers, **PFOS and PFOA monitoring is not recommended.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Attachment #1

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 530 sample results were reported from July 2018 through July 2023. The maximum reported value was 7.9 s.u. (Standard pH Units). The effluent pH was 7.8 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.7 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.7 s.u. Therefore, a value of 7.8 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.8 s.u. into the equation above yields an ATC = 12 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code, daily maximum ammonia limitations are calculated using the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	24
1-Q_{10}	7757

The 2×ATC method yields the most stringent limits for Blue River Wastewater Treatment Facility.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	108	$7.0 < pH \leq 7.1$	66	$8.0 < pH \leq 8.1$	14
$6.1 < pH \leq 6.2$	106	$7.1 < pH \leq 7.2$	59	$8.1 < pH \leq 8.2$	11
$6.2 < pH \leq 6.3$	104	$7.2 < pH \leq 7.3$	52	$8.2 < pH \leq 8.3$	9.4
$6.3 < pH \leq 6.4$	101	$7.3 < pH \leq 7.4$	46	$8.3 < pH \leq 8.4$	7.8
$6.4 < pH \leq 6.5$	98	$7.4 < pH \leq 7.5$	40	$8.4 < pH \leq 8.5$	6.4
$6.5 < pH \leq 6.6$	94	$7.5 < pH \leq 7.6$	34	$8.5 < pH \leq 8.6$	5.3
$6.6 < pH \leq 6.7$	89	$7.6 < pH \leq 7.7$	29	$8.6 < pH \leq 8.7$	4.4
$6.7 < pH \leq 6.8$	84	$7.7 < pH \leq 7.8$	24	$8.7 < pH \leq 8.8$	3.7
$6.8 < pH \leq 6.9$	78	$7.8 < pH \leq 7.9$	20	$8.8 < pH \leq 8.9$	3.1
$6.9 < pH \leq 7.0$	72	$7.9 < pH \leq 8.0$	17	$8.9 < pH \leq 9.0$	2.6

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
Due to the available dilution in the receiving water, calculated weekly and monthly limits are much greater than the maximum effluent concentration of 26.28 mg/L (the lowest calculated weekly or monthly limit being 991 mg/L) and are therefore not considered further.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from January 2021 through December 2021, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Blue River Wastewater Treatment Facility permit. That need is determined by calculating 99th upper percentile (or P_{99}) values for ammonia and comparing the daily maximum values to the daily maximum limit.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	7.04
4-day P_{99}	5.55
30-day P_{99}	2.72
Mean*	0.52
Std	3.07
Sample size	104
Range	0.04 - 26.28

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. It should be noted that one value (26.28 mg/L) is higher than the calculated daily maximum limit (24 mg/L), but the two highest data points (26.28 mg/L and 17.14 mg/L that occurred in August 2021) out of 104 samples appear to be outliers since the next highest value was

3.27 mg/L. **Therefore, no limits are needed, but monitoring is recommended in the fourth year of the permit term.**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Codes, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Since Blue River Wastewater Treatment Facility's permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
Blue River Wastewater Treatment Facility has monitored effluent *E. coli* from August 2022 through July 2023 and a total of 19 results are available. A geometric mean of 126 counts/100 mL was not exceeded, with a maximum monthly geometric mean of 9.3 counts/100 mL. No effluent data exceeded 410 counts/100 mL. The maximum reported value was 200 counts/100 mL. Based on this effluent data, it appears that **the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Since Blue River Wastewater Treatment Facility does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than/greater than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore **no technology-based limit is required.**

Attachment #1

Annual Average Mass Total Phosphorus Loading

Month	Average Phosphorus Concentration (mg/L)	Total Effluent Flow (Million Gallons)	Calculated Mass (lbs/month)
August 2022	6.27	0.456	24
September 2022	3.51	0.413	12
October 2022	0.74	0.494	3.0
November 2022	3.00	0.520	13
December 2022	1.02	0.617	5.2
January 2023	0.24	0.826	1.7
February 2023	0.20	1.076	1.8
March 2023	0.25	1.022	2.2
April 2023	0.72	0.649	3.9
May 2023	5.06	0.466	20
June 2023	10.11	0.372	31
July 2023	8.37	0.411	29
Average			**12**

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MGD) for that month

In addition, the need for a WQBEL for phosphorus must be considered.

Water Quality-Based Effluent Limits (WQBEL)

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for Jones Slough.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\ Qe) - (Qs-f\ Qe)\ (Cs)]/Qe$$

Where:

WQC = 0.075 mg/L for Jones Slough.
Qs = 100% of the 7-Q_2 of 52 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.042 MGD = 0.065 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR

102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.145 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. No new data were available for consideration in estimating the background phosphorus concentration at the discharge location. New data is available for Jones Slough – Jones Lake, but the sampling location is upstream of the confluence of the Blue River and it is therefore not considered representative of the discharge location.

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

The facility may opt to sample the receiving water upstream of the outfall and after the confluence of the Blue River to assess the availability of assimilative capacity. The WQBELs may be amended if background phosphorus stream data, collected during the period of May – October and with regards to other stipulations laid out in s. NR 217.13(2)(d), Wis. Adm. Code, is submitted to the department that shows the upstream concentration of total phosphorus is in fact less than the applicable criterion. For informational purposes only, the following table shows a range of limits based on possible background concentrations. This calculation is based on effluent flow 0.042 MGD and stream flow (7-Q_2) of 52 cfs at the criterion of 0.075 mg/L in accordance with s. NR 217.13(2), Wis. Adm. Code.

Total Phosphorus Background Concentrations & Limits

Upstream 'Concentrations' mg/L	Corresponding P Limit mg/L
0.065	8.1
0.070	4.1
> = 0.075	0.075

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from July 2018 through July 2023.

Total Phosphorus Effluent Data

	Phosphorus mg/L
1-day P_{99}	13.18
4-day P_{99}	8.60
30-day P_{99}	6.26
Mean	5.15
Std	2.42
Sample size	529
Range	0.1 - 13.58

Reasonable Potential Determination
The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBEL**.** Therefore, **a WQBEL is required.**

Limit Expression
According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is upstream of an exceptional resource water (the Wisconsin River, located approximately two miles downstream of Outfall 001). **This final mass limit shall be 0.075 mg/L × 8.34 × 0.042 MGD = 0.026 lb/day expressed as a six-month average.**

Water Quality Trading
Blue River Wastewater Treatment Facility has submitted a water quality trading plan in order to comply with the effluent limitations for total phosphorus. Review of this plan will be addressed in a separate document. **A minimum level of control of 1.0 mg/L, consistent with what is already in effect, is required.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120°F (s. NR 106.55(6)(a), Wis. Adm. Code). At temperatures above ~103°F, conventional biological treatment systems stop functioning properly and experience upsets. There is no indication that this has ever occurred at this treatment system. This information, coupled with the lack of significant industrial heat load, lead to the conclusion that there is no reasonable potential for the discharge to exceed the 120°F limitation. Therefore, **no limits or monitoring are recommended**.

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional

judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1. For the Blue River Wastewater Treatment Facility, that ratio is approximately 800:1. With this amount of dilution, there is believed to be little potential for chronic toxicity effects in the Jones Slough associated with the discharge from the Blue River Wastewater Treatment Facility, **so the need for chronic WET testing will not be considered further.**

- Shown on the next page is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %			
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?
06/30/2020	>100	>100	Pass	Yes
07/06/2022	>100	>100	Pass	Yes

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TU_a and TU_c effluent values are equal to zero whenever toxicity is not detected (i.e., when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

  Acute Reasonable Potential = $0 < 1.0$, **reasonable potential is not shown, and a limit is not required.**

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table

below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

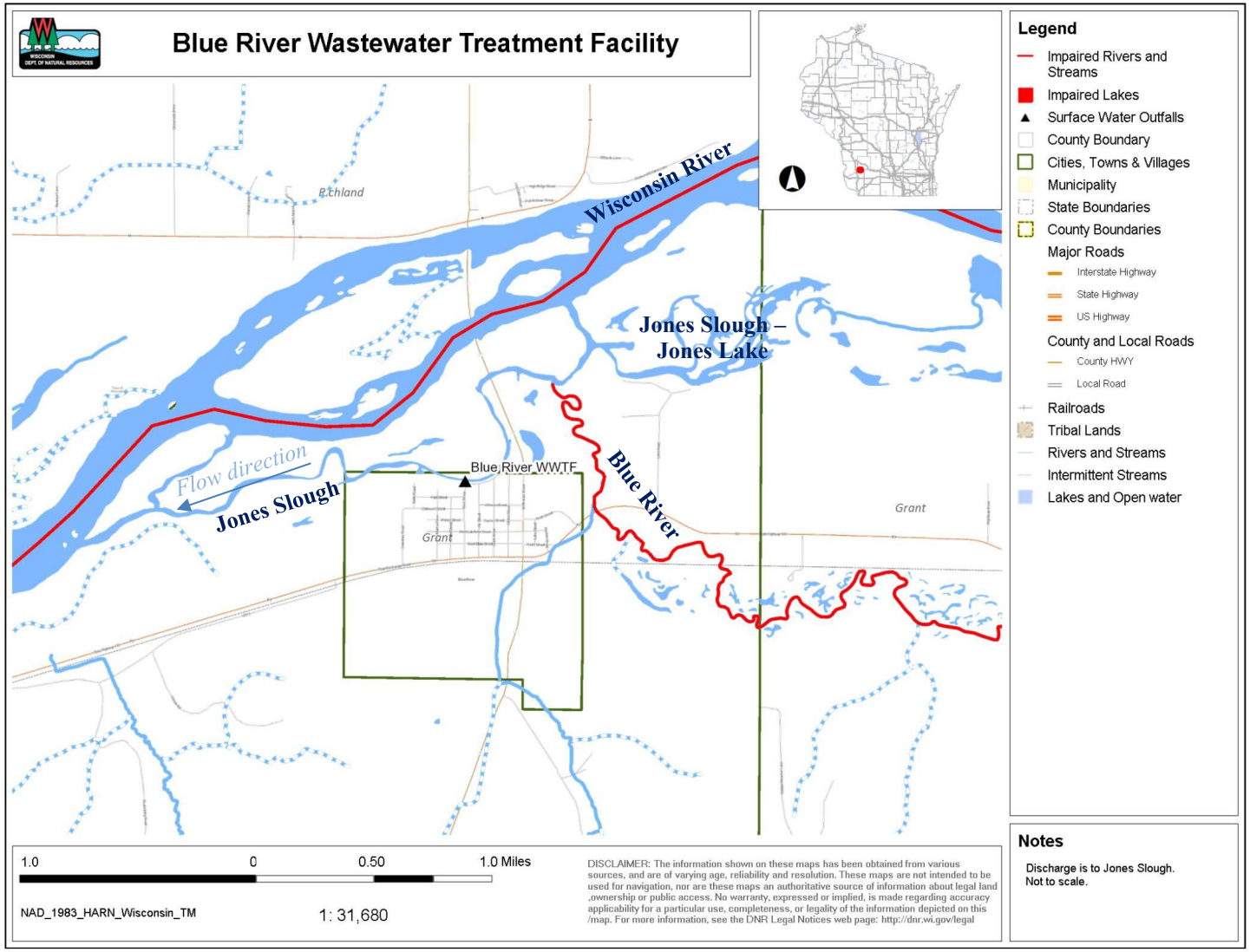
WET Checklist Summary

	Acute
AMZ/IWC	Not Applicable. **0 Points**
Historical Data	2 tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, few violations except for phosphorus, no upsets, consistent WWTF operations. **0 Points**
Receiving Water Classification	WWSF **5 Points**
Chemical-Specific Data	No limits based on ATC. Ammonia, chloride, copper, and zinc detected. Additional Compounds of Concern: None. **3 Points**
Additives	No additives used. **0 Points**
Discharge Category	No industrial contributors. **0 Points**
Wastewater Treatment	Secondary or better. **0 Points**
Downstream Impacts	No impacts known. **0 Points**
Total Checklist Points:	**8 Points**
Recommended Monitoring Frequency (from Checklist):	None.
Limit Required?	No
TRE Recommended? (from Checklist)	No

- **No WET testing is required** because information related to the discharge indicates the potential for effluent toxicity is believed to be low.

Attachment #2

Site Map



State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg, WI 53711

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

December 19, 2023

Sheila Sperry
201 Clinton St
Blue River, WI 53518

Subject: Blue River Wastewater Treatment Facility - WPDES Permit WI-0023418
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Mr. Fure:

The Department recently received a water quality trading plan (WQT Plan) for ongoing compliance with phosphorus effluent limits at the Blue River Wastewater Treatment Facility. The plan was received in May of 2023 and an updated version was received in December of 2023. Based on WDNR review, the final WQT Plan (dated December 2023) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes utilizing grading and/or riprap for stabilization of oxbow chutes. Construction of practices was completed in April and May of 2023.Credits generated from approved practices result in available credit quantities shown in Table 1. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limits beginning April 1, 2024.

Table 1: Total Phosphorus Credits Available per WQT-2023-0009

Year	Available Credits (lbs/yr) – Total
2024	50.5
2025	50.5
2026	50.5
2027	50.5
2028	50.5

The Department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The Department has assigned the WQT plan a tracking number of WQT-2023-0009 and will be referenced as such in the draft WPDES permit. The final WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring for total phosphorus. Please note that annual trading reports will need to include photographic documentation of the implemented practices, as requested in DNR comments on the draft WQT plan dated 7/25/2023.

If you have any questions or comments, please contact me at 608-419-4155 or at betsyjo.howe@wisconsn.gov

Thank you,

BetsyJo Howe

BetsyJo Howe
Wastewater Specialist
Wisconsin Department of Natural Resources

e-CC:

Jared Roen, Operator
Jordan Fure, P.E., Delta 3 Engineering
Matt Claucherty, WDNR
Caitlin Oconnell, WDNR

WATER QUALITY TRADING PLAN

May 8, 2023
Revised: December 1, 2023

Village of Blue River
Wastewater Treatment Facility

WPDES Permit No. WI-0023418
607 West Street
Blue River, Wisconsin 53518

Prepared by:

Delta 3 Engineering, Inc.

875 S Chestnut St. | Platteville, WI 53818
Phone: (608) 348-5355
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DELTA 3
EVERY ANGLE COVERED

Project Number: D21-071

TABLE OF CONTENTS

Attachments

I. Executive Summary -

This Water Quality Trading Plan summarizes the Village of Blue River's (Village) 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 0023418-09-0. The WQT Credit generation will include nonpoint source reduction of Total Phosphorus (TP) as modeled by the NRCS Streambank Erosion Estimator. Credits are then applied to the daily monitoring reports to demonstrate compliance. The WWTF plans to utilize biological phosphorus removal (BPR) and offset TP with WQT Credits in order to meet the final seasonal average limit of 0.075 mg/L is required to offset, which will become effective June 30, 2023.

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 50.5 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

Property Owner	Site	Current Phosphorus Loading (lbs/yr)	Proposed Phosphorus Loading (lbs/yr)	Proposed Phosphorus Reductions (lbs/yr)	Trade Ratio[1]	Proposed Phosphorus Credits
East Ridge Farm, LLC	Chute 1 Right	4.8	0	4.8	2:1	2.4
	Chute 1 Left	4.8	0	4.8	2:1	2.4
	Chute 2 Right	7.5	0	7.5	2:1	3.7
	Chute 2 Left	7.5	0	7.5	2:1	3.7
	Chute 3 Right	9.6	0	9.6	2:1	4.8
	Chute 3 Left	9.6	0	9.6	2:1	4.8
	Chute 4 Right	15.2	0	15.2	2:1	7.6
	Chute 4 Left	15.2	0	15.2	2:1	7.6
	Chute 5 Right	2.9	0	2.9	2:1	1.4
	Chute 5 Left	2.9	0	2.9	2:1	1.4
	Chute 6 Right	5.4	0	5.4	2:1	2.7
	Chute 6 Left	5.4	0	5.4	2:1	2.7
	Chute 7 Right	1.3	0	1.3	2:1	0.6
	Chute 7 Left	1.3	0	1.3	2:1	0.6
	Chute 8 Right	3.9	0	3.9	2:1	2.0
	Chute 8 Left	3.9	0	3.9	2:1	2.0
					Total	**50.5**

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)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty: = *Streambank Stabilization with Habitat Restoration* = 2

II. Background -

The purpose of this Water Quality Trading Plan (Plan) is to describe the Village's use of Water Quality Trading to comply with the total phosphorus limits as provided in the Village's WPDES Permit #WI-0023418-09-0. The Plan was developed following the Notice of Intent to Conduct Water Quality Trading, provided in Attachment #1, dated November 8, 2022. The Water Quality Trading Checklist Form 3400-208 is provided in Attachment #2.

The Village of Blue River is located in the northern portion of Grant County on State Trunk Highway "133" in southwest Wisconsin. The Village owns, operates, and maintains a Wastewater Treatment Facility (WWTF) which serves a population of approximately 434 residents.

The Village is comprised mostly of residential development and is positioned along the Wisconsin River. The Village has gentle slopes with grades ranging from 1% to 3% throughout the area. Elevations in the area range from approximately 671'± at the Wastewater Treatment Facility (WWTF) to 680'± at the Fire Station, which is located on the southern edge of the Village. The 100-year regional flood elevation for the Village of Blue River's WWTF site is at USGS Elevation = 668.00'. The location of the WWTF is provided in Attachment #3.

The existing sanitary sewer collection consists of approximately 73 sanitary manholes and 17,540 feet of eight-inch (8") sanitary sewer. One (1) lift station is utilized throughout the system along with approximately 110 feet of four-inch (4") sanitary force main to assist with the delivery of wastewater sewer collection system components. The gravity sanitary sewer main is typically composed of PVC. The manholes are primarily precast structures. Please refer to Attachment #4 – Sanitary Sewer Map for location of sanitary sewer collection system components.

The Village of Blue River owns and operates a WWTF that utilizes an extended-aeration, activated sludge treatment process. The facility currently discharges approximately 16,000 gallons per day (GPD) and has a design flow of 31,000 GPD (0.031 MGD). Primary treatment of the wastewater at the headworks of the facility consists of a mechanical screen. Wastewater then proceeds to the fermentation tank and anaerobic tank for selection of biological phosphorus removal. Following the anaerobic tank, wastewater enters the aeration tank for processing the influent flow and discharges into a rectangular final clarifier. The facility effluent passes through an ultraviolet (UV) system for disinfection prior to effluent discharge to the Blue River. The return activated sludge (RAS) from the clarifier is returned to the anaerobic tank for continued treatment, and the waste activated sludge (WAS) is pumped via air lift from the final clarifier into an aerobic digester for further sludge stabilization. Sludge is then transferred to an anaerobic sludge storage tank for on-site storage prior to landspreading on DNR approved sites. No chemicals are used at the WWTF for the removal of Phosphorus. Please see Attachment #5 for the WWTF flow schematic. The Village of Blue River's WWTF has one (1) receiving water and effluent discharge location, Outfall 001: Blue River (Blue River Watershed, LW09 – Lower Wisconsin River Basin).

The monthly average influent and effluent flows and loadings at the WWTF for 2020, 2021, and 2022 are provided in Table 2.1, Table 2.2, Table 2.3 respectively.

Table 2.1 – 2020 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. (’20)	0.017	291	2	191	3	-	5.20	0.74
Feb. (’20)	0.017	256	2	173	3	-	5.30	0.75
Mar. (’20)	0.020	213	2	125	3	-	4.67	0.78
Apr. (’20)	0.021	264	3	139	3	-	4.65	0.81
May (’20)	0.020	240	3	112	3	-	6.10	1.02
June (’20)	0.014	224	2	142	3	-	6.29	0.73
July (’20)	0.013	221	3	143	3	-	6.69	0.73
Aug. (’20)	0.014	188	4	137	4	-	7.73	0.90
Sept. (’20)	0.013	194	3	128	3	-	6.37	0.69
Oct. (’20)	0.015	175	2	140	2	-	5.89	0.74
Nov. (’20)	0.016	191	5	119	6	-	6.61	0.88
Dec. (’20)	0.017	241	5	142	3	-	5.18	0.73
Annual Average =	**0.016**	**225**	**3**	**141**	**3**	**-**	**5.89**	**0.79**

Table 2.2 – 2021 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. (’21)	0.017	312	3	169	3	-	4.88	0.69
Feb. (’21)	0.019	322	6	151	4	-	4.49	0.71
Mar. (’21)	0.015	278	3	119	3	-	5.17	0.65
Apr. (’21)	0.014	325	2	130	2	-	6.65	0.78
May (’21)	0.014	281	2	133	2	-	5.83	0.68
June (’21)	0.013	287	4	162	2	-	6.43	0.70
July (’21)	0.013	265	2	124	3	-	6.82	0.74
Aug. (’21)	0.014	221	2	128	3	-	9.28	1.08
Sept. (’21)	0.013	243	3	180	5	-	7.73	0.84
Oct. (’21)	0.014	176	3	117	3	-	6.64	0.78
Nov. (’21)	0.010	201	3	109	5	-	4.83	0.40
Dec. (’21)	0.009	286	5	132	8	-	4.94	0.37
Annual Average =	**0.014**	**266**	**3**	**137**	**4**	**-**	**6.14**	**0.72**

Table 2.3 – 2022 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. ('22)	0.012	287	7	135	9	-	4.84	0.48
Feb. ('22)	0.020	281	11	115	7	-	4.94	0.82
Mar. ('22)	0.019	327	17	142	15	-	5.49	0.87
Apr. ('22)	0.020	305	17	130	15	-	5.67	0.95
May ('22)	0.017	324	9	130	7	-	7.54	1.07
June ('22)	0.014	303	13	132	5	-	6.43	0.75
July ('22)	0.018	332	16	155	4	-	**0.63**	**0.09**
Aug. ('22)	0.015	295	11	147	4	-	6.27	0.78
Sept. ('22)	0.014	269	10	121	3	-	3.51	0.41
Oct. ('22)	0.016	282	5	143	3	-	**0.74**	**0.10**
Nov. ('22)	0.017	263	11	139	5	-	3.00	0.42
Dec. ('22)	0.020	256	12	146	7	-	1.01	0.17
Annual Average =	**0.016**	**294**	**12**	**136**	**7**	-	**4.17**	**0.57**

Possible sources of TP within the Municipality were evaluated to determine if Phosphorus was being significantly contributed and will continue its investigation of Phosphorus contributors:

1. New Design Salon
2. New Horizon Supply Coop

During the initial evaluation of sanitary dischargers, it was determined that the businesses were not major contributors of Phosphorus. Currently, the Village has been able to maintain an average Total Phosphorus effluent of 6.14 mg/L which is well within the WPDES interim limit of 9.0 mg/L. The Village will continue to investigate options for TP removal at the WWTF. Results following the BPR startup in July, 2022 have demonstrated that TP concentrations less than 1.0 mg/L are readily achievable.

The Village has investigated watershed compliance alternatives such as Water Quality Trading (WQT) and Adaptive Management (AM). Utilizing the results from PRESTO, the watershed of the WWTF has a nonpoint source ratio of 9:91 and is considered to be nonpoint-source dominated. No potential stream monitoring projects are planned for this watershed. As calculated in the Water Quality Based Effluent Limit (WQBEL) on November 5, 2015, the rolling median TP concentration was 0.145 mg/L. The median average was almost double the applicable Water Quality Standard (WQS) of 0.075 mg/L. The Blue River is listed as an impaired river for Total Phosphorus on the DNR 2022 Impaired Waters List. The Village intends to perform WQT projects within the Village's Hydrological Unit Code – 12 (HUC-12) watershed #070700051407 as provided in Attachment #6.

Water Quality Trading may be used by municipal WPDES permit holders to demonstrate compliance with water quality-based effluent limitations (WQBELs). Generally, trading would involve the Village compensating another party to implement best management practices (BMPs) that would reduce Phosphorus runoff within the Blue River watershed. The Phosphorus runoff is modeled to demonstrate Phosphorus Credits generated by the BMPs. Through an agreement between the Village and other party, Phosphorus Credits generated by the other party are used by the Village to offset Phosphorus discharged at the WWTF.

Required TP Credits can be calculated by subtracting the average pounds discharged by the average pounds allowed by the seasonal limit. Based on results from 2022, the BPR process is capable to reducing TP to less than 1.0 mg/L. Flow and loading data from 2022 were utilized to determine credits needed. Calculations for required WQT reductions are provided below.

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

Seasonal Average Daily Flow (Q) = 0.016 MGD
Average Phosphorus concentration = 1.00 mg/L

1.00 mg/L x 0.016 MGD x 8.34 x 365 days/yr. = **49 lbs./yr.**

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

Seasonal Average Daily Flow (Q) = 0.016 MGD
Proposed Seasonal Phosphorus Concentration Limit = 0.075 mg/L

0.075 mg/L x 0.016 MGD x 8.34 x 365 days/yr. = **4 lbs./yr.**

3) Reduction of Total Phosphorus required at WWTF -
49 lbs./yr. – 4 lbs./yr. = **45 lbs./yr.**

In 2022, the Village of Blue River would have been required to generate over 45 TP Credits. The guidelines for WQT require that a trade result in water quality improvement at a Non-Point Source (NPS) providing credits to the WWTF (Point Source (PS)). Methods, formulas, and trade ratios are dependent on type of land and improvements being completed for the NPS reduction. For estimation purposes, a 2:1 final trade ratio was used. (Example: 2 pounds of load reduction generated for each long-term credit available.) Utilizing 2:1 trade ratio listed above, the required NPS Phosphorus reduction would be 90 lbs./year.

To demonstrate compliance through WQT, the Village intends to perform stabilization of oxbow chutes. The Village intends to generate additional credits as a factor of safety and for future growth.

III. Location and Description of Credit Generation Sites –

The Village discharges to the Blue River (Blue River Watershed, LW09 – Lower Wisconsin River Basin) at Outfall 001. As mentioned previously, the Village intends to perform WQT projects within the Village's HUC-12 #070700051407. The Village plans to perform stabilization of oxbow chutes which will utilize grading and/or riprap to prevent erosion of sediment from the oxbow chutes. Projects will occur on privately owned property. Stabilization of oxbow chutes will not only prevent sediment from entering the steam, but will also prevent phosphorus, nitrogen, and other pollutants from discharging to the Blue River. Reducing pollutant discharge will restore stream habitat and generate water quality trading credits. 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 Plan identifies stabilization of oxbow chutes practices that will reduce TP runoff from nonpoint sources.

A. Methods Used to Generate Load Reductions

For stabilization of oxbow chutes, the Village has the ability to generate TP load reductions through grading and/or riprapping of eight (8) chutes for a total of approximately 800 lineal feet.

Stabilization will be performed as per NR 328 *Shore Erosion Control Structures in Navigable Waterways and* NRCS 580 *Streambank and Shoreline Protection*. Shaping and riprapping will eliminate the discharge of sediment to the stream. The project will occur within HUC-12 #070700051407 in order to generate TP credits. Standard Plans and Specifications for the Project Site will be provided by Mike Engel, United States Fish & Wildlife Service (USFWS). The Property Owner will also acquire all required permits and authorizations for the Projects.

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

B. History of Project Site

Proposed stream improvements were developed based on the information provided in the Wisconsin DNR *Blue River Watershed (LW09)*. This report stated the following:

"A cursory habitat evaluation was done on a tributary to the Blue River in the summer of 2001. This survey found fair habitat and overall problems resulted from erosion and nonpoint source pollution from the watershed. The intensive agriculture in the watershed is a limiting factor. Barnyards and grazing may be causing in-stream habitat and water quality problems in the reach above the state fishery area. Eroding streambanks are also a problem in spots, and silt deposits in some pools and riffles are causing in-stream habitat problems."

Blue River Watershed has experienced agricultural development within the watershed and has issues caused by sedimentation. The watershed has also experienced reduction of large woody debris along the streambanks due to agricultural development which reduces available habitat and bank roughness. Watershed improvements will reduce sediment which was identified as a primary reason for habitat degradation in the Blue River Watershed.

The Project Sites are planned within the Blue River Watershed. The project location is on private property along the Blue River.

The Partners for Fish and Wildlife Program in partnership with Ducks Unlimited and the private landowner through a signed agreement (WIPLO-19-005) is designing, permitting, and implementing this restoration with cost share. The Project consists of enhancing and restoring degraded wetlands in the Blue River watershed. The privately owned land is used for recreation and agriculture. The 107 acre restoration/enhancement site current land use is grazing, hay, and crops when not too wet. Vegetation is dominated by invasive Reed canary grass. The goal is to increase habitat for migratory and resident wetland bird species. The restoration will filter and slowly release cleaner and cooler water through infiltration to the Blue River. A greater diversity of plant species will lead to richer amphibian and insect diversity.

This restoration will restore hydrology by disabling a drainage ditch. Water control devices will be installed to maximize wildlife habitat including moist soil management. Several berms across waterways (dams) will be created to increase surface water. The site will be seeded to a quick growing annual grass such as winter wheat, oats, or annual rye to stabilize soil. These areas will be followed with permanent vegetation cover to include enhanced pasture, prairie, and/or annual crops in the moist soil management unit.

The WQT project is to include Chutes / Graded Control Structures to reduce sedimentation and restore wetland function as part of the larger site plan. In consensus with USFWS and DNR, the erosion indicators demonstrate the lateral recession rate ranges from Moderate to Severe as per the NRCS Recession Rate Table. Therefore, the recession rate varied from 0.2 feet/year to 0.4 feet/year were determined on a case-by-case basis for modeling purposes.

Natural Heritage Inventory Data has no elemental occurrences for this site. There are four records (see attachment) that will not be impacted. Wisconsin Historic Preservation Database has no records for this site.

C. Trade Ratio

The Plan identifies trading practices that will reduce TP runoff. However, the DNR requires a trade ratio to provide a safety factor for meeting water quality standards. Trade ratios consider pollutant reductions of varying certainty, location, and type. For the given WQT practice, a trade ratio of 2:1 was calculated. The trade ratio is derived as follows:

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)
Equivalency = 0 (Not necessary of Total Phosphorus)
Uncertainty: *Streambank Stabilization with Habitat Restoration* = 2

Uncertainty factor was determined from Appendix H – Management Practices and Associated Information of the Wisconsin Department of Natural Resources *Guidance for*

implementing Water Quality Trading in WPDES Permits (Edition 2).

D. 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 4.1. If the Plan or model inputs change during construction, the Village will submit to the DNR the revised models and calculations to more accurately reflect and number of credits generated.

Table 4.1 – Modeling Results

Property Owner	Site	Current Phosphorus Loading (lbs/yr)	Proposed Phosphorus Loading (lbs/yr)	Proposed Phosphorus Reductions (lbs/yr)	Trade Ratio[1]	Proposed Phosphorus Credits
East Ridge Farm, LLC	Chute 1 Right	4.8	0	4.8	2:1	2.4
	Chute 1 Left	4.8	0	4.8	2:1	2.4
	Chute 2 Right	7.5	0	7.5	2:1	3.7
	Chute 2 Left	7.5	0	7.5	2:1	3.7
	Chute 3 Right	9.6	0	9.6	2:1	4.8
	Chute 3 Left	9.6	0	9.6	2:1	4.8
	Chute 4 Right	15.2	0	15.2	2:1	7.6
	Chute 4 Left	15.2	0	15.2	2:1	7.6
	Chute 5 Right	2.9	0	2.9	2:1	1.4
	Chute 5 Left	2.9	0	2.9	2:1	1.4
	Chute 6 Right	5.4	0	5.4	2:1	2.7
	Chute 6 Left	5.4	0	5.4	2:1	2.7
	Chute 7 Right	1.3	0	1.3	2:1	0.6
	Chute 7 Left	1.3	0	1.3	2:1	0.6
	Chute 8 Right	3.9	0	3.9	2:1	2.0
	Chute 8 Left	3.9	0	3.9	2:1	2.0
					Total	**50.5**

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)
Equivalency = 0 (Not necessary of Total Phosphorus)
Uncertainty: *Streambank Stabilization with Habitat Restoration* = 2

Soil testing has been completed to determine TP concentrations within the soil. Soil sampling was performed at each Chute location. Soil sampling included the use of a soil sampler which pulled ¾" 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 #7.

Chute cross sections were surveyed with global position system (GPS) equipment by USFWS. Chute heights were calculated as per guidance for the NRCS Streambank Erosion Estimator. An average height was determined for each Chute for input to the NRCS Streambank Erosion Estimator.

An onsite evaluation has been conducted to estimate bank recession rate. The bank has was also evaluated in the field by Mike Engel (USFWS). The data, narrative, and photos documenting the current state of eroding stream banks are provided in Attachment #8.

With the collected data, the NRCS Streambank Erosion Estimator was used to calculate TP loss from each reach of the eroding oxbow chute. The modeling data for the NRCS Streambank Erosion Estimator is available in Attachment #9. The grading and riprap design will eliminate bank recession thus eliminating TP inputs due to bank recession in riprap areas.

Additionally, in-stream habitat structures were designed by USFWS to incorporate habitat improvements with the Project Plans. These structures are intended to increase available cover for juvenile and adult fish. These structures will also influence stream hydrology by creating pools and riffles which are stream formations essential to macroinvertebrates, fish, and other aquatic life. The quantity and location of habitat structures is provided in Table 4.2 below.

Table 4.2 – Habitat Structures

Location	Root Wad
Chute 1	1
Chute 2	1
Chute 3	1
Chute 4	1
Chute 5	1
Chute 6	1
Chute 7	1
Chute 8	1
Total	**8**

E. Operation and Maintenance

An Operation and Maintenance (O&M) Plan is provided in Attachment #10. 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, Village is planning to perform stabilization of oxbow chutes by implementing BMPs. The stabilization practices will be installed and maintained per the United States Fish & Wildlife Service Plans and Specifications as provided in Attachment #11. BMPs are to follow NR 328 Shore Erosion Control Structures in

Navigable Waterways, NRCS 580 Streambank and Shoreline Protection, and NRCS 395 Stream Habitat Improvement and Management.

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 BMPs will be inspected following heavy rain events at a minimum. Inspection will be used to determine appropriate actions in order to maintain the BMPs for continuous and ongoing bank 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	Fall 2021 – Fall 2022
Construction of BMPs	April 1 - May 31, 2023
Phosphorus Credit Registration	June 30, 2023
Use of Phosphorus Credits by Village of Blue River (Ongoing for Permit Compliance)	June 30, 2023

Credits will be used by the Village beginning June 30, 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 Village will track credits used monthly. The Village 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 Village 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 Village 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 Village 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 Village 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 Village 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 Village 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 Village are not being generated as outlined in this Water Quality Trading Plan.

The Village will submit a written notification within five days after the Village 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 Village to submit the written notice with the next regularly scheduled monitoring report required by Village'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 Village 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 Village'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.

Village of Blue River Wastewater Treatment Facility

By: _____

Chad Williamson
Director of Public Works
Village of Blue River
607 West Street
Blue River, WI 53518
Telephone: (608) 485-0903
Email: brsp@mwt.net

Attachment #1

State of WisconsinDepartment of Natural Resources101 South Webster Street
Madison WI 53707-7921dnr.wi.gov

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (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	Facility Site Number
Village of Blue River	WI- 0023418-09-0	

Facility Address	City	State	ZIP Code
607 West Street	Blue River	WI	53518

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jordan Fure (Delta 3 Eng.)	875 South Chestnut Street	Platteville	WI	53818

Project Name: Blue River WWTF Upgrade

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Blue River	Total Phosphorus	070700051407

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

Credit Generator Information

Credit generator type (select all that apply):
- ☐ Permitted Discharge (non-MS4/CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☑ Urban nonpoint source discharge
- ☑ Agricultural nonpoint source discharge
- ☐ 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 [illegible])

Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure

Notice of Intent to Conduct Water Quality Trading

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

List the practices that will be used to generate credits:

The Village intends to perform streambank stabilization. The construction will occur upstream of Outfall 001.

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

Projected date credits will be available:

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
Jordan Fr...	10/1/2022

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
Chad Mullins	11/8/22

Attachment #2

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

Water Quality Trading Checklist

Form 3400-208 (1/14)

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	Permit Number	Facility Site Number
Village of Blue River	WI- 0023418	

Facility Address	City	State	ZIP Code
607 West Street	Blue River	WI	53518

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jordan Fure (Delta 3 Eng.)	875 South Chestnut Street	Platteville	WI	53818

Project Name
Proposed Stream Improvements

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Blue River	Total Phosphorus	070700051407

Credit Generator Information

Credit generator type (select all that apply):

- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ 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
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ 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	◯ Yes	◯ No	
b. Amount of credit being generated	◯ Yes	◯ No	
c. Timeline for credits and agreements	◯ Yes	◯ No	
d. Method for quantifying credits	◯ Yes	◯ No	
e. Tracking and verification procedures	◯ Yes	◯ No	
f. Location of credit generator in proximity to receiving water and credit user	◯ Yes	◯ No	
g. Other: ______________________	◯ Yes	◯ 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?
◯ Urban NPS ◯ Agricultural NPS ◯ Other	Streambank Stabilization	NRCS Streambank Erosion Estimator		◯ Yes ◉ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part

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

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	Section IV
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	Section VI
j. Reporting requirements should the management practice fail	◉ Yes	○ No	Section VI
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	Section IV
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	Section III
m. Practice registration documents, if available	○ Yes	◉ No	
n. History of project site(s)	◉ Yes	○ No	Section IV
o. Other: _____	○ Yes	○ 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	Date Signed
[signature]	5-8-2023

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
[signature]	5/8/2023

Attachment #3

Surface Water Data Viewer Map

Legend

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

Notes

0.5 0 0.25 0.5 Miles

NAD_1983_HARN_Wisconsin_TM

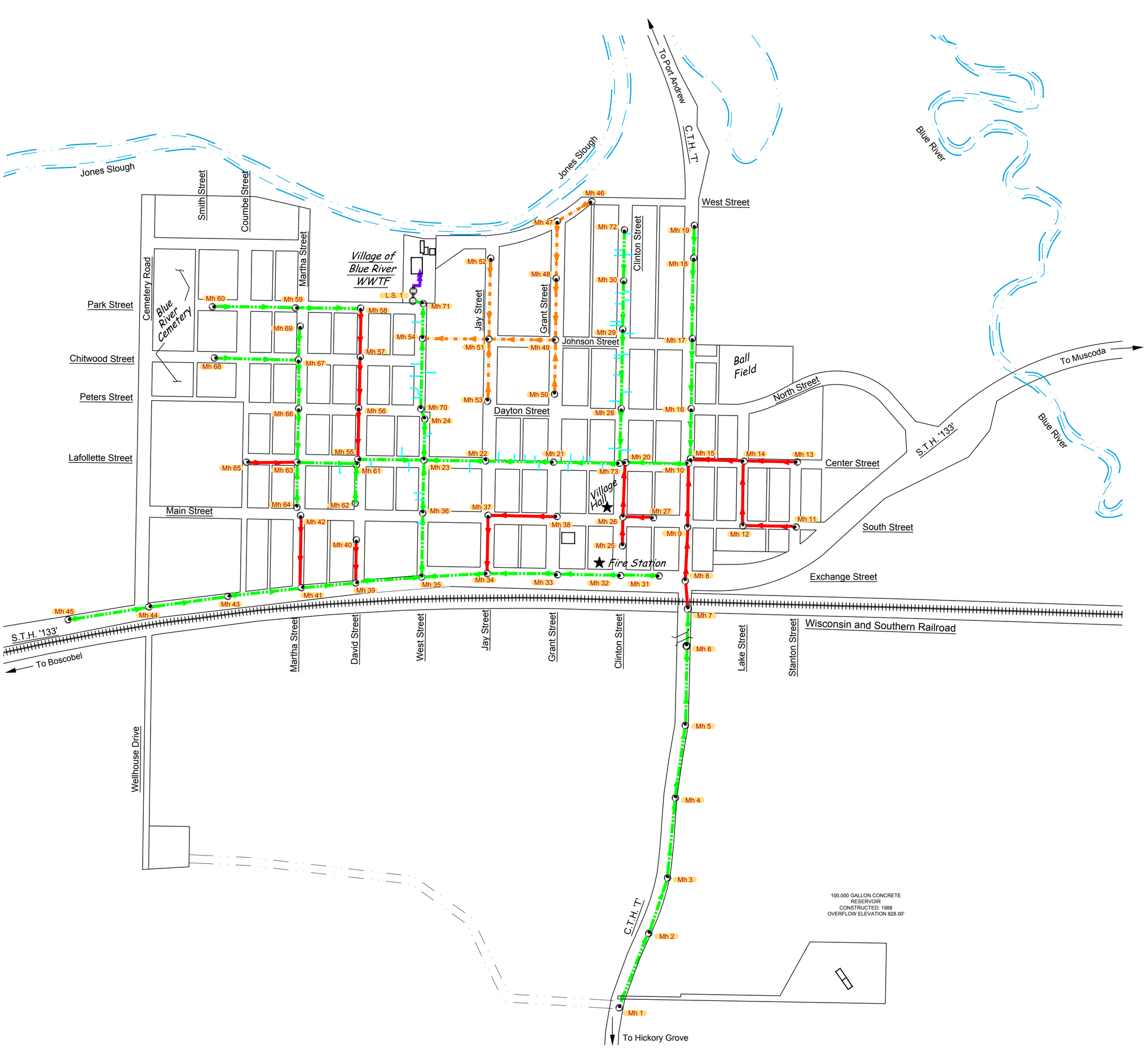
1: 15,840

Attachment #4

SANITARY SEWER SYSTEM MAP

VILLAGE OF BLUE RIVER

GRANT COUNTY, WI



Legend

Known Lateral Location

Existing 8" Sanitary Sewer - PVC

Existing 8" Sanitary Sewer - Truss Pipe

Existing 8" Sanitary Sewer - Clay

Existing 4"/6" Sanitary Force Main

Existing Flow Direction

Existing Sanitary Manhole

Lift Station

River/Stream

FIGURE 2-2

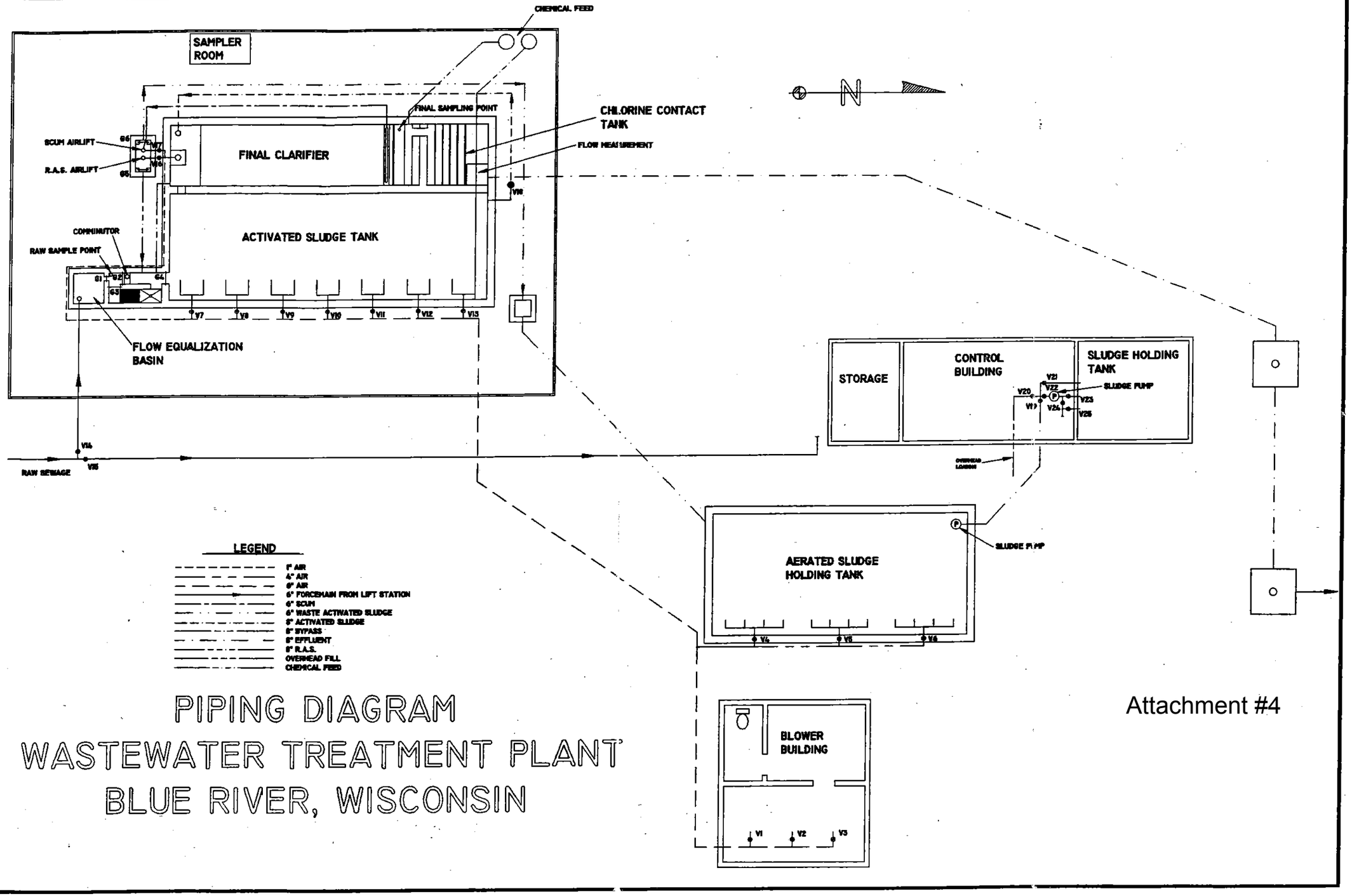
Drawn by: C.Coyier
Date: Jan 21, 2010

Revised by: C.Coyier
Date:Oct 21, 2015

DELTA 3 ENGINEERING INC
PROFESSIONAL CIVIL-MUNICIPAL & STRUCTURAL ENGINEERING • ARCHITECTURE
GRANT WRITING • LAND DEVELOPMENT • PLANNING & CADD SERVICES
875 SOUTH CHESTNUT STREET
PLATTEVILLE, WISCONSIN 53818
PHONE: (608) 348-5355
FAX: (608) 348-5455

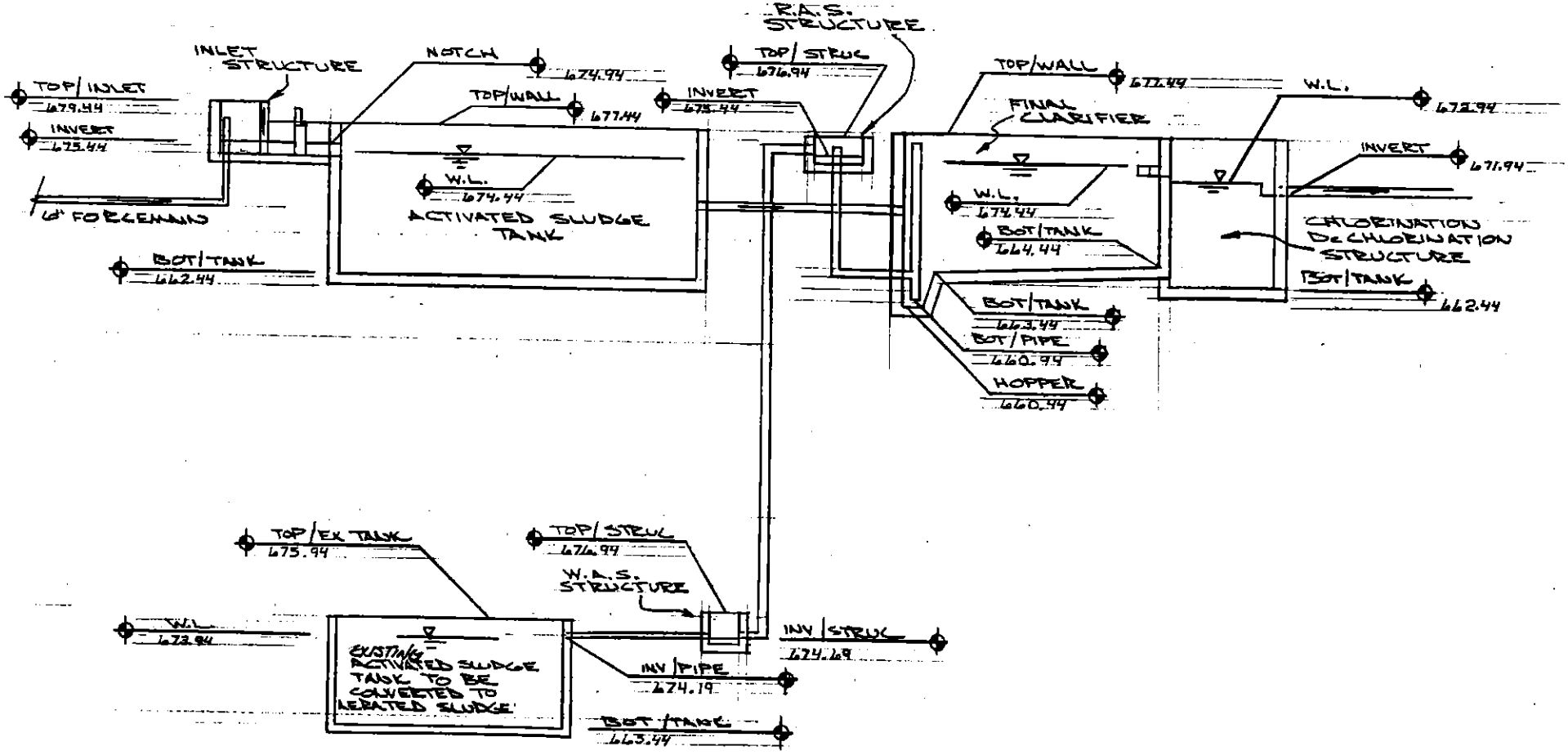
File: G:\Projects\Blue River\Maps\Utilities_Sanitary.dwg

Attachment #5



PIPING DIAGRAM
WASTEWATER TREATMENT PLANT
BLUE RIVER, WISCONSIN

Attachment #4



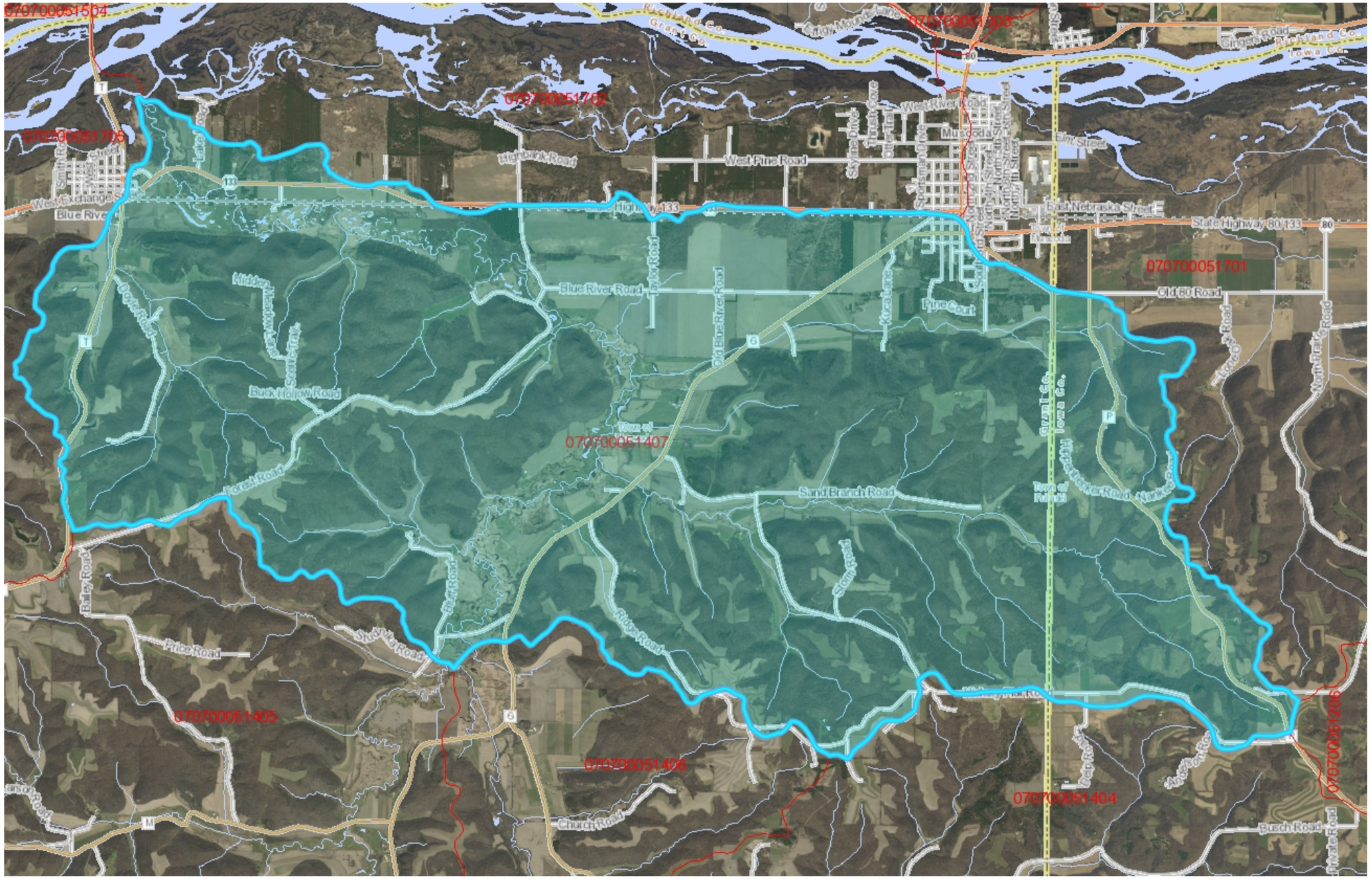
FLOW SCHEMATIC

N.T.S.

Attachment #4

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

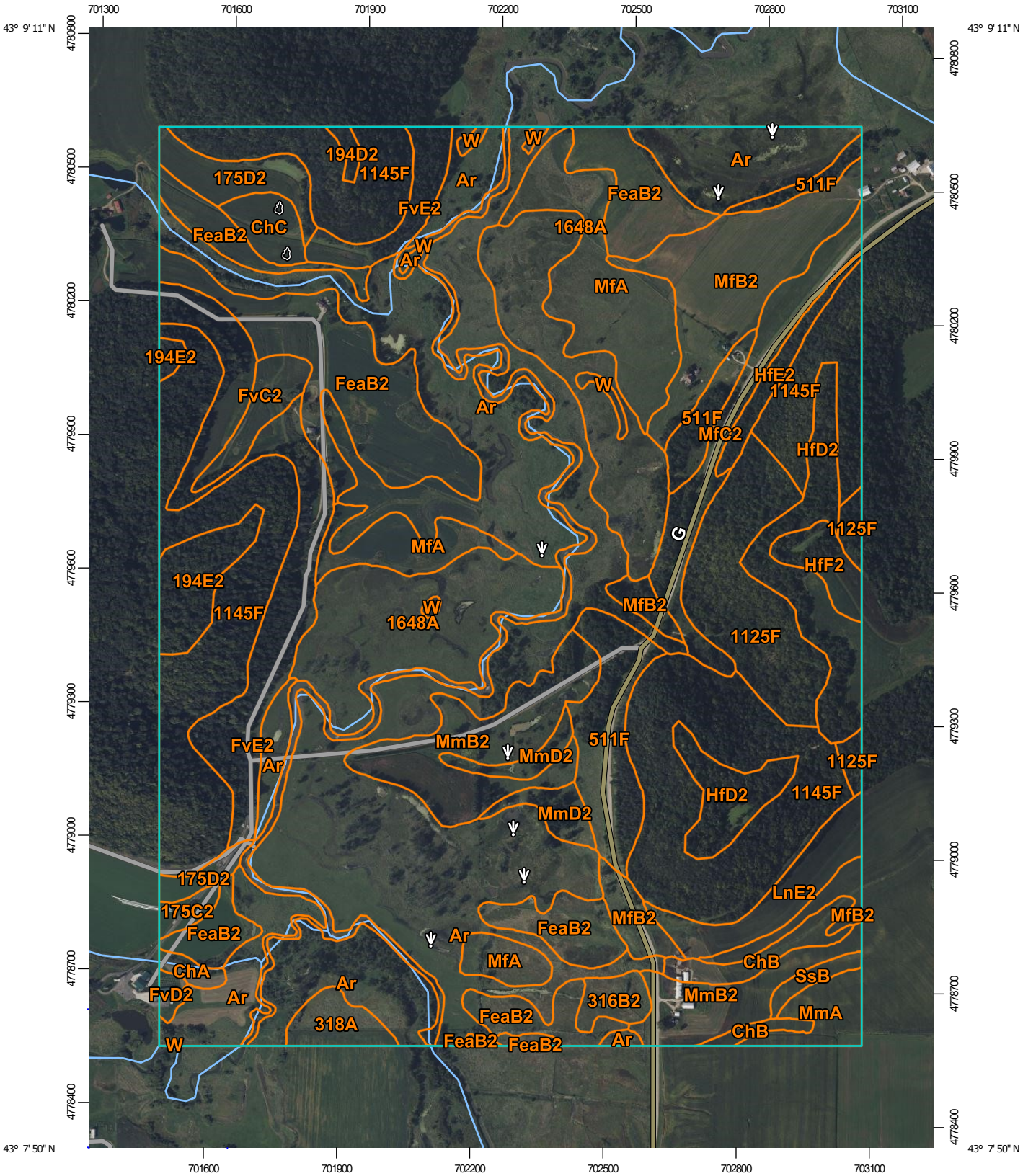
1.5 0 0.75 1.5 Miles

1:47,520

NAD_1983_HARN_Wisconsin_TM

Notes

Attachment #7



Map Scale: 1:12,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

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.

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 17, Sep 6, 2022

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

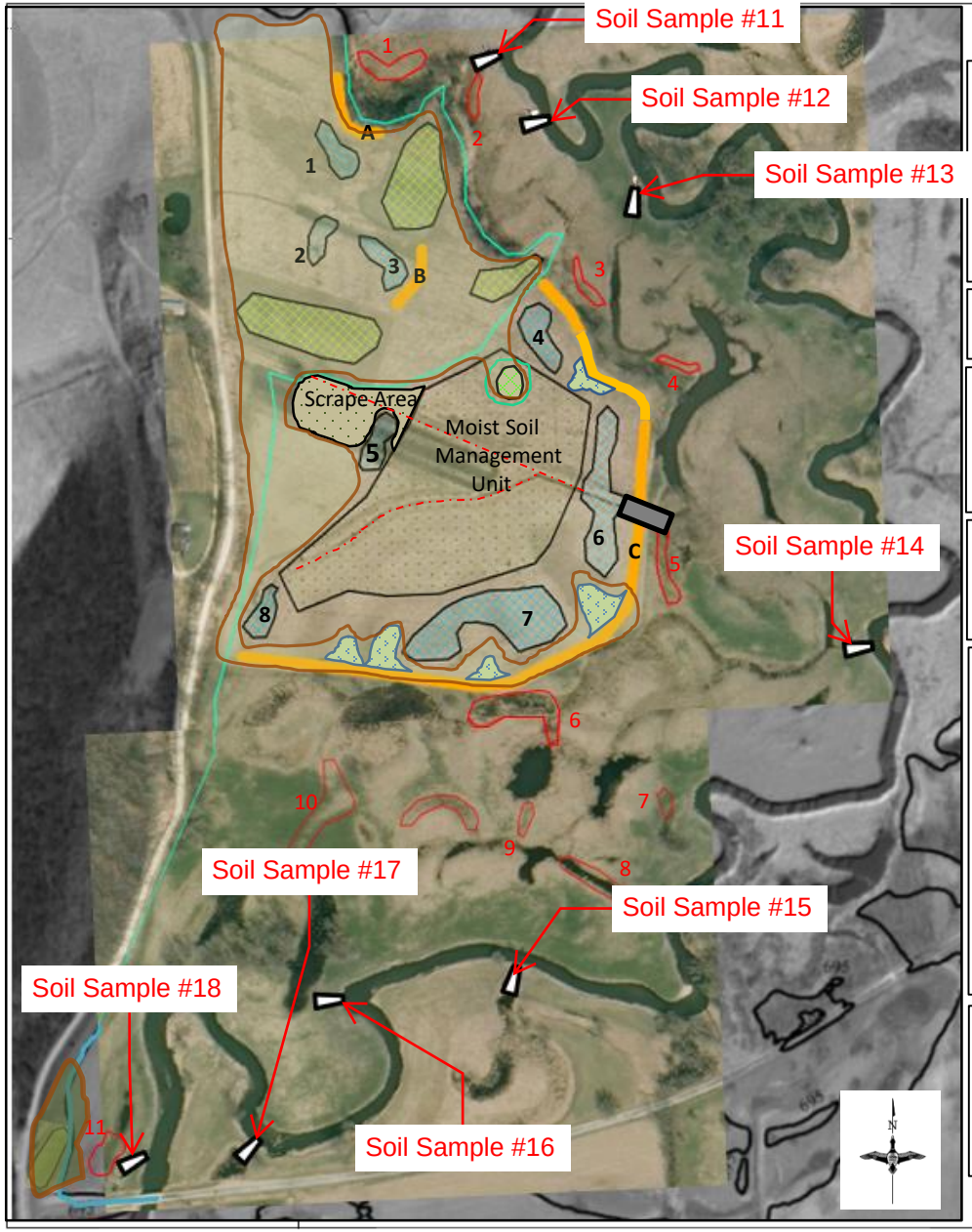
Date(s) aerial images were photographed: Aug 2, 2022—Sep 28, 2022

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
175C2	Palsgrove silt loam, 6 to 12 percent slopes, moderately eroded	2.2	0.3%
175D2	Palsgrove silt loam, 12 to 20 percent slopes, moderately eroded	10.9	1.3%
194D2	Newglarus silt loam, moderately deep, 12 to 20 percent slopes, moderately eroded	1.1	0.1%
194E2	Newglarus silt loam, moderately deep, 20 to 30 percent slopes, moderately eroded	10.6	1.3%
316B2	Ella silt loam, 1 to 6 percent slopes, moderately eroded	4.0	0.5%
318A	Bearpen silt loam, 0 to 3 percent slopes, rarely flooded	5.4	0.7%
511F	Plainfield sand, river valley, 15 to 60 percent slopes	24.7	3.1%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	29.3	3.6%
1145F	Gaphill-Rockbluff complex, 30 to 60 percent slopes	119.1	14.7%
1648A	Northbend-Ettrick silt loams, 0 to 3 percent slopes, frequently flooded	60.5	7.5%
Ar	Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded	197.5	24.4%
ChA	Chaseburg silt loam, moderately well drained, 0 to 2 percent slopes	1.8	0.2%
ChB	Chaseburg silt loam, moderately well drained, 2 to 6 percent slopes	7.2	0.9%
ChC	Chaseburg silt loam, 6 to 15 percent slopes	5.2	0.6%
FeaB2	Festina silt loam, 1 to 6 percent slopes, moderately eroded	68.6	8.5%
FvC2	Fayette silt loam, valleys, 6 to 12 percent slopes, moderately eroded	6.0	0.7%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FvD2	Fayette silt loam, valleys, 12 to 20 percent slopes, moderately eroded	1.3	0.2%
FvE2	Fayette silt loam, valleys, 20 to 30 percent slopes, moderately eroded	41.1	5.1%
HfD2	Hixton fine sandy loam, 10 to 15 percent slopes, moderately eroded	26.6	3.3%
HfE2	Hixton fine sandy loam, 15 to 20 percent slopes, moderately eroded	4.6	0.6%
HfF2	Hixton fine sandy loam, 20 to 30 percent slopes, moderately eroded	5.5	0.7%
LnE2	Lindstrom silt loam, 15 to 30 percent slopes, moderately eroded	11.2	1.4%
MfA	Meridian fine sandy loam, 0 to 2 percent slopes	38.7	4.8%
MfB2	Meridian fine sandy loam, 2 to 6 percent slopes, moderately eroded	38.9	4.8%
MfC2	Meridian fine sandy loam, 6 to 10 percent slopes, moderately eroded	17.4	2.2%
MmA	Meridian loam, 0 to 2 percent slopes	6.6	0.8%
MmB2	Meridian loam, 2 to 6 percent slopes, moderately eroded	35.5	4.4%
MmD2	Meridian loam, 10 to 15 percent slopes, moderately eroded	6.9	0.9%
SsB	Sparta loamy fine sand, 2 to 6 percent slopes	2.2	0.3%
W	Water	19.4	2.4%
Totals for Area of Interest		**809.9**	**100.0%**



Notes:

Material placed in the flood plain associated with berm C is less than material removed from the food plain associated with oxbow restoration 1,2,3,7,8,9,10, 11 and scrape 5 along with borrow from 4,6,7,8 above ground water level used in building berms and will result in increased flood storage (see page 3)

Oxbow scrapes will be located in areas dominated by reed canary grass

Micotopography work will accentuate existing topographic features by moving 4 inches or less in targeted areas. These areas will receive custom seed mixes to establish wet prairie.

Moist soil management unit will involve scraping (spoils moved out of flood plain), leveling, and tile installation for waterfowl and shorebird management.

Erosion Control Plan

Immediately after earth moving is complete the site will be seeded and planted where appropriate . Erosion control matting will be placed on areas where slopes are greater than 5:1. Mulch may be used in areas less than 5:1. Culverts leading to river will be monitored and straw bales placed if needed. All erosion control will be installed and maintained according to NRCS technical standards (see attached NRCS Standard 484).

Planting/Seeding Plan

Planting and seeding will be established in accordance to NRCS Wisconsin Agronomy Technical Note 5 (see attached). All disturbed areas will be seeded down to a native prairie mix (see Table 17, Tech Note 5). Seed mix may be altered due to seed availability but diversity should remain the same.

Legend

- Water Control Structure
- Borrow/Scrape
- Berm
- Approximate Flood Plain
- Spoil Placed outside FP
- Rock-lined Chute w/lunker
- Oxbow Scrape
- Micro-topography
- Moist Soil Unit
- Tile Installation
- Prairie Planting

Thomas Restoration

Plan View

REVISIONS:

CAD FILE:

DESIGNED BY:

DRAWN BY:

SURVEYED BY:

BOOK NO.

DATE 1/23/13

PROJECT NO.:

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

710 Commerce Drive
PO Box 169
Watertown, WI 53094

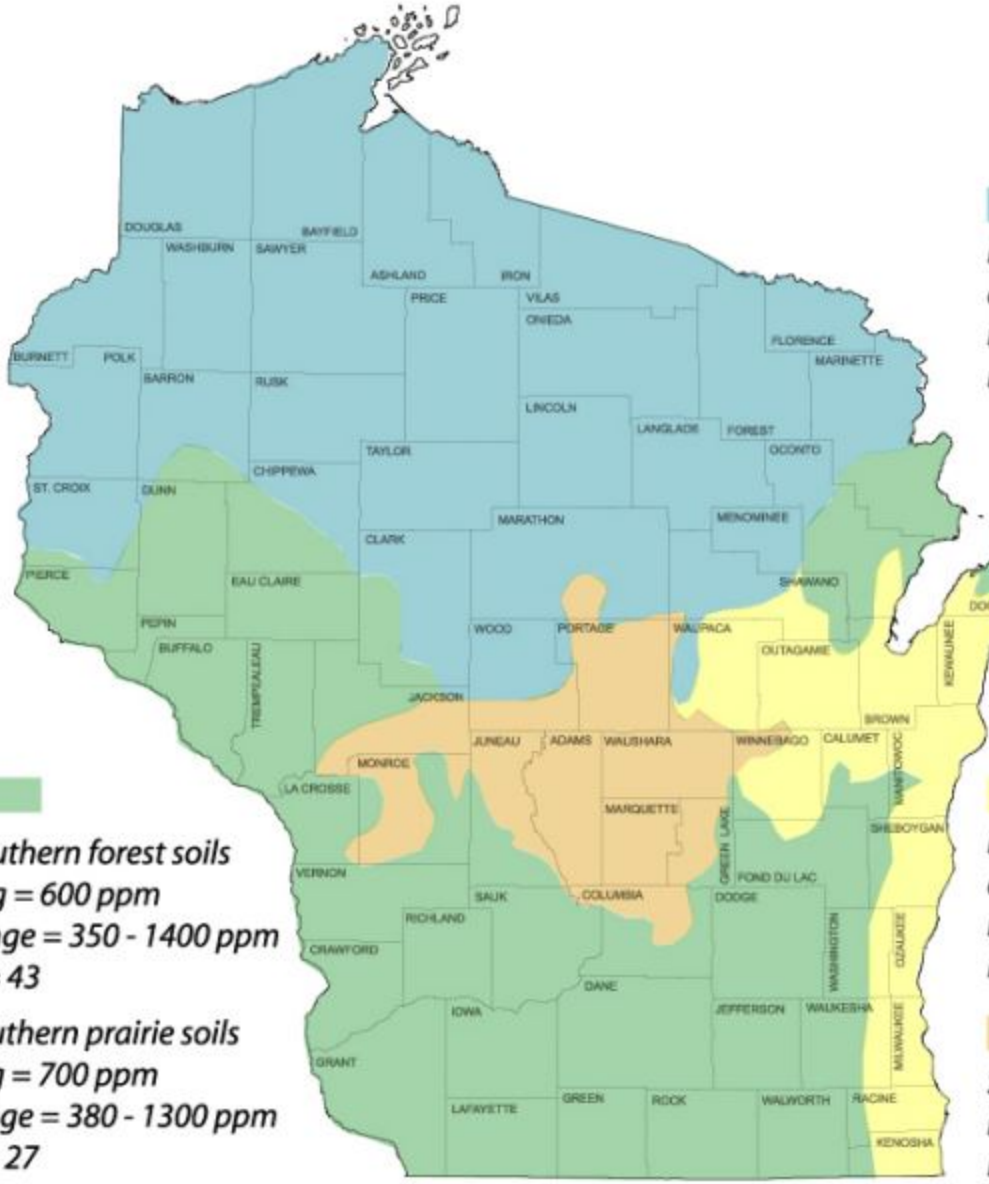
920-261-0446 phone
920-261-1365 fax
www.rockriverlab.com

Insight FS Darlington, WI - Total Phosphorus Analysis 03/03/2023

Field ID	Sample ID	Total P (ppm)
Blue River	8	624.1
Blue River	6	730.9
Blue River	4	666.9
Blue River	17	578.7
Blue River	11	710.7
Blue River	13	829.7
Blue River	14	792.1
Blue River	15	603
Blue River	12	827.5
Blue River	1	1067
Blue River	18	406.3
Blue River	5	708.7
Blue River	9	700.4
Blue River	2	160.2
Blue River	7	538
Blue River	3	523.6
Blue River	16	745
Blue River	10	584.9

Field ID	Sample ID	Total P (ppm)
Avoca	15	429.4
Avoca	17	464.3
Avoca	19	638.8
Avoca	21	286.5
Avoca	23	485.8
Avoca	25	252
Avoca	27	494.9
Avoca	1	423.3
Avoca	3	504.5
Avoca	5	444.6
Avoca	9	565.8
Avoca	7	496.9
Avoca	11	469.9
Avoca	13	532.9
Avoca	29	737.6
Avoca	31	317.6

Soil Total P



Northern loamy soils
avg = 540 ppm
range = 480-580 ppm
n = 4

Southern forest soils
avg = 600 ppm
range = 350 - 1400 ppm
n = 43

Southern prairie soils
avg = 700 ppm
range = 380 - 1300 ppm
n = 27

Eastern red soils
avg = 950 ppm
range = 430 - 2820 ppm
n = 12

Sandy soils
range = 250 - 400 ppm
n = 2

Organic soils: range = 1330 - 1350 ppm, n = 2

Attachment #8

ATTACHEMENT #8
TABLE OF CONTENTS

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 Erosin Estimator. Lateral recession rate was estimated based on the photos provided, description, and on site evaluation. The following includes representative photos of Project Sites to be stabilized through installation of Best Management Practices (BMPs).

II. Blue River Erosion Documentation

Image 1.0 – Chute 1: Severe undercut with bare banks and vegetative overhang

Image 2.0 – Chute 2: Moderate undercut with vegetative overhang

Image 3.0 – Chute 3: Moderate undercut with vegetative overhang

Image 4.0 – Severe vegetative overhang and bare banks

Image 4.1 – Severe vegetative overhang and bare banks

Image 5.0 – Chute 5: Moderate undercut and vegetative overhang

Image 6 – Chute 6: Moderate undercut and vegetative overhang

Image 7.0 – Chute 7: Moderate undercut with slump and vegetative overhang

Image 7.1 – Chute 7: Moderate undercut with slump and vegetative overhang

Image 8.0 – Chute 8: Severe undercut with slump and vegetative overhang

Image 8.1 – Chute 8: Severe undercut with slump and vegetative overhang

Image 8.2 – Chute 8: Severe undercut with slump and vegetative overhang

Attachment #9

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 below[1]:

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:

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

***** 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:

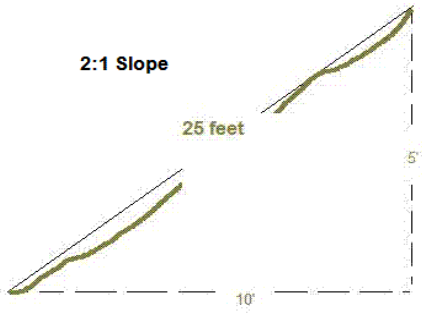
$$\frac{\text{Gully } \textbf{Length} \text{ X (Average } \textbf{Width} \text{ X Average } \textbf{Depth} \text{ X 0.5) X } \textbf{Soil Weight} \text{ (lbs/ft3)}}{2000} \; / \; \text{Formation Years} = \textbf{Estimated} \text{ Soil Loss Per Year (Tons)}$$

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 procedure[2] is used:

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

** 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 occurance 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: East Ridge Farm, LLC
Tract Number: Varies
Evaluated By: J. Fure
Evaluation Date: May 8, 2023

Field Number	Eroding Strmbnk Reach #; or Ditch Side/Bottom	Eroding Bank or Ditch Length (Feet)	Eroding Bank Height; or Ditch Bottom Width* (Feet)	Area of Eroding Strmbank or Ditch (FT^2)	Lateral or Ditch Bottom Recession Rate (Estimated) (FT / Year)	Estimated Volume (FT^3) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT^3	Estimated Soil Loss (Tons/Year)	Soil Total Phosphorus (ppm)	Estimated Phosphorus Loss (Pounds/Year)
East Ridge Farm, LLC	Chute 1 Right	70	2.8	198	0.40	79.2	Silt Loam	85	3.4	710.7	4.8
	Chute 1 Left	70	2.8	198	0.40	79.2	Silt Loam	85	3.4	710.7	4.8
	Chute 2 Right	125	4.2	530	0.20	106.1	Silt Loam	85	4.5	827.5	7.5
	Chute 2 Left	125	4.2	530	0.20	106.1	Silt Loam	85	4.5	827.5	7.5
	Chute 3 Right	160	4.2	679	0.20	135.8	Silt Loam	85	5.8	829.7	9.6
	Chute 3 Left	160	4.2	679	0.20	135.8	Silt Loam	85	5.8	829.7	9.6
	Chute 4 Right	100	5.7	566	0.40	226.3	Silt Loam	85	9.6	792.1	15.2
	Chute 4 Left	100	5.7	566	0.40	226.3	Silt Loam	85	9.6	792.1	15.2
	Chute 5 Right	100	2.8	283	0.20	56.6	Silt Loam	85	2.4	603.0	2.9
	Chute 5 Left	100	2.8	283	0.20	56.6	Silt Loam	85	2.4	603.0	2.9
	Chute 6 Right	100	4.2	424	0.20	84.9	Silt Loam	85	3.6	745.0	5.4
	Chute 6 Left	100	4.2	424	0.20	84.9	Silt Loam	85	3.6	745.0	5.4
	Chute 7 Right	45	2.8	127	0.20	25.5	Silt Loam	85	1.1	578.7	1.3
	Chute 7 Left	45	2.8	127	0.20	25.5	Silt Loam	85	1.1	578.7	1.3
	Chute 8 Right	100	2.8	283	0.40	113.1	Silt Loam	85	4.8	406.3	3.9
	Chute 8 Left	100	2.8	283	0.40	113.1	Silt Loam	85	4.8	406.3	3.9
				TOTAL		1654.6			70.3		**101.0**

Attachment #10

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 Blue River. 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 Director of Public Works 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. **Currently, no BMP projects are planned to occur on Publicly owned property.**

Privately Owned BMP:
District representative to complete inspection form annually and following major storm events. The form will then be provided to the Director of Public Works 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 Green 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:
- 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 spoil out in a layer of less than 6” and seed down. Do not spread soil in wetlands.
- All disturbed areas and spoil must be seeded and mulched.
- Install Root Wad Installation per Project Plans.

Practice Registration:
The purpose of the “Water Quality Trading Management Practice Registration” form is to report to WDNR 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 WDNR of the termination. WDNR 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 WDNR prior to practice termination, no later than the submittal date of the annual report.

BMP Inspection Form

Date_____

Inspector_____

Reason for Inspection _____

Property Owner	Site	Condition BMP	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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? ◯ Yes ◯ 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
◯ Urban NPS ◯ Agricultural NPS ◯ 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 ☐ Yes	Date Entered	Name of Department Reviewer

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

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):

- ☐ Permitted Discharge (non-MS4/CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☐ Agricultural nonpoint source discharge
- ☐ 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?

- ◯ Yes
- ◯ No
- ◯ Unsure

Will this termination result in non-compliance with the effective limit or other permit requirements?

- ◯ Yes; Name: _____
- ◯ No
- ◯ 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

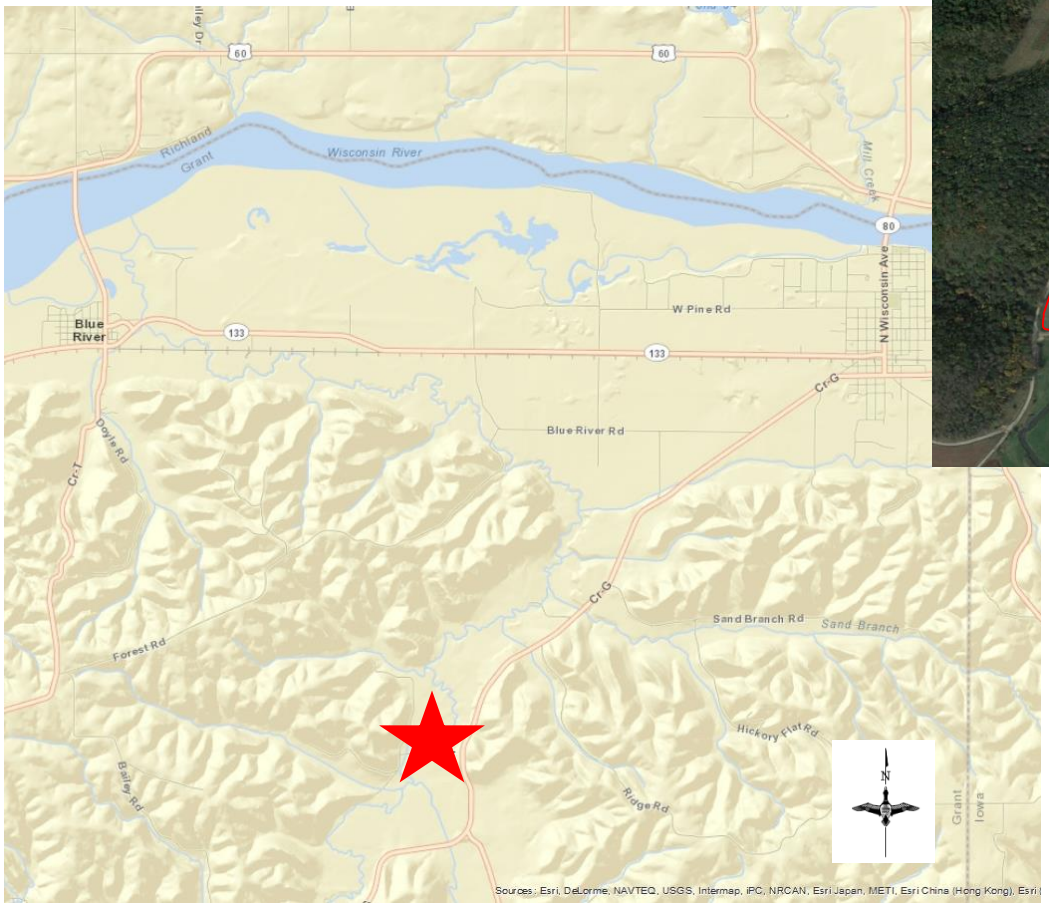
Attachment #11

Thomas Restoration

2295 Studnika Rd
Muscoda, WI

Muscoda Township
Grant Co, WI

T8N R1W
Section 29



Location: 5 mile South of Muscoda off County Rd G

Site Location

Contact Information

Project Lead:
Mike Engel
USFWS
(608)221-1206 X21
4511 Helgesen Dr.
Madison, WI 53718
mike_engel@fws.gov

Land Owner:
Joe Thomas
4904 Champions Run
Middleton, WI 53562
jhthomas22@gmail.com

DIGGERS HOTLINE
"Call 3 Work Days Before You Dig!"
TOLL FREE 1-800-242-8511
MILW. AREA (414) 259-1181
TDD 1-800-542-2289

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Cover/ Location

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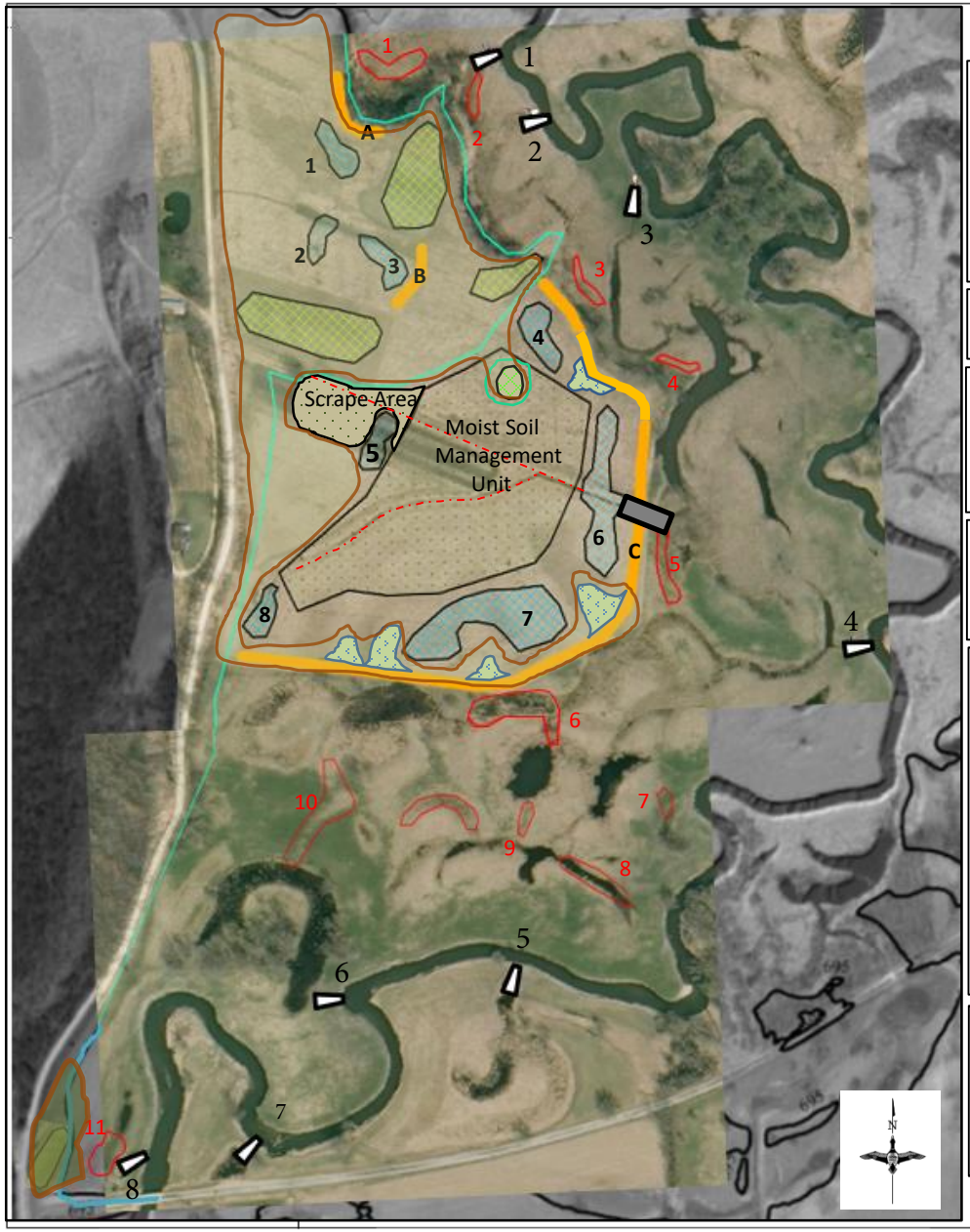
DATE: 1/23/13
PROJECT NO.:



Notes:

Material placed in the flood plain associated with berm C is less than material removed from the food plain associated with oxbow restoration 1,2,3,7,8,9,10, 11 and scrape 5 along with borrow from 4,6,7,8 above ground water level used in building berms and will result in increased flood storage (see page 3)

Oxbow scrapes will be located in areas dominated by reed canary grass

Micotopography work will accentuate existing topographic features by moving 4 inches or less in targeted areas. These areas will receive custom seed mixes to establish wet prairie.

Moist soil management unit will involve scraping (spoils moved out of flood plain), leveling, and tile installation for waterfowl and shorebird management.

Erosion Control Plan

Immediately after earth moving is complete the site will be seeded and planted where appropriate . Erosion control matting will be placed on areas where slopes are greater than 5:1. Mulch may be used in areas less than 5:1. Culverts leading to river will be monitored and straw bales placed if needed. All erosion control will be installed and maintained according to NRCS technical standards (see attached NRCS Standard 484).

Planting/Seeding Plan

Planting and seeding will be established in accordance to NRCS Wisconsin Agronomy Technical Note 5 (see attached). All disturbed areas will be seeded down to a native prairie mix (see Table 17, Tech Note 5). Seed mix may be altered due to seed availability but diversity should remain the same.

Legend

- Water Control Structure
- Borrow/Scrape
- Berm
- Approximate Flood Plain
- Spoil Placed outside FP
- Rock-lined Chute w/~~lunker~~ root wad
- Oxbow Scrape
- Micro-topography
- Moist Soil Unit
- Tile Installation
- Prairie Planting

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Plan View

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DATE 1/23/13

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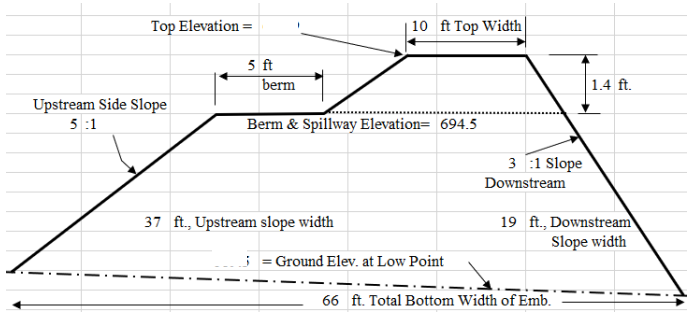
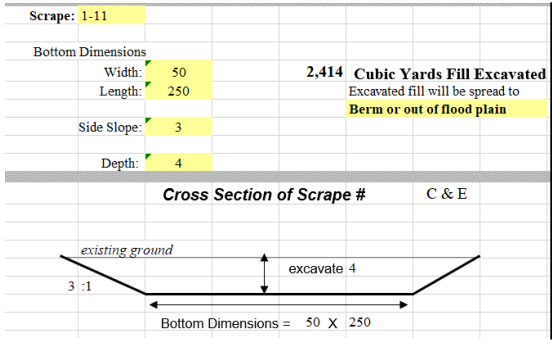
TYPICAL CROSS SECTION OF BERM

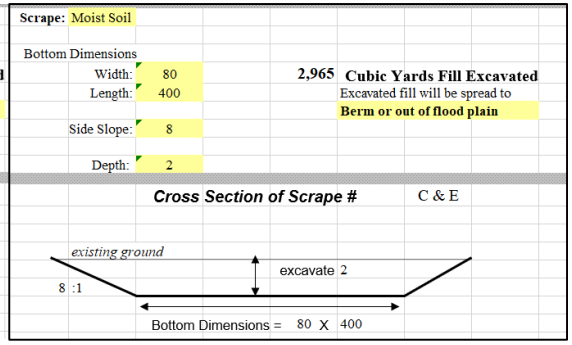


Note:
Remove all sod and muck from under embankment

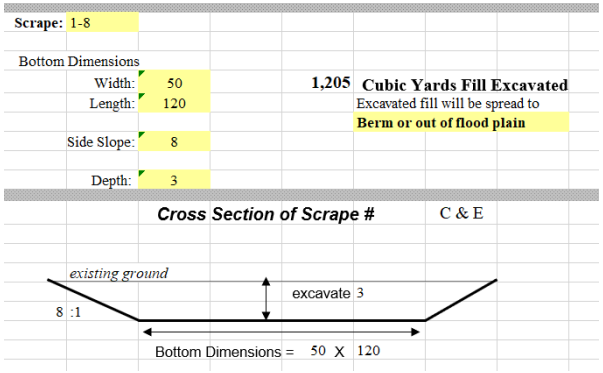
TYPICAL CROSS SECTION OF OXBOW SCRAPE



TYPICAL CROSS SECTION OF MOIST SOIL SCRAPE



TYPICAL CROSS SECTION OF BORROW/SCRAPE



Borrow areas to be located and shaped according to Plan View (Page 2)

Estimated Quantities

Feature	Linear Ft	Area (Ac.)	Volume (Yds³)
Berm A	100	0.1	300
Berm B	100	0.1	300
Berm C	2290	2.20	12,000
Moist Soil Scrape*	N/A	1.1	3,500
Oxbow 1*	N/A	0.5	2,400
Oxbow 2*	N/A	0.3	1,200
Oxbow 3*	N/A	0.3	1,200
Oxbow 4	N/A	0.3	1,200
Oxbow 5	N/A	0.3	1,200
Oxbow 6	N/A	0.5	2,400
Oxbow 7*	N/A	0.2	800
Oxbow 8*	N/A	0.3	1,200
Oxbow 9*	N/A	0.2	800
Oxbow 10*	N/A	0.3	1,200
Oxbow 11*	N/A	0.2	800
Borrow 1	N/A	0.3	300
Scrape 2*	N/A	0.3	1,200
Borrow 3	N/A	0.3	300
Borrow 4	N/A	0.3	1,200
Scrape 5*	N/A	0.3	1,200
Borrow 6	N/A	0.5	2,400
Borrow 7	N/A	0.3	1,200
Borrow 8	N/A	0.3	1,200
TOTAL	2490	9.3	28,100

* Indicates volume removed from floodplain (13,500Yds³) to offset Berm C. With additional storage from exchange of yardage in barrow areas the project results in an increased flood storage capacity of at least 300,000 gallons.

Berms are non-additive relative to volume as they are constructed using Barrow areas and Oxbow 4, 5, and 6 .

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Design & Quantities

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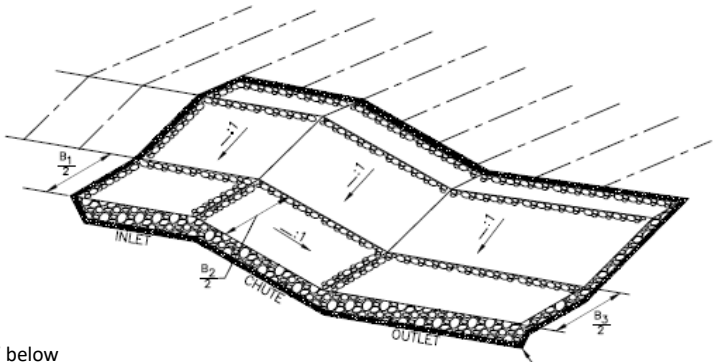
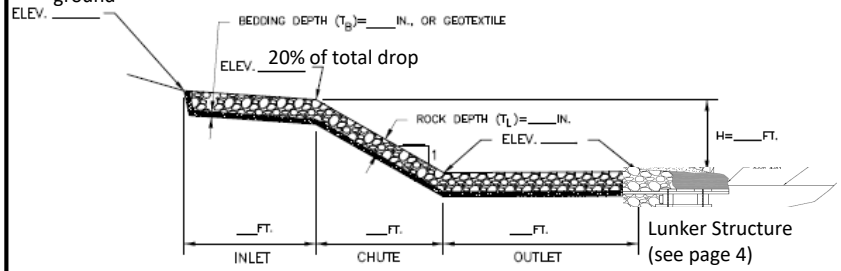
Typical Rock Lined Chute



HALF SECTION OF ISOMETRIC VIEW



PROFILE ALONG CENTERLINE

QUANTITY ESTIMATE

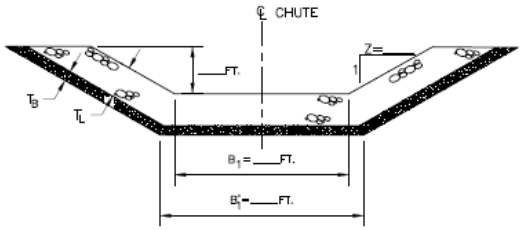
SITE PREPARATION _____ JOB

BEDDING MATERIAL (CONST. SPEC. 8) _____ _____ CU. YD.

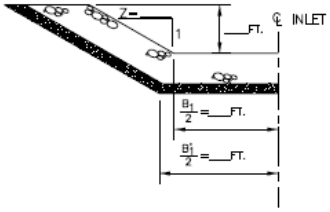
ROCK FOR RIPRAP (CONST. SPEC. 9) _____ _____ CU. YD.

GEOTEXTILE (CONST. SPEC. 13)
(WOVEN) (NONWOVEN) CLASS 2,500 SQ. YD.

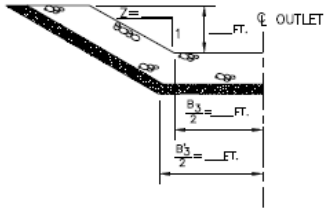
SEEDING _____ _____ ACRES



CROSS SECTION OF CHUTE
(AT CENTER)



HALF SECTION OF INLET
(AT UPSTREAM EDGE)



HALF SECTION OF OUTLET
(AT DOWNSTREAM EDGE)

Notes:

- Rock size shall be mixed with predominately 4-6 inch class.
- Rock shall be a minimum of 12 inches thick.
- Geotextile fabric edges shall be positioned as to not allow water underneath.

Feature	Linear Ft (Inlet+Chute+Outlet)	Depth "H"	Volume (Yds^3)
Chute 1	70	2	65
Chute 2	125	3	140
Chute 3	160	3	175
Chute 4	100	4	150
Chute 5	100	2	95
Chute 6	100	3	110
Chute 7	45	2	40
Chute 8	100	2	95
Total	800	na	870

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Chute Detail/ Quantities

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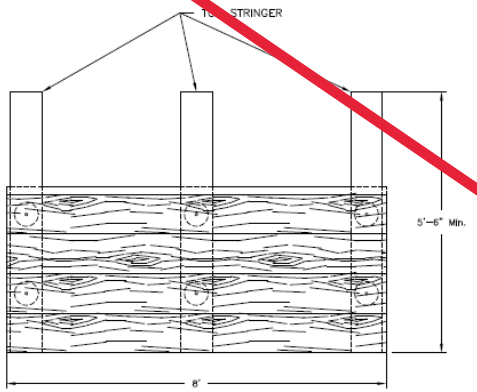
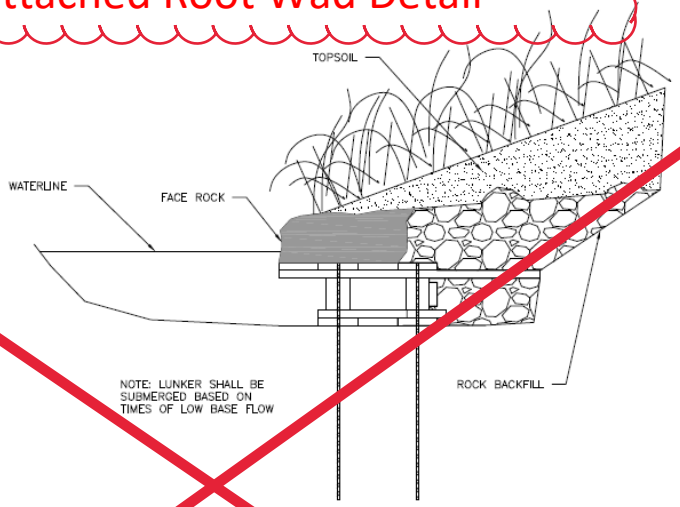
Lunker Structure

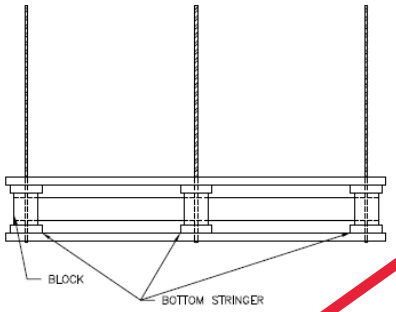
Replaced with Root Wad Structure
See attached Root Wad Detail



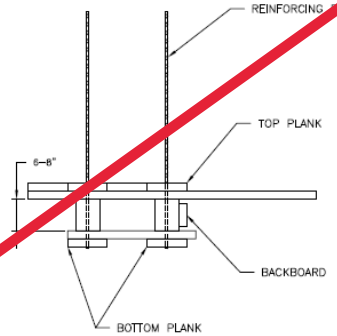
TOP VIEW



CONSTRUCTED SIDE VIEW



FRONT VIEW



SIDE VIEW

BILL OF MATERIALS
LUNKER STRUCTURE

ITEM	SIZE	QUANTITY
TOP PLANK	2" X 8" X 8' OAK BOARD	4
TOP STRINGER	2" X 8" X 5'–6" Min OAK BOARD	3
BLOCK	6" DIA. X 8" OAK BLOCK	6
BOTTOM STRINGER	2" X 8" X 30" BOARD	3
BOTTOM PLANK	2" X 8" X 8' OAK BOARD	2
BACKBOARD	2" X 8" X 8' OAK BOARD	1
#5 REINFORCING ROD	5/8" X 5' DEFORMED STEEL	6
RINGSHANK NAILS	20D GALVANIZED	60

10 Total Boards 2" X 8" X 8 Feet Long

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Lunker Structure Detail

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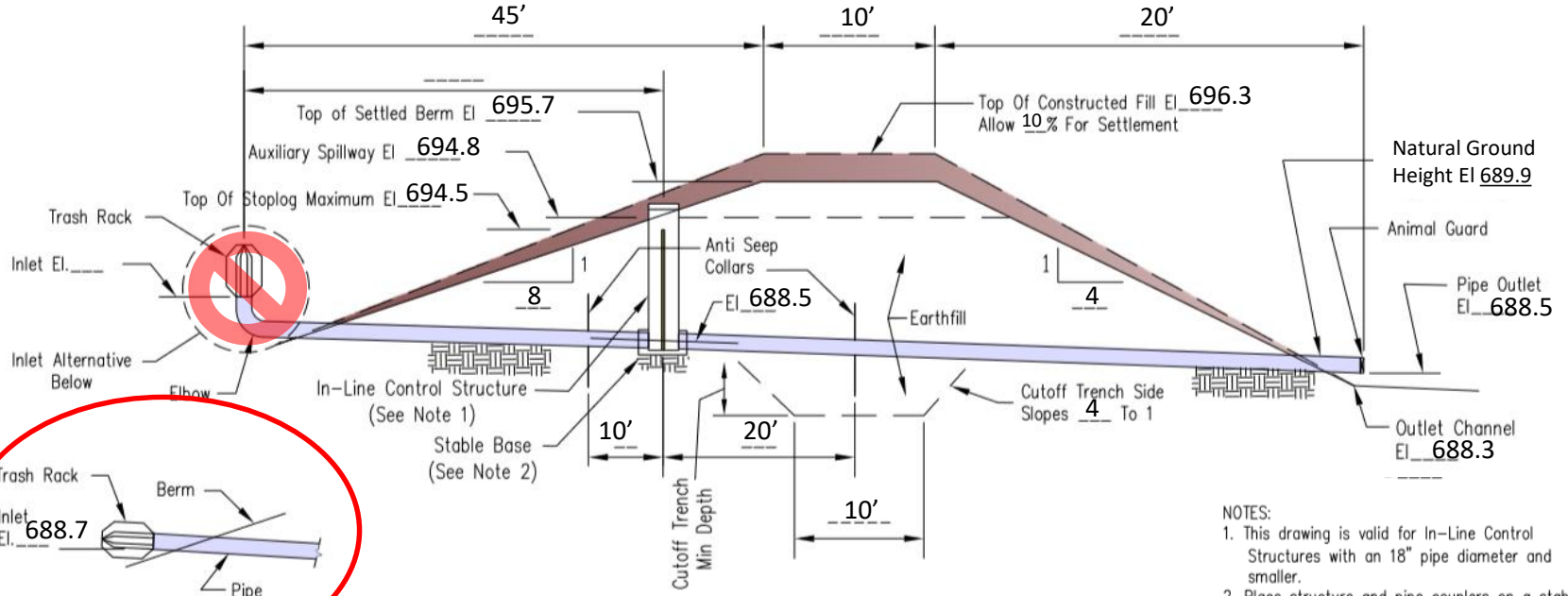


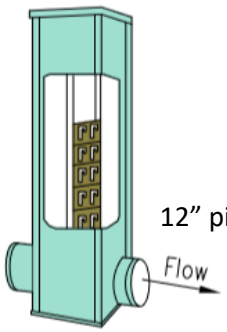
INLET ALTERNATIVE

Note: Use Inlet Alternate Design Option

STRUCTURE BERM CROSS SECTION

NOTES:
1. This drawing is valid for In-Line Control Structures with an 18" pipe diameter and smaller.
2. Place structure and pipe couplers on a stable base. A stable base may be compacted earth, compacted fill sand, or a concrete pad. Extend the stable base no less than 1 foot around structure.
3. PVC Pipe must conform to ASTM Standard D 2241 or D 1785. Pipe material must be PVC 1120 or PVC 1220.
4. Excavated material placed around structure, spillway pipe and anti-seep collar must be hand compacted in 4 inch lifts to same density requirements specified for the adjacent embankment.
5. Stuctural height = 5.8 feet.
   Natural Ground Low Point 689.9 to top of berm (design) 695.7

Item	Quantity
Water Control Structure (12" dia/ 5' tall)	1
Anti-seep collar	2
12" Diameter Pipe	75 Feet
Note: Include all necessary connections, trash rack and animal gard	



12" pipe 5' tall

IN-LINE CONTROL STRUCTURE

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Design/Water Control Structures

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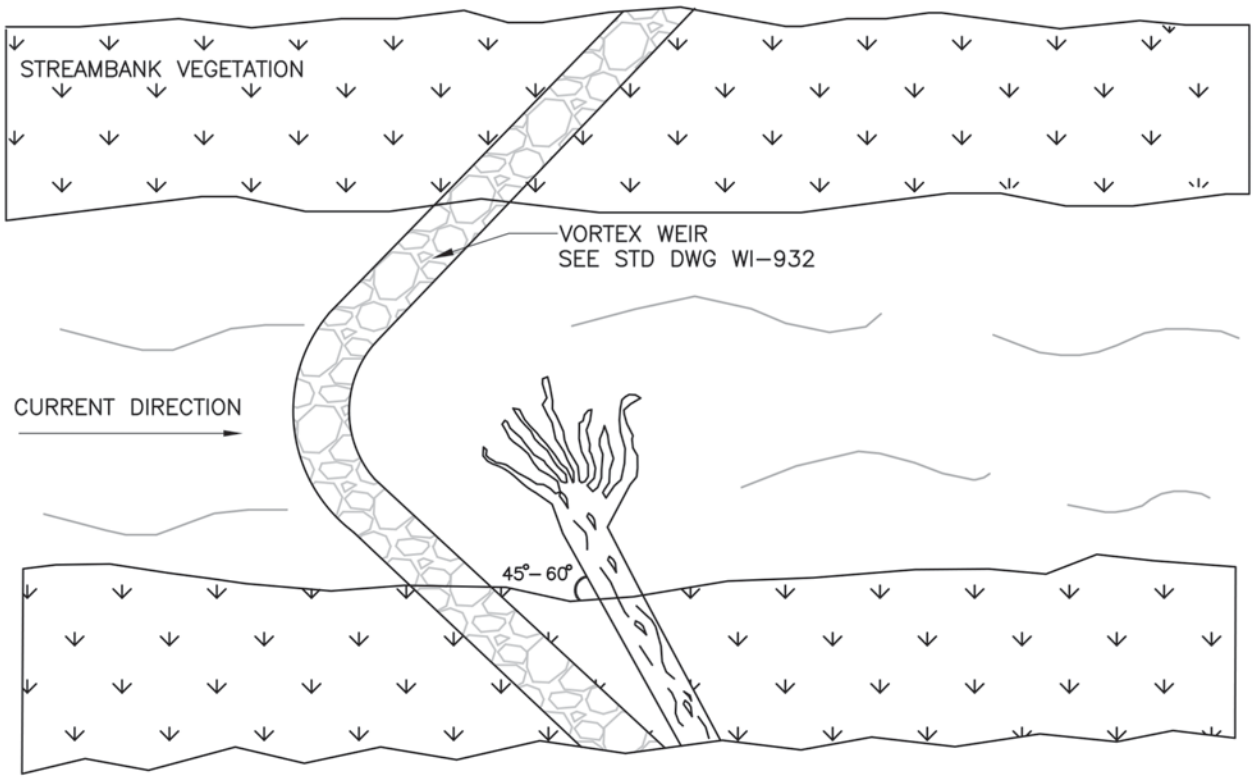
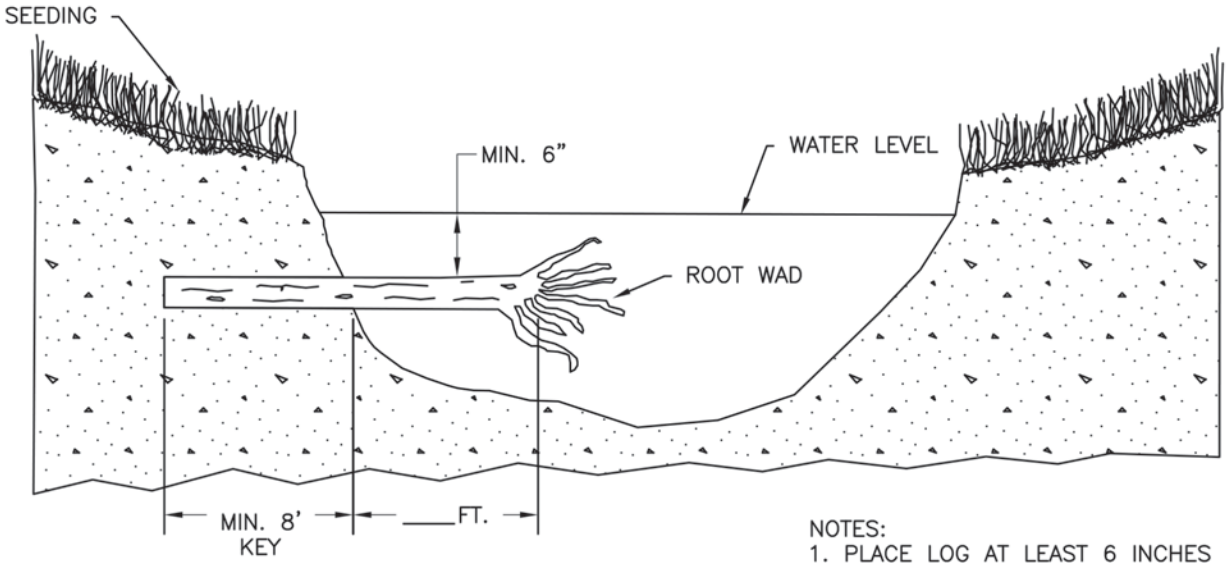


PLAN



CROSS SECTION

NOTES:
1. PLACE LOG AT LEAST 6 INCHES BELOW THE WATERLINE.
2. PLACE LOG AT A 45–60 DEGREE ANGLE UPSTREAM FROM BANK.
3. REFERENCE WI STD DWG 932 FOR DETAILS ON VORTEX WEIR CONSTRUCTION.

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

ROOT WAD

CLIENT: _____

COUNTY: _____

	Date	Drawing Name
Designed		WI–936
Drawn		Date 7/10
Checked		
Approved		Sheet of