Permit Fact Sheet

General Information

Permit Number	WI-0021423-10-0
Permittee Name and Address	VILLAGE OF CASSVILLE P O Box 171 100 West Amelia Street, Cassville, WI 53806-0171
Permitted Facility Name and Address	Cassville Wastewater Treatment Facility 1022 JACK OAK ROAD, CASSVILLE, WISCONSIN
Permit Term	January 01, 2026 to December 31, 2030
Discharge Location	Discharge located in the NE ¼ of the SE 1/3 of Section 29, Township 3 North Range 5 East. North bank of the Jack Oak Slough ¼ mile downstream of the boat landing. Lat.: 42.70650ºN Long.: 90.97870ºW
Receiving Water	Jack Oak Slough of the Mississippi River in Mississippi River of Grant-Platte in Grant County
Stream Flow ($Q_{7,10}$)	N/A – Slough discharge; 10:1 dilution factor for calculating water quality based effluent limits.
Stream Classification	Warmwater Sport Fishery, non-public water supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.396 MGD
Industrial or Commercial Contributors	Rapid Dye and Molding, Co. (formerly Loudspeaker Components)
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Cassville Wastewater Treatment Facility is a contact stabilization activated sludge wastewater treatment facility that includes an influent lift station, mechanical screen, grit removal, aeration (contact) tank, final clarifier, reaeration tank, UV disinfection, and chemical phosphorus removal. Solids are aerobically digester and stored in a sludge storage tank on site prior to land application. The chemical phosphorus removal system was completed in May 2022. No other treatment upgrades were completed during the current permit term. The last major upgrade occurred in 2015 with a new headworks, sludge loading pad, and UV.

Substantial Compliance Determination

Enforcement During Last Permit: There have been violations of effluent limits, late reporting, overflows, and failing to comply with the biosolid metal limitations and vector attraction reduction requirements. However, the facility has completed all previously required actions as part of the enforcement process. After a desk top review of all discharge

monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 08/30/2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Caitlin O'Connell, Wastewater Engineer, on September 11, 2023.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	N/A	Influent: 24-Hr flow proportional composite sampler intake located prior to the aeration basin but after fine screening and grit removal. Flow meter located in headworks building.
001	0.11 MGD (January 2019 - March 2025)	Effluent: 24-Hr flow proportional composite sampler intake located before the UV channel, prior to discharge to Jack Oak Slough. Grab samples collected after UV. Flow meter located in the effluent channel.
003	30 Dry US Ton (Permit Application for this reissuance)	Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge storage tank.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

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

Influent limitations and monitoring requirements were evaluated for this permit term, reporting of Flow Rate was added as the permittee has an influent flow meter.

Explanation of Limits and Monitoring Requirements

Influent flow monitoring was added to characterize influent wastewater volumes subject to the monitoring provisions in s. NR 210.04(2), Wis. Adm. Code, and reporting requirements in s. NR 205.07(1)(r)2, Wis. Adm. Code. BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to

demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

2 Surface Water - Monitoring and Limitations

2.1 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	
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	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2029 only.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	May – September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	May - September. See the E. coli Percent Limit section. Enter the result in the DMR on the last day of the month.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only in 2029.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See 'PFOS/PFOA Minimization Plan Determination of Need' in the schedules section.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See 'PFOS/PFOA Minimization Plan Determination of Need' in the schedules

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					section.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim MDV limit effective through December 2027. See the MDV/Phosphorus subsections and phosphorus schedules.
Phosphorus, Total	Monthly Avg	0.8 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim MDV limit effective on January 1, 2028. See the MDV/Phosphorus subsections and phosphorus schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Temperature Maximum		deg F	3/Week	Grab	Monitoring only in 2029.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **Flow-** The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **E. coli-** Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.
- **pH-** Sample frequency for pH increased to 5/week.
- **Chloride and Ammonia -** Sampling for one year of the permit term in 2029 added.
- **PFOS and PFOA** – Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.
- **Phosphorus MDV-** The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 0.8 mg/L has been added that goes into effect per a compliance schedule. The permittee is now required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall submit a report summarizing the watershed projects implemented during the previous year in excess of the target value of 0.2 mg/L.
- **Temperature –** Monitoring added in 2029 only.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)-** Quarterly monitoring is required as outlined in the permit.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 6/24/25.

Monitoring Frequencies- 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 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 sampling frequency for pH was increased to 5/week which is the standard pH frequency. Phosphorus sampling frequency increased to match the frequency for BOD and TSS as this is the standard practice for all municipal treatment facilities.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

Phosphorus – Phosphorus rules became effective December 1, 2010 per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.30 mg/L monthly average and 0.10 mg/L six-month average along with 0.33 lbs/day six-month average and were to become effective as scheduled unless a variance was granted. For this permit term, the permittee has applied for the Multi-Discharger Variance (MDV) Watershed approach for phosphorus as provided for in s. 283.16, Wis. Stats. The permittee qualifies for the MDV because it is an existing source and a major facility upgrade is needed to comply with the applicable phosphorus WQBELs, thereby creating a financial burden. The interim effluent limit for total phosphorus is 1.0 mg/L as an average monthly limit upon reissuance and 0.8 mg/L as a monthly average per the schedule.

Conditions of the MDV require the permittee to optimize phosphorus removal throughout the proposed permit term, comply with interim limits and implement a plan that is designed to result in annual phosphorus reductions from other sources in the basin based on the pounds of phosphorus discharged during the previous year in excess of the specified target value.

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), 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, it was identified that previous PFOS/PFOA sample results were within 1/5 of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

Therefore, monitoring once every two months is included. A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

Temperature- Monitoring frequency was determined based on the current temperature meter used by the permittee and the need for one year of temperature data. The permittee utilizes a temperature probe and therefore must sample 3/Week following the required Grab temperature sample procedures.

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)**
003	B	Liquid	Fecal Coliform	Incorporation or SOUR	Land Application	30 Dry U.S. Tons
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? **No** If 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** Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 003- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2026.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2026.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

PCB – Sampling year updated.

PFAS –Monitoring is required annually pursuant to s. NR 204.06(2)(b)9, Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Requirements for disposal, including 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.

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 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9, Wis. Adm. Code.

4 Schedules

4.1 Phosphorus Schedule - Continued Optimization

The permittee is required to optimize performance to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization: The permittee shall continue to implement the Optimization Plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	01/31/2027
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	01/31/2028
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	01/31/2029

Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	01/31/2030
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	12/31/2030

Explanation of Schedule

Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to continue to implement the optimization plan that was approved during the previous permit term.

4.2 Watershed Project Annual Reports

The permittee is required to submit annual watershed project reports in accordance with the following schedule.

Required Action	Due Date
Annual Watershed Report: Submit an annual report by May 1 of each year that documents: 1) The calculated monthly discharge of phosphorus in lbs/month and the calculated monthly target value in lbs/month for the previous calendar year. See the calculation steps in the Surface Water section of this permit. 2) The calculated Annual Offset to be used under the approved Watershed Plan for the previous calendar year. See the calculation steps in the Surface Water section of this permit. 3) Verification that Watershed Plan # MDV-2025-001 was implemented as approved and practices are operated and maintained consistent with the approved plan. 4) The pounds of phosphorus reduction achieved through the approved Watershed Plan for the previous calendar year. 5) The source of the phosphorus reductions with a reference to the approved Watershed Plan used to generate the offset. 6)Identification of any non-compliance or failure to implement the approved Watershed Plan. The first report is due by the specified Due Date.	03/01/2026
Annual Watershed Report #2: Submit an annual report that includes the documentation listed above.	03/01/2027
Annual Watershed Report #3: Submit an annual report that includes the documentation listed above.	03/01/2027
Annual Watershed Report #4: Submit an annual report that includes the documentation listed above.	03/01/2028
Agreement Modification: If the required offset of phosphorus is not generated by the approved Watershed Plan in any year, the permittee shall propose a modification to the binding written agreement or seek alternative compliance or variance options allowed under state law. Note: Failure to propose a modification to achieve compliance with the offset requirements may result in termination of the binding written agreement.	
Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Offset After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit annual reports to the Department including the information above by May 1 each year.	

Explanation of Schedule

Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Watershed Project" watershed option described in s. 283.16(8m), Wis. Stats. Under this option the permittee shall implement a plan that is designed to result in annual reductions from other sources in the basin based on the pounds of phosphorus discharged during the previous year in excess of the specified target value. This schedule requires the permittee to submit annual reports to the Department indicating adherence to the approved watershed plan.

4.3 Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L)

This compliance schedule requires the permittee to achieve compliance with the specified MDV interim effluent limit in accordance with s. 283.16(6), Wis. Stats., by the due date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of phosphorus with conclusions regarding compliance.	06/30/2026
Action Plan: Submit an action plan for complying with the specified interim effluent limit. If construction is required, include plans and specifications with the submittal.	09/30/2026
Initiate Actions: Initiate actions identified in the plan.	06/30/2028
Complete Actions: Complete actions identified in the plan and achieve compliance with the specified interim effluent limit.	01/01/2028

Explanation of Schedule

Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. The schedule above provides the permittee with two years to comply with that limit.

4.4 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	01/01/2027
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA	01/01/2028

minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

Explanation of Schedule

As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

4.5 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 and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. 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.	01/01/2027

Explanation of Schedule

An up-to-date Land Application Management Plan is required that documents how the permittee will manage the land application of biosolids consistent with ch. NR 204, Wis. Adm. Code

Other Comments

None

Attachments

Water Quality Based Effluent Limits dated 6/24/25

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance.

Prepared By: Jennifer Jerich, Wastewater Specialist

Date: 10/17/2025

Revision date after Fact Sheet: 10/31/2025

Revision date after Public Notice:

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: June 24, 2025

TO: Jennifer Jerich – SCR/Horicon

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for Cassville Wastewater Treatment Facility
WPDES Permit No. WI-0021423-10-0

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 Cassville Wastewater Treatment Facility in Grant County. This municipal wastewater treatment facility (WWTF) discharges to the Jack Oak Slough on the Mississippi River, located in the Mississippi River Watershed in the Grant-Platte 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						1,4
E. coli May – September				126 #/100 mL geometric mean		3
Chloride						4
PFOS and PFOA						5
Phosphorus				0.30 mg/L	0.10 mg/L 0.33 lbs/day	6
Temperature, Maximum						7
TKN, Nitrate+Nitrite, and Total Nitrogen						8

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. Monitoring at a frequency to ensure that a minimum of 11 samples are available at the next permit issuance.
5. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
6. A Water Quality Trading plan has been submitted as an alternative compliance option. If the plan is approved, phosphorus WQBELs may be expressed as computed compliance limits, and a minimum control level of 1.0 mg/L should not be exceeded at the outfall.

7. Temperature monitoring is recommended in order to determine the need for limits at the next permit reissuance.
8. As recommended in the Department's October 1, 2019 *Guidance for Total Nitrogen Monitoring in Wastewater Permits*, quarterly total nitrogen monitoring is recommended for all facilities with total nitrogen greater than 40 mg/L. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N). Total nitrogen was reported as 43.0 mg/L on the permit application.

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, 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 (3) – Narrative, Site Map, and Thermal Table

PREPARED BY: Sarah Luck _____ Date: June 24, 2025

Sarah Luck
Water Resources Engineer

E-cc: Caitlin O'Connell, Wastewater Engineer – SCR/Dodgeville
Lisa Creegan, Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Cassville Wastewater Treatment Facility

WPDES Permit No. WI-0021423-10-0

PART 1 – BACKGROUND INFORMATION

Facility Description

Cassville Wastewater Treatment Facility is a contact stabilization activated sludge wastewater treatment facility that includes an influent lift station, mechanical screen, grit removal, aeration (contact) tank, final clarifier, reaeration tank, UV disinfection, and chemical phosphorus removal. Solid processes include an aerobic digester, sludge storage tank, and overhead sludge loading pad. The chemical phosphorus removal system was completed in May 2022. No other treatment upgrades were completed during the current permit term. The last major upgrade occurred in 2015 with a new headworks (mechanical screen, grit removal, etc.), sludge loading pad, and UV. The plant was constructed in 1967.

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

Existing Permit Limitations

The current permit, which expired on December 31, 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
Phosphorus Interim IPV Interim Final				 1.4 mg/L 1.0 mg/L 0.3 mg/L	 0.1 mg/L 0.33 lbs/day	4

Footnotes:

1. Monitoring only.
2. These limits are based on the Warm Water Sport Fish community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. Additional limit to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, is included in bold.
4. The facility was covered under an individual phosphorus variance (IPV) with the interim limit of 1.0 mg/L becoming effective January 1, 2023.

Receiving Water Information

- Name: Jack Oak Slough (on the Mississippi River)
- Waterbody Identification Code (WBIC): 721900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use.
- Flow: A ten-to-one dilution ratio will be used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code, because the receiving water does not exhibit a unidirectional flow at the point of discharge.
  Historically, low flows for the Mississippi River from the USGS station near Cassville were used (7-Q_{10} = 10,400 cubic feet per second (cfs) and 7-Q_2 = 16,000 cfs). However, it was noted in the previous evaluation that the discharge is to a slough, so the full flow of the Mississippi River is not available for dilution at the point of discharge. Additionally, a site visit was conducted by Department staff on 4/2/25 where it was noted that the receiving water was not unidirectional resulting in the change to 10:1 dilution. The Department will continue to monitor the characteristics of the receiving water at the outfall and may make changes to the limits in the future if warranted.
- Hardness = 343 mg/L as $CaCO_3$. This value represents the geometric mean of data (n=2) from WET testing conducted by the Potosi-Tennyson Sewage Commission Wastewater Treatment Facility, located approximately 14 miles downstream of the discharge, on August 30, 2011, and April 14, 2012.
- Source of background concentration data: Metals data from Lock/Dam 9 along the Mississippi River at Lynxville is used for this evaluation because there is no data available at the Cassville outfall location. 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 and phosphorus are described later.
- Multiple dischargers: None to the slough, several to the Mississippi River, but not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Mississippi River is 303(d) listed for phosphorus, PCBs, and mercury impairments where Jack Oak Slough joins.

Effluent Information

- Flow rate:
  Design annual average = 0.396 Million Gallons per Day (MGD)
  For reference, the actual average flow from January 2019 through March 2025 was 0.11 MGD.
- Hardness = 379 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in December 2022 which were 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).
- Wastewater source: Domestic and commercial wastewater with no industrial contributors.
- Water supply: Municipality waterworks.
- Additives: Aluminum Sulfate (phosphorus removal)
- 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 chloride and hardness.
- 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.

Attachment #1

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
12/01/22	11.0	12/15/22	14.8	12/29/22	15.1
12/05/22	12.1	12/19/22	13.8	01/02/23	2.78
12/08/22	11.3	12/22/22	16.6	01/05/23	12.3
12/12/22	13.5	12/26/22	18.2		
1-day P_{99} = 24.9 µg/L					
4-day P_{99} = 18.2 µg/L					

Chloride Effluent Data

Sample Date	Chloride (mg/L)
12/01/22	391
12/05/22	350
12/08/22	401
12/12/22	330
Mean	368

The following table presents the average concentrations and loadings at Outfall 001 from January 2019 through March 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Average of Parameters with Limits

	Average Measurement	Average Mass Discharged
BOD_5	5 mg/L	
TSS	9 mg/L	
pH field	7.5 s.u.	
Phosphorus	1.36 mg/L	1.02 lbs/day
Fecal Coliform	8#/100 mL*	

*The average measurement for bacteria is calculated as a geometric mean.

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

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. For discharges to lakes, daily, or acute, limits are calculated as equal to 2 × ATC.

Chronic Limits

Chronic limits for lake discharges are based on an estimated 10:1 lake: effluent mixing zone unless a previous mixing zone study has established a more appropriate mixing zone. Chronic limits based on CTC, WC, HTC, or HCC are derived as follows:

Limitation = 11(WQC) - 10 (Cs)

Where:

WQC =Water quality criterion or secondary acute value according to ch. NR 105

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

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 = 10 to 1 Mixing Zone, 2xATC

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	1.92		
Cadmium	379	47.5	95.1	19.0	<0.084		
Chromium	301	4446	8891.7	1778	<0.70		
Copper	379	54.6	109.1			24.9	18.2
Lead	356	365	729.3	145.9	<1.08		
Nickel	268	1080	2160.6	432	2.78		
Zinc	333	345	689.4	137.9	79.2		
Chloride (mg/L)		757	1514.0	303	**368****		

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

**See chloride discussion below tables.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 10 to 1 Mixing Zone

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		1674	334.8	1.92	
Cadmium	175	3.82		42.02	8.4	<0.084	
Chromium	301	325.75	0.56	3578	715.5	<0.70	
Copper	343	29.73	2.43	302.7			18.2
Lead	343	92.18	0.84	1005.6	201.1	<1.08	
Nickel	268	120.18		1322	264.4	2.78	
Zinc	333	344.68	14.1	3650	730.1	79.2	
Chloride (mg/L)		395	17.8	4167	833.4	368	

* 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 = 10 to 1 Mixing Zone

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370		4070	814.0	<0.084
Chromium (+3)	3818000	0.56	41997994	8399599	<0.70
Lead	140	0.84	1532	306.3	<1.08
Nickel	43000		473000	94600	2.78

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 10 to 1 Mixing Zone

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	146.3	29.26	1.92

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.**

Chloride – Four chloride samples were collected during December 2022 as part of permit application sampling, the mean of which is presented in the tables above. Additional data were also collected monthly from 2019 through 2023 but were not entered in the Discharge Monitoring Reports (DMRs). A review of that data showed the maximum value was 450 mg/L which is well 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 Cassville 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 six samples collected between April 2019 through April 2024 was 2.51 mg/kg, with a maximum reported concentration of 4.57 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. Previous monitoring produced a PFOS result of 3.70 ng/L and a PFOA result of 9.87 ng/L. The PFOS result is greater than one fifth of the 8 ng/L criterion. Based on the available monitoring data, **PFOS and PFOA monitoring is recommended once every two months**.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BOD_5, TSS, pH, AND DISSOLVED OXYGEN

These limits are being re-evaluated because the receiving water flow rate has changed.

BOD_5 & DO

In establishing biological oxygen demand (BOD_5) limitations, the primary intent is to prevent a lowering of dissolved oxygen (DO) levels in the receiving water below water quality standards as specified in ss. NR 102.04(4)(a) and (b), Wis. Adm. Codes. The 26-lb method (13-lb method for cold water community streams) is the most frequently used approach for calculating BOD_5 limits when resources are not available to develop a detailed water quality model. This simplified model was developed in the 1970s by the Wisconsin Committee on Water Pollution on the Fox, Wisconsin, Oconto, and Flambeau Rivers. Further studies throughout the 1970s proved this model to be relatively accurate. The model has since then been used by the Department on many occasions when resources are not available to perform a site-specific model. The "26" value stems from the following equation:

$$\frac{26\ {}^{\text{lbs}}/_{\text{day}}}{{}^{\text{ft}^3}/_{\text{sec}}} * \frac{1\,\text{day}}{86{,}400\,\text{sec}} * \frac{454{,}000\,\text{mg}}{\text{lbs}} * \frac{1\,\text{ft}^3}{28.32\,\text{L}} = 4.8 = 2.4 * 2\ {}^{\text{mg}}/_{\text{L}}$$

The 4.8 mg/L has been calculated by taking 2.4 mg/L which is the number one receives when converting 26 lbs of BOD/day/cfs into mg/L, multiplied by 2.0 which is the change in the DO level for warm water community streams. A typical background DO level for Wisconsin waters is 7.0 mg/L, so a 2.0 mg/L decrease is allowed to meet the 5.0 mg/L standard for WWSF community streams. The above relationship is temperature dependent, and an appropriate temperature correction factor is applied. The 26-lb method is based on a typical 24°C summer value for warm water streams. Adjustments for temperature are made using the following equation:

$$k_t = k_{24}\left(0.967^{(T-24)}\right)$$

Where k_{24} = 26 lbs of BOD/day/cfs

Calculations based on Full Assimilative Capacity at 7-Q_{10} Conditions:

$$WA\ Limit\ \left(\frac{mg}{L}\right) = 2.4 * (DO_o - DO_{std}) * \frac{7Q_{10} + Q_e * (1-f)}{Q_e} * 0.967^{T-24}$$

Where:

Q_e = effluent flow = 0.396 MGD = 0.613 cfs

DO_{stream} = background dissolved oxygen = 7.0 mg/L
DO_{eff} = 5.0 mg/L
DO_{std} = dissolved oxygen criteria from s. NR 102.04(4) = 5.0 mg/L
7-Q_{10} = 6.13 cfs (using 10:1 dilution)
f = 0
DO_o = Initial mixed river DO = $\frac{DO_{eff}*Q_e+DO_{stream}*(7-Q_{10}-Q_e*f)}{Q_e*(1-f)+7-Q_{10}}$ = 7.0 mg/L
T = Receiving water temperatures from s. NR 102.25, Wis. Adm. Code, Table 4 - Ambient Temperatures and Water Quality Criteria for Temperature for Inland Lakes and Impoundments (Southern)

The table below shows the calculated weekly average BOD_5 WQBELs during May – October and November – April. Monthly receiving water temperatures are from s. NR 102.25, Wis. Adm. Code, and are averaged over discharge periods:

Calculated Weekly Average BOD_5 WQBELs

Parameter	May – October	November – April
Effluent Flow (MGD)	0.396	0.396
Flow 7-Q_{10} (cfs)	6.13	6.13
Receiving Water Temperature (°F)	67	40
Receiving Water Temperature (°C)	15	4.5
Effluent DO (mg/L)	5.0	5.0
Background DO (mg/L)	7.0	7.0
Mix DO (mg/L)	6.8	6.8
DO Criterion (mg/L)	5.0	5.0
f	0	0
Concentration Limits (mg/L)	**65**	**92**
Mass Limits (lbs/day)	**304**	**214**

The calculated weekly average BOD_5 limits using the 26-lb method are significantly higher than the categorical effluent limitations that are listed in s. NR 210.05(1), Wis. Adm. Code, and which are currently in effect. For a receiving water that is classified as fish and aquatic life, a publicly owned treatment works shall meet the following limits:

Recommended BOD_5, TSS, pH and DO Limits

	Daily Minimum	Daily Maximum	Weekly Average	Monthly Average
BOD_5			45 mg/L	30 mg/L
TSS			45 mg/L	30 mg/L
pH	6.0 s.u.	9.0 s.u.		
Dissolved Oxygen	N/A			

When categorical BOD_5 limits are given, mass limits for BOD_5 and TSS are not required.

Additionally, **a daily minimum limit for dissolved oxygen is not required** since limiting discharge

levels of BOD_5 ensures that the water quality criterion for dissolved oxygen is met.

PART 4 – 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.

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 975 sample results were reported from January 2019 through March 2025. The maximum reported value was 8.2 s.u. (Standard pH Units). The effluent pH was 7.9 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 7.9 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 7.9 s.u. Therefore, a value of 7.9 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 7.9 s.u. into the equation above yields an ATC = 10.13 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	20
1-Q_{10}	110

The 2×ATC method yields the most stringent limits for Cassville 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)
Weekly and monthly average limits based on chronic toxicity criteria for ammonia are also calculated to determine the weekly and monthly average limits to meet the requirements of s. NR 106.07(3), Wis. Adm. Code. These limits are being re-evaluated because the receiving water flow rate has changed.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code. The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

$$CTC = E \times \{[0.0676 \div (1 + 10^{(7.688 - pH)})] + [2.912 \div (1 + 10^{(pH - 7.688)})]\} \times C$$

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
$C = 1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T = the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used to derive weekly average limitations, and the 30-day criteria are used to derive monthly average limitations, both by a mass-balance using a ten-to-one dilution ratio.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in Jack Oak Slough based on conversations with local fisheries biologists and raw fish data in the Fisheries Management Information System. So “ELS Absent” criteria apply from October through March, and “ELS Present” criteria will apply from April through September for a warm water classification.

The "default" basin assumed values are used for temperature and background ammonia concentrations; pH data for the Mississippi River in Crawford County was used because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.396	0.396	0.396
	Ammonia (mg/L)	0.11	0.06	0.28
	Temperature (°C)	14	21	10
	pH (s.u.)	8.18	8.12	8.18
	Dilution Factor	10	10	10
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	**4.63**	**3.44**	4.66
	Early Life Stages Absent	4.65	3.44	**6.24**
	30-day Chronic			
	Early Life Stages Present	**1.85**	**1.38**	1.87
	Early Life Stages Absent	1.86	1.38	**2.50**
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	**50**	**37**	
	Early Life Stages Absent			**66**
	Monthly Average			
	Early Life Stages Present	**19**	**15**	
	Early Life Stages Absent			**25**

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from January 2022 through December 2022.

Ammonia Nitrogen Effluent Data

Sample Date	Ammonia Nitrogen (mg/L)	Sample Date	Ammonia Nitrogen (mg/L)	Sample Date	Ammonia Nitrogen (mg/L)
01/19/22	0.05	06/15/22	4.47	10/05/22	0.08
02/16/22	<0.05	06/28/22	0.07	11/08/22	0.08
03/22/22	0.17	07/26/22	0.06	12/06/22	0.08
04/19/22	0.05	08/11/22	0.08	12/08/22	0.08
05/18/22	0.35	09/07/22	0.08		
1-day P_{99} = 4.4 mg/L					
4-day P_{99} = 2.7 mg/L					
30-day P_{99} = 1.1 mg/L					

*"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected (ND) result.

Reasonable Potential

The need to include ammonia limits in Cassville Wastewater Treatment Facility's permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia and comparing those to the calculated limits. Based on this comparison, **no limits are required. Monitoring is recommended for at least one year** in order to assess the need for ammonia limits at the next permit reissuance.

Attachment #1

PART 5 – 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. Cassville 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
Cassville Wastewater Treatment Facility has monitored effluent *E. coli* from May 2022 through September 2024, and a total of 57 results are available. A geometric mean of 126 counts/100 mL was not exceeded, and the maximum monthly geometric mean was 17 counts/100 mL. Effluent data has exceeded 410 counts/100 mL one time (which is 2% of the total sample results). The maximum reported value was 480 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 6 – 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 Cassville Wastewater Treatment Facility has phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.

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. The "Mississippi River main channels and side channels" is specifically

listed, therefore, the criterion of 0.10 mg/L applies for Jack Oak Slough since it is considered a side channel to the Mississippi River.

For discharges to waters that do not exhibit a unidirectional flow at the discharge location, effluent limits shall be set equal to the criterion pursuant to s. NR 217.13(3), Wis. Adm. Code. The limit is the same as the previous evaluation because the water is impaired for total phosphorus.

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from January 2019 through March 2025. The chemical phosphorus removal system was completed in May 2022.

Total Phosphorus Effluent Data

	April 2020 through March 2025		**May 2022 through March 2025** (chemical removal was fully implemented)	
	(mg/L)	**(lbs/day)**	**(mg/L)**	**(lbs/day)**
1-day P_{99}	5.23	4.71	2.88	3.39
4-day P_{99}	3.00	2.60	1.64	1.85
30-day P_{99}	1.86	1.49	1.00	0.88
Mean	1.36	1.02	0.72	0.49
Std	1.04	0.95	0.57	0.73
Sample size	975	974	454	453
Range	0.08 - 7.63	0.04 - 6.92	0.08 - 4.29	0.04 - 5.90

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 **0.10 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 0.30 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 to a phosphorus-impaired water (Mississippi River). **This final mass limit shall be 0.10 mg/L × 8.34 × 0.396 MGD = 0.33 lbs/day expressed as a six-month average.**

Water Quality Trading Minimum Control Level
A Water Quality Trading (WQT) plan has been submitted as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the phosphorus WQBELs. If the plan is approved, the phosphorus WQBELs may be expressed as computed compliance limits, but a minimum control level (MCL) must be set as a limit not to be exceeded at the outfall location. The variance interim

limit of **1.0 mg/L as a monthly average**, which went into effect January 1, 2023, **is recommended to serve as the MCL during the reissued permit term.**

PART 7 – 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.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from January 2019 through March 2025.

Temperature Limits by Month

Month	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	87	120
FEB	86	120
MAR	61	87
APR	62	85
MAY	71	88
JUN	77	93
JUL	84	97
AUG	111	120
SEP	90	119
OCT	65	95
NOV	63	119
DEC	NA	120

No thermal monitoring has occurred. Section NR 106.59(2)(b), Wis. Adm. Code, allows the use of temperature effluent data, on a case-by-case basis, from at least two other wastewater treatment facilities within a 100-mile radius that utilize similar wastewater treatment technology and have a similar ratio of domestic to industrial waste stream composition.

Thermal data for Patch Grove Wastewater Treatment Facility (maximum temperatures reported during monitoring from January 2021 through December 2021) and Bloomington Wastewater Treatment Facility

(maximum temperatures reported during monitoring from January 2019 through December 2019) are presented in the table below.

Temperature Effluent Data for Similar Facilities

Month	**Patch Grove WWTF** Representative Highest Monthly Effluent Temperatures		**Bloomington WWTF** Representative Highest Monthly Effluent Temperature	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	46	46	41	41
FEB	39	39	34	35
MAR	45	45	40	40
APR	48	48	48	48
MAY	46	46	54	54
JUN	56	56	62	62
JUL	63	63	69	69
AUG	64	64	71	71
SEP	64	64	70	70
OCT	61	61	69	69
NOV	48	48	47	47
DEC	45	46	46	46

Based on the thermal data from the two similar facilities and the calculated thermal limits for Cassville Wastewater Treatment Facility, **there may be reasonable potential for a weekly average temperature limit in October. Thermal monitoring is necessary in order to determine the need for limits at the next permit reissuance.** The complete thermal table used for the limit calculation is provided in Attachment #3.

PART 8 – 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 tests predict the concentration that interferes with the growth or reproduction of test organisms

during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 9%,** shown in the WET Checklist summary below, was calculated according to the following:

> The IWC is 9% based on dilution of 10 parts lake water to 1 part effluent, as specified in s. NR 106.06(4)(b)2, Wis. Adm. Code, or a factor of 1 in 11 to calculate the IWC.

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	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 9% **0 Points**
Historical Data	No data. **5 Points**	No data. **5 Points**
Effluent Variability	Little variability, no upsets or significant violations, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC. Ammonia nitrogen, arsenic, chloride, copper, nickel, and zinc detected. Additional Compounds of Concern: None. **3 Points**	No reasonable potential for limits based on CTC. Ammonia nitrogen, arsenic, chloride, copper, nickel, and zinc detected. Additional Compounds of Concern: None. **3 Points**
Additives	No biocides and one water quality conditioner (alum but switching to RE-300) added. Permittee has proper P chemical SOP in place for alum but will need to develop one for RE-300. **1 Point**	All additives used more than once per 4 days. **1 Point**
Discharge Category	No industrial contributors. **0 Points**	Same as Acute. **0 Points**
Wastewater Treatment	Secondary or better. **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**14 Points**	**14 Points**

Attachment #1

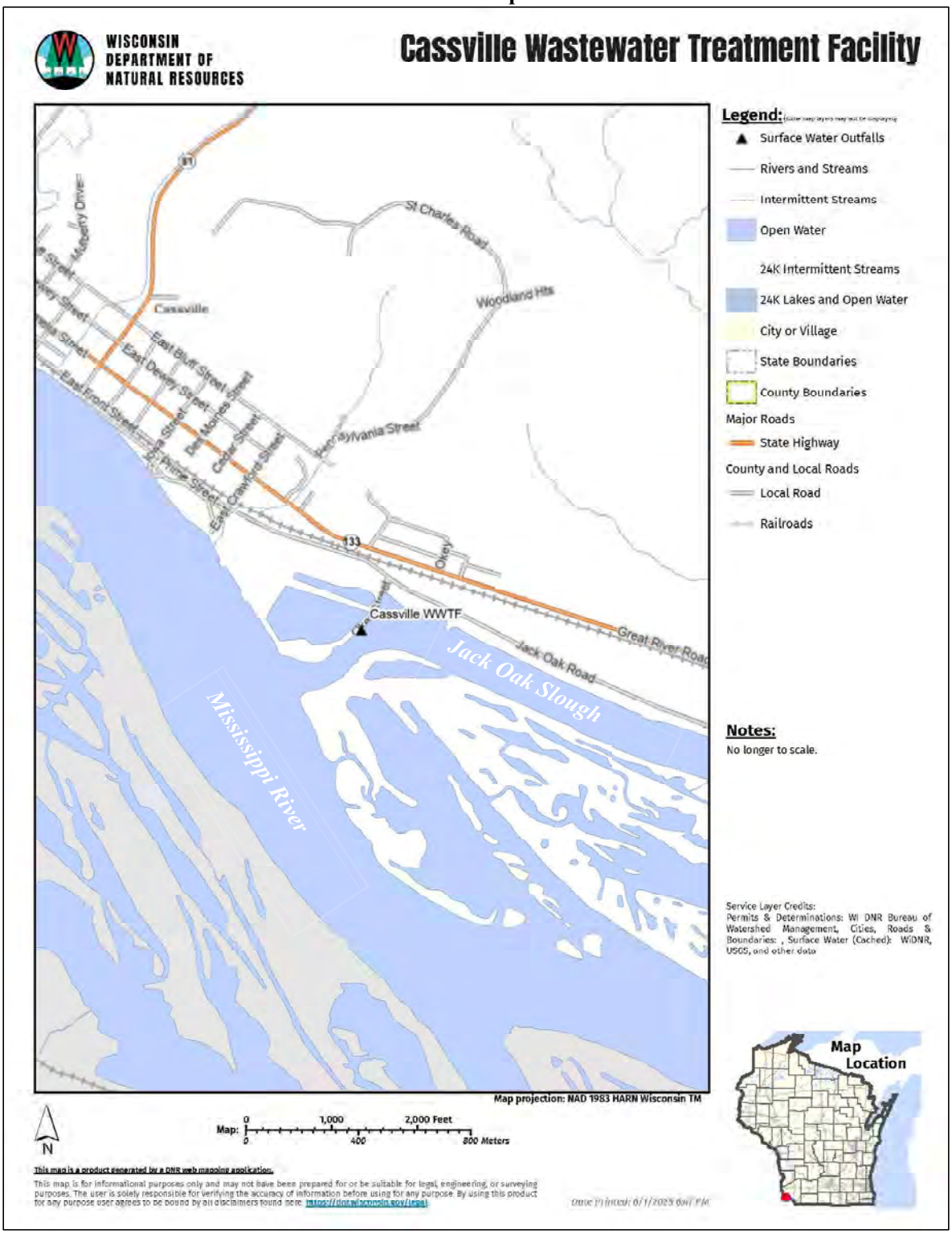
	Acute	Chronic
Recommended Monitoring Frequency (from Checklist):	None.	None.
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

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

- At the time of the writing of this memo, the facility is planning to switch from alum to RE-300 for phosphorus removal. **In order to not be required to perform WET testing, a Standard Operating Procedure (SOP) for RE-300 should be developed and implemented, with a copy submitted to the Department.**

Attachment #2

Site Map



Attachment #3

Temperature limits for receiving waters without unidirectional flow

(calculation using default ambient temperature data)

Facility: Cassville WWTF

Outfall(s): 001

Date Prepared: 5/22/2025

Design Flow (Qe): 0.396 MGD

Lake Type: Southern Inland Lakes

Discharge Type: Inland lake or impoundment shore disch

Flow Dates

Start: 01/01/19

End: 03/31/25

Maximum area of mixing zone allowed (coefficient "A"): 15,708 ft^2

Month	Water Quality Criteria			Representative Highest Effluent Flow Rate (Qe)					Representative Highest Monthly Effluent Temperature		**Calculated Effluent Limit**	
	Ta (default)	Sub-Lethal WQC	Acute WQC	7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)	B	e^{-a} (for SL-WQBEL)	e^{-a} (for A-WQBEL)	Weekly Average	Daily Maximum	**Weekly Average Effluent Limitation**	**Daily Maximum Effluent Limitation**
	(°F)	(°F)	(°F)	(MGD)	(MGD)				(°F)	(°F)	(°F)	(°F)
JAN	35	49	77	0.17	0.20	0.405	0.270	0.343			87	120
FEB	39	52	78	0.17	0.19	0.405	0.276	0.312			86	120
MAR	41	55	78	0.60	0.97	0.405	0.695	0.799			61	87
APR	49	60	80	1.13	1.49	0.405	0.826	0.864			62	85
MAY	58	68	82	0.80	1.00	0.405	0.761	0.804			71	88
JUN	70	75	86	0.80	0.85	0.667	0.694	0.709			77	93
JUL	77	80	87	0.32	0.42	0.667	0.403	0.502			84	97
AUG	76	80	87	0.13	0.21	0.667	0.115	0.250			111	120
SEP	67	73	85	0.19	0.25	0.555	0.258	0.347			90	119
OCT	54	61	81	0.45	0.52	0.405	0.620	0.659			65	95
NOV	42	50	78	0.23	0.29	0.405	0.389	0.467			63	119
DEC	35	49	77	0.08	0.10	0.405	0.066	0.124			NA	120

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

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

10/7/2025

Jared Kasten
P.O. Box 171
Cassville, WI 53806

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Receiving water Jack Oak Slough on the Mississippi River in Grant County
Permittee: Village of Cassville, WPDES WI-0021423

Dear Mr. Kasten:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Village of Cassville Wastewater Treatment Facility in an application dated 9/23/2025. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

After review of the application materials, the Department is tentatively approving coverage under the phosphorus multi discharger variance because the applicant has demonstrated that a major facility upgrade would be required to comply with the phosphorus water quality based effluent limitation, and the applicant meets the economic hardship eligibility criteria delineated in the federally approved variance. In addition, the permitted facility has agreed to comply with the interim limitations that will be included in the WPDES permit, and has agreed to reduce the amount of phosphorus entering surface waters by entering into a binding, written agreement with another person under which the permittee constructs a project or implements a plan to make annual reduction of phosphorus pollution pursuant to s. 283.16(6)(b)3., Wis. Stats.

Pursuant to the MDV Watershed Plan, dated October 2, 2025, Cassville will stabilize eroding streambanks that will prevent an estimated 105.1 pounds of phosphorus from entering waters of the state on an annual basis. Requirements to implement the MDV Watershed Plan will be included in Cassville's reissued WPDES permit under the tracking number MDV-2025-01.

This approval is not to be construed as an approval for water quality trading, and DNR is not issuing approval for the proposed trade ratios, habitat adjustment, and final credit quantities at this time. Additional documentation will be needed, via an updated WQT plan, before approval of water quality trading credits occurs.

This approval does not fulfill permitting requirements under ch. 31, 30 of Wis. Adm. Code or any local permit requirements.

Public comment on this decision will be solicited at the time of permit reissuance after which a final decision will be made. The Department appreciates your attention and interest in Wisconsin's multi-discharger phosphorus variance. Should you have further questions regarding this matter, please contact me at (608) 400 – 5596 or by email at matthew.claucherty@wisconsin.gov.

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Joshua Mergen, Village of Cassville
Jordan Fure, Delta 3 Engineering
Betsyjo Howe, WDNR
Caitlin Oconnell, WDNR
Jennifer Jerich, WDNR
Michelle Woods, EPA Region 5
Tim Elkins, EPA Region 5

State of Wisconsin
Department of Natural Resources
Bureau of Water Quality
Permits Section - WQ/3

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). 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.).

Permittee Name

Village of Cassville

WPDES Permit Number	County
WI- 0 | 0 | 2 | 1 | 4 | 2 | 3	Grant

1. Did the point source apply for the MDV at the appropriate time?	(•) Yes ( ) No. *STOP- facility not eligible at this time.*	*See Questions 1-3.*
2. This operation is (check one):	( ) New or relocated outfall. *STOP- facility not eligible.* (•) Existing outfall	*See Questions 5-6.*
3. Is the point source is located in an MDV eligible area?	(•) Yes ( ) No. *STOP- facility not eligible.*	*Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.*
4. The secondary indicator score for the county (counties) the discharge is located is:	6	*See Appendices A-F. If the score is less than 2, stop; the facility is not eligible. See Q23 on municipal form & Q28 on industrial form.*
5. Is a major facility upgrade required to comply with phosphorus limits?	(•) Yes ( ) No. *STOP- facility not eligible.*	*See Q8 on municipal form/Q9 on industrial form.*
6. List the months where phosphorus limits cannot be achieved during the permit term:	☒ All ☒ Jan ☒ Apr ☒ Jul ☒ Oct ☒ Feb ☒ May ☒ Aug ☒ Nov ☒ Mar ☒ Jun ☒ Sep ☒ Dec	*Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.*

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
001	0.86	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used 2024 data only	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

8. What is the appropriate interim limitation(s) for the permit term?

0.8 mg/L as a monthly average, pursuant to s. 283.16(6)(a)(1), Wis. Stats.
Target Value = 0.2 mg/L

Provide Rationale:

Effluent total phosphorus data from the past three years (9/1/2022 - 8/31/2025, n= 467) yields a 30-day P99 value of 0.86 mg/L. The MDV application indicates that Cassville can achieve 0.5 mg/L, but data indicates this is not occurring regularly. Monthly averages in 2025 vary from 0.3 mg/L to 1.3 mg/L due to variability in treatment performance. The cause of variability may need to be addressed via a schedule.

Note: See description in Section 2.02 of the MDV implementation guidance. Interim limitations should reflect the "highest attainable condition" for the permittee in question pursuant to s. 283.16(7), Wis. Stat.

Save

9. *For Industries Only*- Where does the phosphorus in the effluent come from? (check all that apply)	☐ Process ☐ Additive Usage ☐ Water supply *Can intake credits be given or can the facility use an alternative water supply?* ◯ Not feasible ◯ Possibly, but further analysis needed ◯ Not evaluated at this time	*See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.*
10. Has this facility optimized?	◉ Yes ◯ In progress ◯ No	*See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.)If no will need compliance schedule.*
11. Has a facility plan/compliance alternative plan been completed for the facility?	◉ Yes ◯ In progress ◯ No	*See Q15 on municipal form & Q17 on industrial form.*
12. What is the projected cost for complying with phosphorus? Source:	$ 2,134,325.00 Capital costs from Engineer's Estimate cited in the MDV application. See notes below for notes on validity of estimate.	*Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.*

Comments on planning efforts:

The Cassville Wastewater Treatment Facility was initially issued a low-level phosphours WQBEL (0.1 mg/L) in 2013. Planning efforts thru 2018 (including a final compliance alternatives plan, Delta 3 Engineering, 2018) let to individual phosphorus variance coverage 2019 - 2024. At the current permit issuance, Cassville no longer qualifies for an individual variance. The final compliance mechanism for Cassville is expected to be water quality trading. Cassville currently has several viable projects to be installed in 2026, but not enough credits for full compliance via WQT. Cassville and consultant will continue to search for the remainder of needed offset in in the next permit term.

13. Are adaptive management and water quality trading viable?	◯ Yes ◉ Perhaps. Additional analysis required. ◯ No	*See Q18-21 on municipal form & Q22-25 on industrial form. If additional analyses required, the applicant may need to complete this analysis during the MDV permit term.*
14. Has the point source met the appropriate primary screener?	◉ Yes ◯ No. *STOP- facility not eligible.*	*See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.*

Comments on economic demonstration:

With the MDV application, Cassville provided an itemized engineer's estimate for phosphorus compliance costs. The estimate is for a recirculating sand filter, capital costs of $2,134,325. Recirculating sand filters are not typically able to meet low-level phosphorus effluent limits. However, the 2015 EIA analysis document indicates that Cassville's compliance costs may be around $3.4 million (assuming reactive sand filtration is constructed), so the site-specific cost may be conservatively low. The lower capital costs, financed at a 2.5% CWFP interest rate on a 20-year loan result in annual payments of $136,910.82. With $48,000 annual O&M increases, the total annual cost is $184,910.82, or $166,419.74 for residential households based on a 10% nonresidential use rate. This value, divided amongst 361 households, results in an annual average cost of $461 per user. Current sewer rates average $673.33 annually. Future rates are projected at $1,134.33 annually, or 1.97% of the $57,708 MHI. In Grant County with a secondary indicator score of 6, projected sewer rates at 1% of MHI meets the primary screener. The applicant meets the primary screener.

15. What watershed option was selected?

- ○ County project option. *Complete Section 5.*
- ○ Binding, written agreement with the DNR to construct a project or implement a watershed plan. *Complete Section 4.*
- ◉ Binding, written agreement with another person that is approved by the DNR to construct a project or implement a watershed plan. *Complete Section 4.*

Section 4. Watershed Plan Review

16. MDV Plan Number: *Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.*	MDV-2025-01
17. Did the point source complete Form 3200-148?	◉ Yes ○ No
18. Is the project area in the same HUC 8 watershed as the point of discharge?	◉ Yes ○ No. *STOP- Watershed plan must be updated.*
19. What is the annual offset required? *See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.*	76 lbs/yr
20. Does the plan ensure that the annual load is offset annually?	◉ Yes ○ No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?

- ○ Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- ◉ No.

22. Are other funding sources being used as part of the MDV watershed project?

- ○ Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- ◉ No.

23. Do you have any concerns about the watershed project? *Note: Coordinate with other DNR staff as appropriate.*	○ Yes. *STOP- Watershed plan must be updated.* ◉ No.

Comments:
It is important to note that while the MDV application selected Option B "Binding, written agreement with DNR..." for the watershed project, however because Cassville's project is on private land so it will technically be Option C "binding, written agreement with another entity that is approved by the DNR".

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ _____

See "Payment Calculator" document at
\\central\water\WQWT_PROJECTS\WY_CW_Phosphorus\MDV.

Section 6. Determination

Based on the available information, the MDV application is:

- ◉ Approved
- ○ Request for more information
- ○ Denied

Additional Justification (if needed):

Certification		
Preparer Name	Title	
Matt Claucherty	Water Resources Management Specialist	
Signature of Preparer		Date
Matt Claucherty		10/7/2025

MULTIDISCHARGER VARIANCE WATERSHED PLAN – MILL BRANCH

Submitted: October 2, 2025

Village of Cassville
Wastewater Treatment Facility
WPDES Permit No. WI-0021423-09-0
1022 Jack Oak Road
Cassville, Wisconsin 53806

Prepared by:

Delta 3 Engineering, Inc.

875 S Chestnut St. | Platteville, WI 53818
Phone: (608) 348-5355
mail@delta3eng.biz

www.delta3eng.biz

DELTA 3
EVERY ANGLE COVERED

Project Number: D20-187

TABLE OF CONTENTS

Attachments

I. Executive Summary

This Watershed Plan summarizes the Village of Cassville'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-0021423-09-0. 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 Wastewater Treatment Facility (WWTF) currently treats approximately 0.103 MGD and discharges effluent with an average Total Phosphorus (TP) concentration of approximately 0.47 mg/L. The WWTF plans to continue with chemical Phosphorus treatment and offset the remaining 108 lbs. of TP. Since the WWTF is unable to satisfy the WQT credit requirements for final TP limit compliance, the Village has applied for a Multi-Discharger Variance (MDV) with WQT. Under the MDV the Village will be required to offset **76 lbs** of TP. The Village intends to satisfy the 0.1 mg/L six-month average and 0.3 mg/L monthly average TP limits with a WWTF Upgrade Project and WQT.

NRCS Streambank Erosion modeling methods were used to calculate the TP 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 offset approximately 105.1 lbs of TP under the MDV which equates to 41 WQT credits towards final TP compliance. The implementation of this WQT Plan will result in compliance with the MDV 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 Watershed Plan will be submitted at that time for new BMP practices and credit production.

Table 1.1 – Modeling Results

ID	Lateral Recession Rate (ft/yr.)	Current Phosphorus Loading (lbs./yr.)	Proposed Phosphorus Loading (lbs./yr.)	Proposed Phosphorus Reductions (lbs./yr.)	MDV Trade Ratio	MDV Phosphorus Offset	Final Trade Ratio	Final Phosphorus Credits
R	0.25	4.8	0	4.8	1:1	4.8	2.84:1	2
Q	0.25	2.5	0	2.5	1:1	2.5	2.84:1	1
P	0.30	1.6	0	1.6	1:1	1.6	2.84:1	1
O	0.25	10.9	0	10.9	1:1	10.9	2.84:1	4
N	0.15	0.8	0	0.8	1:1	0.8	2.84:1	0.5
M.1	0.35	1.6	0	1.6	1:1	1.6	2.84:1	1
M.2	0.35	3.8	0	3.8	1:1	3.8	2.84:1	1
M.3	0.30	1.6	0	1.6	1:1	1.6	2.84:1	1
M.4	0.30	5.8	0	5.8	1:1	5.8	2.84:1	2
L	0.35	7.7	0	7.7	1:1	7.7	2.84:1	3
K	0.30	5.9	0	5.9	1:1	5.9	2.84:1	2
J	0.35	2.8	0	2.8	1:1	2.8	2.84:1	1
I	0.30	3.1	0	3.1	1:1	3.1	2.84:1	1
H	0.40	1.6	0	1.6	1:1	1.6	2.84:1	1
G	0.35	3.1	0	3.1	1:1	3.1	2.84:1	1
F	0.25	2.7	0	2.7	1:1	2.7	2.84:1	1
C	0.40	10.6	0	10.6	1:1	10.6	2.84:1	4
A.1a	0.40	2.9	0	2.9	1:1	2.9	2.84:1	1
A.1b	0.35	1.6	0	1.6	1:1	1.6	2.84:1	1
A.1c	0.20	0.8	0	0.8	1:1	0.8	2.84:1	0.5
A.1d	0.30	1.0	0	1.0	1:1	1.0	2.84:1	0.5
A.1e	0.30	1.7	0	1.7	1:1	1.7	2.84:1	1
A.1f	0.35	0.9	0	0.9	1:1	0.9	2.84:1	0.5
A.1g	0.50	4.8	0	4.8	1:1	4.8	2.84:1	2
A.1h	0.50	3.1	0	3.1	1:1	3.1	2.84:1	1
A.1i	0.50	1.6	0	1.6	1:1	1.6	2.84:1	1
A.3	0.25	12.6	0	12.6	1:1	12.6	2.84:1	4
A	0.30	3.2	0	3.2	1:1	3.2	2.84:1	1
					Total	**105.1**		**41**

NOTE:

MDV Trade Ratio = 1:1

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

Delivery Factor = (1 / *Delivery Fraction*) – 1 = 0.04

Delivery Fraction = 1 – ((user del_frac – generator del_frac) / user del_frac)

Downstream = 0.8 (For trades downstream of Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty: *Streambank Stabilization with Habitat Restoration* = 2

II. **Background**

The purpose of this Watershed 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-0021423-09-0. The Plan was developed following the Notice of Intent to Conduct Water Quality Trading, provided in Attachment #1. The Water Quality Trading Checklist Form 3400-208 is provided in Attachment #2.

The Village of Cassville (Village) is a small rural community located along Wisconsin State Highway '133' and Wisconsin State Highway '81' in Grant County, Wisconsin. The Village is located in Sections 19, 20, 28 and 29, Town 3 North, Range 5 West of the Fourth Principal Meridian. The Village is situated on a flatter plain area located between the river bluffs and the Mississippi River with the grade sloping throughout the area at normally two (2) percent or less. Elevations in the area range from approximately 625'± at the southeast end of the Village to 640'± at the northeast end of the Village. The 100-year regional flood elevation for Cassville is at USGS Elevation = 619.0'. The topography of the area is shown in Attachment #3.

The existing sanitary sewer system currently serves a population of approximately 777 people and consists of approximately 3,800 feet of 10" and 30,000 feet of eight-inch (8") gravity sanitary sewer with 158 manholes. Two (2) lift stations are utilized throughout the collection system, with approximately 1,100 feet of force main to assist with the transport of wastewater to the Wastewater Treatment Facility (WWTF). Please refer to Attachment #4 – Sanitary Sewer Map for location of sanitary sewer collection system components.

The Village of Cassville owns and operates a WWTF consisting of a headworks building through which wastewater is passed through a raw pump station, screening, grit removal, and a Parshall flume. From the headworks, wastewater flows into the contact-stabilization activated sludge package plant, which includes an aeration tank, final clarifier, and aerated sludge holding tank. UV disinfection is utilized prior to discharge of the effluent. Sludge removed in the package plant's final clarifier is aerobically digested and stored on site prior to land application. Currently, Alum is added to assist in the removal of Phosphorus. The receiving water and effluent discharge location is Jack Oak Slough/Mississippi River (Mississippi River Watershed, GP07 – Grant-Platte River Basin). The WWTF currently treats 0.103 MGD on an annual average with a design flow of 0.396 MGD as listed in the WPDES Permit. Please see Attachment #5 for the WWTF Flow Schematic.

The monthly average influent and effluent flows and loadings at the WWTF for 2022, 2023, and 2024 are provided in Table 2.1, Table 2.2, and Table 2.3, respectively. An annual summary table is provided in Table 2.4.

Table 2.1 – 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)	0.057	139	5	177	16	-	2.20	1.05
Feb. ('22)	0.066	212	9	174	16	-	2.12	1.17
Mar. ('22)	0.060	198	5	236	7	-	2.24	1.12
Apr. ('22)	0.095	148	6	146	11	-	2.01	1.59
May ('22)	0.114	221	7	233	17	-	1.90	1.81
June ('22)	0.079	182	3	213	10	-	1.30	0.86
July ('22)	0.047	140	2	161	4	-	1.14	0.45
Aug. ('22)	0.050	123	3	163	5	-	1.51	0.63
Sept. ('22)	0.051	82	2	116	5	-	0.95	0.40
Oct. ('22)	0.048	140	3	157	7	-	1.05	0.42
Nov. ('22)	0.061	114	3	180	8	-	0.91	0.46
Dec. ('22)	0.045	202	4	203	10	-	0.66	0.25
Annual Average =	**0.064**	**158**	**4**	**180**	**10**	**-**	**1.50**	**0.85**

Table 2.2 – 2023 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. ('23)	0.051	128	4	142	9	-	0.53	0.24
Feb. ('23)	0.044	164	12	187	22	-	1.05	0.40
Mar. ('23)	0.050	134	4	156	10	-	0.37	0.16
Apr. ('23)	0.425	86	5	111	19	-	0.79	1.83
May ('23)	0.369	49	3	67	12	-	0.54	1.96
June ('23)	0.057	95	3	137	6	-	0.67	0.29
July ('23)	0.055	156	2	203	5	-	0.94	0.39
Aug. ('23)	0.049	104	2	154	7	-	1.12	0.47
Sept. ('23)	0.050	110	2	212	4	-	0.68	0.22
Oct. ('23)	0.048	94	2	146	6	-	0.93	0.37
Nov. ('23)	0.053	116	4	169	14	-	0.57	0.27
Dec. ('23)	0.050	164	3	225	11	-	0.46	0.24
Annual Average =	**0.108**	**117**	**4**	**159**	**10**	**-**	**0.72**	**0.57**

Table 2.3 – 2024 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. ('24)	0.052	162	4	193	10	-	0.36	0.15
Feb. ('24)	0.048	236	3	334	6	-	0.35	0.14
Mar. ('24)	0.051	212	7	231	20	-	0.61	0.27
Apr. ('24)	0.061	368	8	614	14	-	0.53	0.27
May ('24)	0.099	267	3	444	8	-	0.44	0.38
June ('24)	0.207	149	5	254	27	-	0.74	0.97
July ('24)	0.435	75	2	113	8	-	0.27	1.10
Aug. ('24)	0.067	250	3	477	5	-	0.38	0.20
Sept. ('24)	0.052	389	4	756	6	-	0.64	0.27
Oct. ('24)	0.050	368	3	457	6	-	0.64	0.26
Nov. ('24)	0.057	236	3	332	8	-	0.37	0.18
Dec. ('24)	0.058	129	3	266	7	-	0.33	0.15
Annual Average =	**0.103**	**237**	**4**	**373**	**10**	**-**	**0.47**	**0.36**

Table 2.4 – Annual Averages

Year	Flow	Total Phosphorus	Total Phosphorus
	(MGD)	(mg/L)	(lbs./day)
	Effluent	Effluent	Effluent
2022	0.064	1.50	0.85
2023	0.108	0.72	0.57
2024	0.103	0.47	0.36

Currently, the Village has been able to maintain an average Total Phosphorus effluent of 0.47 mg/L which is well within the WPDES interim limit of 1.0 mg/L. The Village has also implemented source reduction measures such as investigating potential TP contributors. With the recent closing of the Alliant Energy's Nelson Dewey Generating Station and abrupt closing of the DTE E.J. Stoneman Generating Station, the Village of Cassville has no major industrial contributors to its wastewater treatment facility.

The Village has investigated watershed compliance alternatives such as Water Quality Trading (WQT) and Adaptive Management (AM). Stream monitoring from 2007-2017 confirmed that the Mississippi River was an impaired water due to TP. The background TP concentration was monitored upstream from Outfall 001 near Lynxville, WI. As calculated in the Water Quality Based Effluent Limit (WQBEL) on March 8, 2018, the rolling median TP concentration was 0.149 mg/L. The median average was almost 1.5x the applicable Water Quality Standard (WQS) of 0.1 mg/L. Following discussion with the DNR and initial investigation, the Village elected to move forward with WQT. Therefore, the Village intends to perform WQT projects downstream of the outfall and within the Village's Hydrological Unit Code – 12 (HUC-12) watershed #070600030706 as provided in Attachment #6.

Flow and loading data from 2024 was utilized to determine credits needed. Annual effluent TP was estimated at 139 lbs. based off of monthly loadings. The final limit would allow annual discharge of 31 lbs. The Village would be required to offset at least 76 lbs of effluent TP under an MDV and 108 lbs for final compliance. However, the Village intends to install an effluent filter to help meet the final TP limits. Calculations for required WQT reductions are provided below.

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

Table 2.5 – 2024 Phosphorus Discharge Load

	Total Flow	Average Phosphorus Concentration	Monthly Phosphorus Load
	(MGD)	(mg/L)	(lbs./month)
	Effluent	Effluent	Effluent
Jan. ('24)	1.625	0.36	4.88
Feb. ('24)	1.406	0.35	4.10
Mar. ('24)	1.567	0.61	7.97
Apr. ('24)	1.837	0.53	8.12
May ('24)	3.081	0.44	11.31
June ('24)	6.223	0.74	38.41
July ('24)	13.485	0.27	30.37
Aug. ('24)	2.073	0.38	6.57
Sept. ('24)	1.555	0.64	8.30
Oct. ('24)	1.556	0.64	8.31
Nov. ('24)	1.712	0.37	5.28
Dec. ('24)	1.791	0.33	4.93
		Total =	**139**

Total Annual Phosphorus Load in 2024 = 139 lbs./yr.

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

Seasonal Average Daily Flow (Q) = 0.103 MGD
Proposed Seasonal Phosphorus Concentration Limit = 0.2 mg/L

0.103 MGD x 0.2 mg/L x 8.34 x 365 days/yr. = **63 lbs./yr**.

3) The proposed allowable annual Phosphorus mass limit at the WWTF for final TP compliance is calculated as follows:

Seasonal Average Daily Flow (Q) = 0.103 MGD
Proposed Seasonal Phosphorus Concentration Limit = 0.1 mg/L

0.103 MGD x 0.1 mg/L x 8.34 x 365 days/yr. = **31 lbs./yr**.

4) Reduction of Total Phosphorus required at WWTF under MDV:

139 lbs./yr. – 63 lbs./yr. = **76 lbs./yr**.

5) Reduction of Total Phosphorus required at WWTF for final compliance:

139 lbs./yr. – 31 lbs./yr. = **108 lbs./yr**.

To demonstrate compliance through WQT, the Village intends to perform streambank stabilization in combination with a Multi-Discharger Variance (MDV).

Additionally, the Village intends to construct an effluent filter at the WWTF to polish effluent TP to levels below 0.1 mg/L. Once the effluent filter is operational, the WQT credits will be used to help meet compliance during effluent filter maintenance/repair.

III. Location and Description of Credit Generation Sites

The Village discharges to the Jack Oak Slough/Mississippi River (Mississippi River Watershed, GP07 – Grant-Platte River Basin) at Outfall 001. As mentioned previously, the Village intends to perform WQT projects within the Village's HUC-12 #070600030706. The Village plans to perform streambank stabilization which will utilize grading and/or riprap to prevent the erosion of sediment from the streambanks. Projects will occur on private property. Streambank stabilization will not only prevent sediment from entering the stream, but will also prevent phosphorus, nitrogen, and other pollutants from discharging to the Mississippi River. See Figure 3.1 for additional project location information.

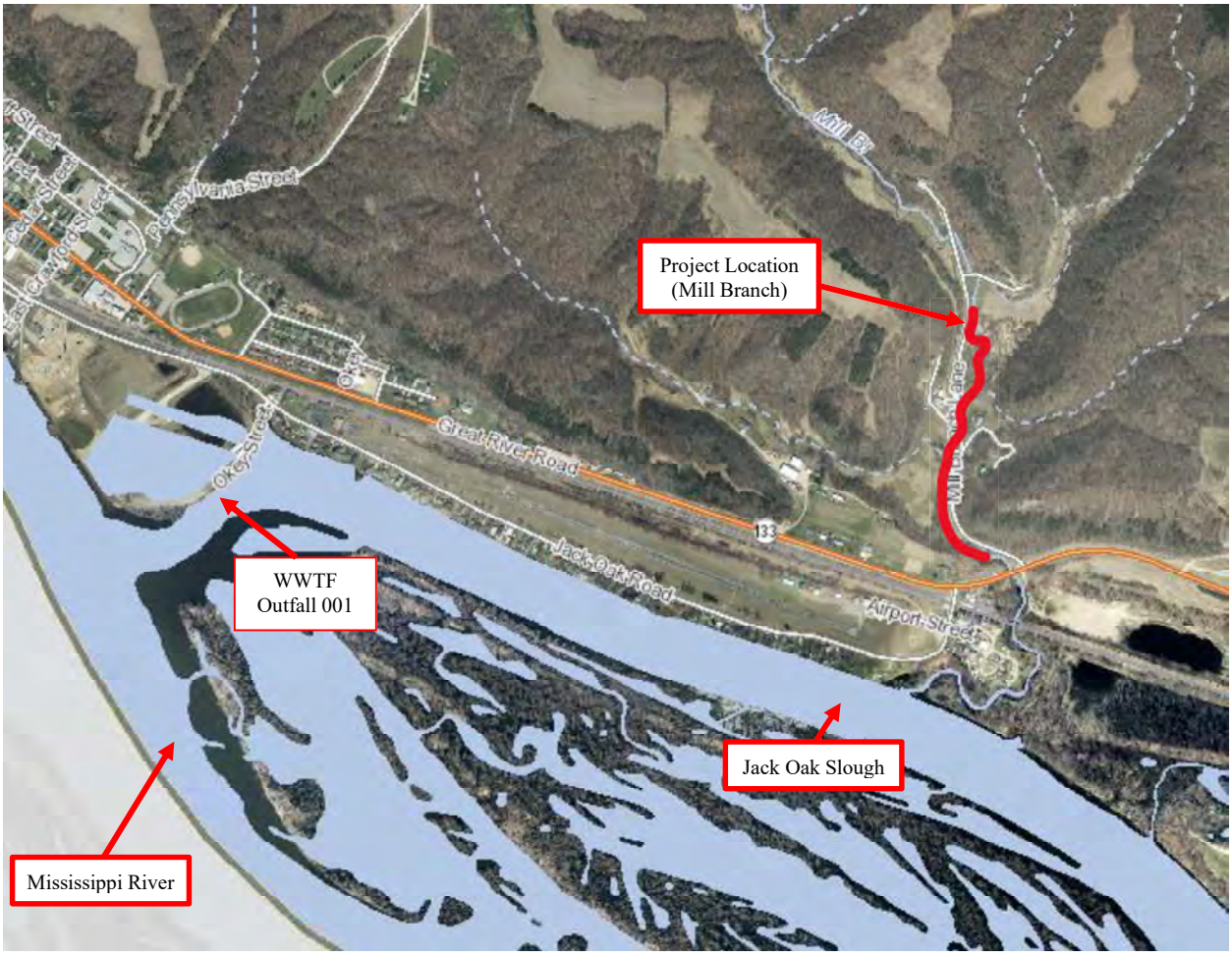


Figure 3.1 – Project location in relation to Outfall 001

IV. Methods for Nonpoint Source Load Reduction

A. Methods Used to Generate Load Reductions

The project location described above was inspected by a Professional Engineer in order to identify locations of severe erosion along the Mill Branch. Signs to identify severe erosion include but are not limited to: streambanks missing vegetation, presence of slumps and rills, tree roots extruding from the streambank, fallen trees as a result of soil being eroded from underneath the trunk. The primary method to remediate the erosion sites is to re-grade the existing streambanks for the length of the active erosion to a more stable slope of 6:1. At a 6:1 slope, streambanks with vegetation alone are generally able to inhibit erosion from flowing rivers and streams under ordinary circumstances. The use of riprap as a method to remediate the actively eroding streambanks allows us to protect the streambanks from erosion and retain a steeper slope of 2:1 because the riprap is able to absorb and deflect the energy of the flowing water. The advantage of re-grading the streambank at a steeper slope is that less material will have to be excavated and removed from the site for construction. A cost analysis was performed to balance the use of riprap and standard re-grading. Additionally, the use of riprap allows us keep from infringing on property lines, roadways, and agriculture fields.

The Watershed Plan identifies streambank stabilization practices that will reduce TP runoff from nonpoint sources. The Village has the ability to generate TP load reductions through streambank grading and/or rip-rap of approximately 1,323 lineal feet of streambank.

Streambank Stabilization will be performed as per NR 328 *Shore Erosion Control Structures in Navigable Waterways and* NRCS 580 *Streambank and Shoreline Protection*. Streambank shaping will eliminate the discharge of sediment to the stream. The streambank stabilization project will occur within HUC-12 #070600030706 in order to generate TP credits. Standard Plans and Specifications for the Project Site will be provided by a Professional Engineer. The Village 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*. A draft Water Quality Trade Agreement is provided in Attachment #7 and shall be executed upon approval of this Watershed Plan and prior to use of Water Quality Trading Credits.

B. History of Project Site

The Project is planned within the Mississippi River Watershed. The project location is along the Mill Branch on private properties. Land use consists of rural property and undeveloped land with vegetative cover being a mix of 70% forest, 20% un-pastured grassland and 10% pastured grassland. No mapped wetlands will be impacted by the

WQT Project as indicated in Attachment #8 – Wetland Map. No fill shall be deposited within floodplain or wetlands.

The streambanks have experienced significant erosion as the watershed has been cleared for residential and agricultural use. Residential development and agricultural practices caused long term deposition of silt within the floodplain followed by decades of stream morphology eroding a new channel through the deposition. The banks within the project location are generally outside bends of the stream which receive higher stream velocity and thus have a higher erosion potential.

The banks are bare with slumps, rills, and severe vegetative overhang throughout. Severe erosion indicators such as undercuts, slumps, tree roots, and fallen trees are readily visible throughout the site. The erosion indicators demonstrate the lateral recession rate based on the NRCS Recession Rate Table.

Erosion sites C, F, G, H, I, J, R, and K are located within a pastured land use area. Livestock with access to these sites shall be restricted to the practices identified in the provided Grazing Plan in order to protect the riparian. The Grazing Plan was written in accordance to NRCS 110 Conservation Planning Activity and the Grant County Conservation Department. Per the Grant County Conservation Department, a maximum of one (1) Animal Unit (AU) per Acre should be followed to conserve forage and prevent erosion. Please refer to Attachment #9.

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 2.84 was calculated. The trade ratio was derived in accordance with Section 3.4 of the Wisconsin Department of Natural Resources' *Guidance for Implementing Water Quality Trading in WPDES Permits (Edition 2)* as follows:

MDV Trade Ratio =

For the given WQT practice under the MDV, a trade ratio of 1:1 was utilized.

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

Delivery Factor = (1 / *Delivery Fraction*) – 1 = 0.04

Delivery Fraction = 1 – ((user del_frac – generator del_frac) / user del_frac)

Downstream = 0.8 (For trades downstream of Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty: *Streambank Stabilization with Habitat Restoration* = 2

Downstream trade factors were determined by Table 4.1 as provided by the Wisconsin DNR.

Table 4.1 – Downstream Trading Factor

Percent Difference Between Credit User's Load and Total Load at the Point of the Credit User's Point of Standards Application	Downstream Trading Factor
<25%	0.1
<50%	0.2
<75%	0.4
≥75%	0.8

Percent Difference = (1- (Qe x Ce) / (Qe x Ce + Qs x Cs)) x 100 = 100%
100% ≥ 75%
Downstream Trading Factor = 0.8

Qs = Receiving water flow (7Q2) = 16,000 cfs
Qe = Design Flow = 0.396 MGD = 0.613 cfs
Cs = Background concentration of TP = 0.100 mg/L
Ce = Effluent concentration of TP = 0.47 mg/L

The Village performed background TP testing on the Mill Branch in 2025 and results are provided in Table 4.2 below. As demonstrated in the stream monitoring data, the stream exceeds the Water Quality Criteria (WQC) of 0.075 mg/L for Total Phosphorus. In-stream samples were collected on the upstream side of the Mill Branch Lane bridge. Please see below for the sampling procedures that were followed:

1. Locate a sampling location that is at least 10 to 20 feet away from a bridge crossing, in the middle of the stream channel, and is at least knee deep. Walk upstream to the sampling location. This ensures the sample is not contaminated by sediment that has been dislodged from the substrate.
2. Facing upstream, rinse a 250 mL nutrients bottle three times with the water to be sampled. Rinse with water three (3) to six (6) inches below the surface.
3. Avoid touching the bottle or inside of the cap.
4. Fill the bottle completely, three (3) to six (6) inches below the surface.
5. Add one 2.0 mL vial of H_2SO_4, cap, and invert the bottler several times.
6. Label the bottle with the appropriate field number and sampling location, and check the box on the label indicating that H_2SO_4 has been added as a preservative. Circle "Nutrients" indicating the bottle has been sampled for nutrients.
7. Store bottles on ice to be transported to LV Laboratories. Total Phosphorus samples must reach the lab within 28 days of sampling.
8. Record date, time, and notes at the time of sampling.

Table 4.2 – Mill Branch Monitoring Data

Date of Sample Collected	TP Concentration (mg/L)
6/19/2025	0.25
6/26/2025	0.81
7/10/2025	0.28
7/23/2025	0.11
9/16/2025	0.46
*	
Average	0.42
Median	0.37

*Additional samples to be taken in October 2025

Per 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)*, in-stream habitat structures may be installed to reduce the uncertainty factor from 3 to 2.

Habitat restoration will consist of 7 bed logs installed approximately every 300 feet of the Project limits. Bed log locations are provided on Plan Sheets in Attachment #14. Furthermore, 13 swamp white oaks will be planted within the riparian area to maintain canopy cover to maintain stream metabolism. Bed logs will provide the following habitat benefits:

- Increase roughness within the channel which creates current breaks, shelter, and resting areas for aquatic organisms.
- The log will provide an environment beneficial for algae, macroinvertebrates, and other aquatic organisms that support aquatic food chains.
- Reduce water velocity and ability of the flow to erode and carry sediment.

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 4.3. 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 the number of credits generated.

Table 4.3 – Modeling Results

ID	Lateral Recession Rate (ft/yr.)	Current Phosphorus Loading (lbs./yr.)	Proposed Phosphorus Loading (lbs./yr.)	Proposed Phosphorus Reductions (lbs./yr.)	MDV Trade Ratio	MDV Phosphorus Offset	Final Trade Ratio	Final Phosphorus Credits
R	0.25	4.8	0	4.8	1:1	4.8	2.84:1	2
Q	0.25	2.5	0	2.5	1:1	2.5	2.84:1	1
P	0.30	1.6	0	1.6	1:1	1.6	2.84:1	1
O	0.25	10.9	0	10.9	1:1	10.9	2.84:1	4
N	0.15	0.8	0	0.8	1:1	0.8	2.84:1	0.5
M.1	0.35	1.6	0	1.6	1:1	1.6	2.84:1	1
M.2	0.35	3.8	0	3.8	1:1	3.8	2.84:1	1
M.3	0.30	1.6	0	1.6	1:1	1.6	2.84:1	1
M.4	0.30	5.8	0	5.8	1:1	5.8	2.84:1	2
L	0.35	7.7	0	7.7	1:1	7.7	2.84:1	3
K	0.30	5.9	0	5.9	1:1	5.9	2.84:1	2
J	0.35	2.8	0	2.8	1:1	2.8	2.84:1	1
I	0.30	3.1	0	3.1	1:1	3.1	2.84:1	1
H	0.40	1.6	0	1.6	1:1	1.6	2.84:1	1
G	0.35	3.1	0	3.1	1:1	3.1	2.84:1	1
F	0.25	2.7	0	2.7	1:1	2.7	2.84:1	1
C	0.40	10.6	0	10.6	1:1	10.6	2.84:1	4
A.1a	0.40	2.9	0	2.9	1:1	2.9	2.84:1	1
A.1b	0.35	1.6	0	1.6	1:1	1.6	2.84:1	1
A.1c	0.20	0.8	0	0.8	1:1	0.8	2.84:1	0.5
A.1d	0.30	1.0	0	1.0	1:1	1.0	2.84:1	0.5
A.1e	0.30	1.7	0	1.7	1:1	1.7	2.84:1	1
A.1f	0.35	0.9	0	0.9	1:1	0.9	2.84:1	0.5
A.1g	0.50	4.8	0	4.8	1:1	4.8	2.84:1	2
A.1h	0.50	3.1	0	3.1	1:1	3.1	2.84:1	1
A.1i	0.50	1.6	0	1.6	1:1	1.6	2.84:1	1
A.3	0.25	12.6	0	12.6	1:1	12.6	2.84:1	4
A	0.30	3.2	0	3.2	1:1	3.2	2.84:1	1
					Total	**105.1**		**41**

NOTE:

MDV Trade Ratio = 1:1

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

Delivery Factor = (1 / *Delivery Fraction*) – 1 = 0.04

Delivery Fraction = 1 – ((user del_frac – generator del_frac) / user del_frac)

Downstream = 0.8 (For trades downstream of Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty: *Streambank Stabilization with Habitat Restoration* = 2

A section of the Mill Branch was surveyed by a licensed Professional Engineer for areas of erosion. Each erosion site identified was measured for average height of erosion, length of erosion, and rate of erosion. Bank heights were hand measured with a tape measure and recorded approximately every 50' for each site. All erosion sites were categorized with a corresponding ID. The data, narrative, and photos documenting the current state of eroding streambanks are provided in Attachment #10.

Soil testing has been completed to determine TP concentrations within the soil at each erosion site. A composite sample was gathered for each site ID. Sampling included the use of a soil sampler which pulled ¾" cores at 8" depth. Cores were taken from each soil horizon throughout the length of the eroding bank to obtain a representative soil sample for the corresponding streambank ID. Soils maps and soil testing data are provided in Attachment #11.

With the collected data, the NRCS Streambank Erosion Estimator was used to calculate TP loss from each site of the eroding streambank. The lateral recession rate of the eroding bank is a critical component for the NRCS Streambank Erosion Estimator. Lateral recession rate was estimated based on the on-site evaluation, photos, and site descriptions. The modeling data for the NRCS Streambank Erosion Estimator is available in Attachment #12. The streambank grading design will eliminate streambank erosion thus eliminating TP inputs within the Project areas.

E. Operation and Maintenance

An Operation and Maintenance (O&M) Plan is provided in Attachment #13. 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, BMP Inspection, Noncompliance Notification, and Notification of Trade Agreement Termination.

As previously mentioned, the Village is planning to perform streambank stabilization by implementing BMPs along the Mill Branch streambanks. The stabilization practices will be installed and maintained per the Plans and Specifications as provided in Attachment #14. BMPs are to follow NR 328 Shore Erosion Control Structures in Navigable Waterways and NRCS 580 Streambank and Shoreline Protection. Restoration landscaping and seeding will be installed following construction and will be closely monitored for a minimum of two (2) growing seasons to ensure the new seeding grows and erosion is not prevalent. Weeds and invasive vegetation growth will be addressed if present. The BMP will be inspected following heavy rain events at a minimum. Inspection will be used to determine appropriate actions in order to maintain the BMP for continuous and ongoing streambank stabilization and TP credit generation.

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

V. Trade Timeline

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

Table 5.1 – Trade Timeline

Item	Completion Timeline
Site Investigation	Summer/Fall 2024
Conceptual Design	Fall 2024
Final Design	September 2025
Construction Permits	Fall 2025
DNR Review of Final Design	Fall 2025
Construction of BMPs	Spring 2026
Phosphorus Credit Registration	June 30, 2026
Use of Phosphorus Credits (Ongoing for Permit Compliance)	July 1, 2026

Credits will be used by the Village following DNR reissuance of the WPDES Permit. 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. Vegetative and Structural Conditions of the streambanks
v. Issues identified
vi. When and how any issues identified were addressed
vii. When and how any issues identified will be addressed in the future
viii. Photos of each BMP

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 the DNR. Annual inspections by a professional engineer will typically occur in Spring. 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 and site photos for each BMP;
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 Watershed 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 Watershed 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 Watershed 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 Watershed Plan remain in effect. Notification to the property owner prior to access is required.

VII. Certification

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

Village of Cassville Wastewater Treatment Facility

By: 

Josh Mergen
Director of Public Works
Village of Cassville
100 W. Amelia Street
P.O. Box 171
Cassville, WI 53806
Telephone: (608) 725-5180
Email: publicworksdirector@cassvillevlgwi.gov

Attachment #1

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.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 Cassville	WI- 0021423	

Facility Address	City	State	ZIP Code
1022 Jack Oak Road	Cassville	WI	53806

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

Project Name
Furnace Branch Improvements and Alliant Energy Solar Field

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Mississippi River	Total Phosphorus	070600030706

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: 070600030707
- ○ No
- ○ Unsure

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

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

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

Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
○ 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

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

List the practices that will be used to generate credits:

Streambank Stabilization - NRCS Streambank Erosion Estimator

Converting crop field to solar field - Snap-Plus

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

Projected date credits will be available: 12/31/2023

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Jordan Jones	5/5/22

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
Kevin E. Williams	5-9-22

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 Cassville	WI- 0021423	

Facility Address	City	State	ZIP Code
1022 Jack Oak Road	Cassville	WI	53806

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 2024 Stream Improvements - Mill Branch

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Mississippi River	Total Phosphorus	070600030706

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
Jaden Fine	4-25-25

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
Joshua J. M	04/25/25

Attachment #3

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Topography Map

Legend: (some map layers may not be displayed)

- 24K Lakes and Open Water
- 24K Streams and Rivers
- 24K Intermittent Streams

24K USGS DRGs

0
1
2
3
4
5
6
8
9
10
11

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

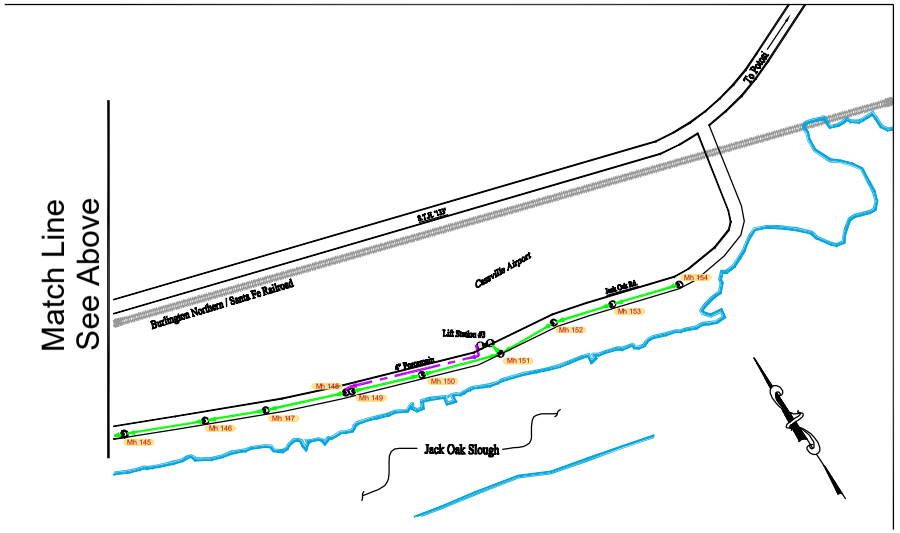
N

Map: 0 925 1,850 Feet
0 275 550 Meters

Service Layer Credits:
EN Basic Basemap WTM Ext: , Topographic Maps:

Date Printed: 1/8/2025 1:25 PM

Attachment #4



Sanitary Sewer System Map

Village of Cassville
Cassville, Wisconsin

Legend

- Known Existing Lateral
- Existing 8" Sanitary Sewer
- Existing 10" Sanitary Sewer
- Existing 12" Sanitary Sewer
- Existing Sanitary Force Main (Size Labeled)
- Corporate Limits
- L.S.1 — Existing Lift Station
- Mh 1.1 — Existing Sanitary Manhole
- Mississippi River

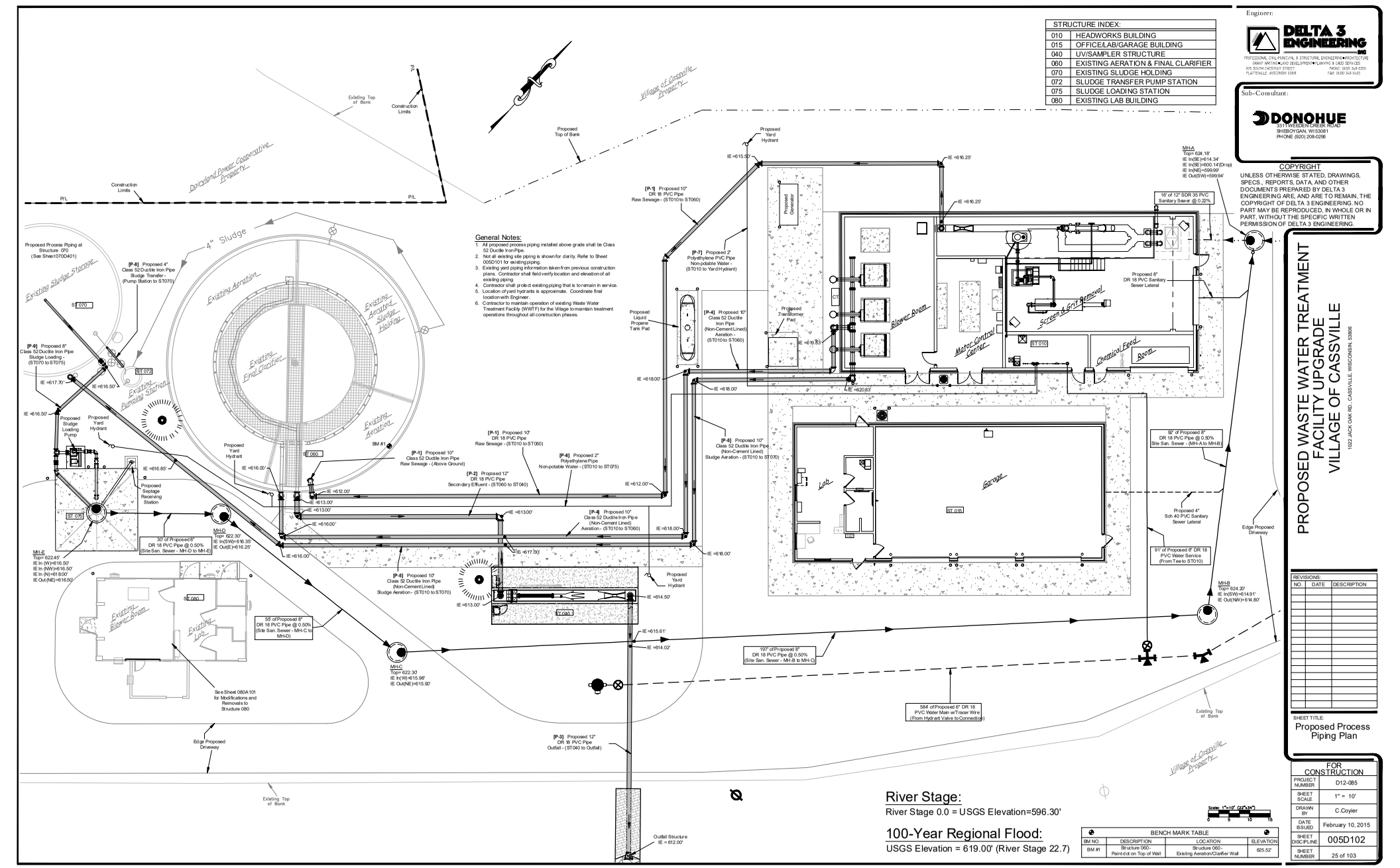
SCALE: 1"=600'
0 300 600

Drawn by: C.Coyier
Date: May 23, 2012

Revised by: C. Coyier
Date: Nov. 25, 2015

DELTA 3 ENGINEERING INC
Professional Civil–Municipal & Structural Engineering
Grant Writing Land Development Planning & CADD Services
875 South Chestnut Street Phone: (608) 348–5355
Platteville, Wisconsin 53818 Fax: (608) 348–5455

Attachment #5



Engineer:
DELTA 3 ENGINEERING
PROFESSIONAL CIVIL-MUNICIPAL & STRUCTURAL ENGINEERING • ARCHITECTURE
DRAFTING • LAND DEVELOPMENT • PLANNING & CAD SERVICES
825 SOUTH CHESTNUT STREET PHONE: (608) 348-5555
PLATTEVILLE, WISCONSIN 53818 FAX: (608) 348-5455

Sub-Consultant:
DONOHUE
3911 WEIDNER CREEK ROAD
SHEBOYGAN, WI 53081
PHONE (920) 208-0296

PROPOSED WASTE WATER TREATMENT FACILITY UPGRADE VILLAGE OF CASSVILLE

1022 JACK OAK RD., CASSVILLE, WISCONSIN, 53806

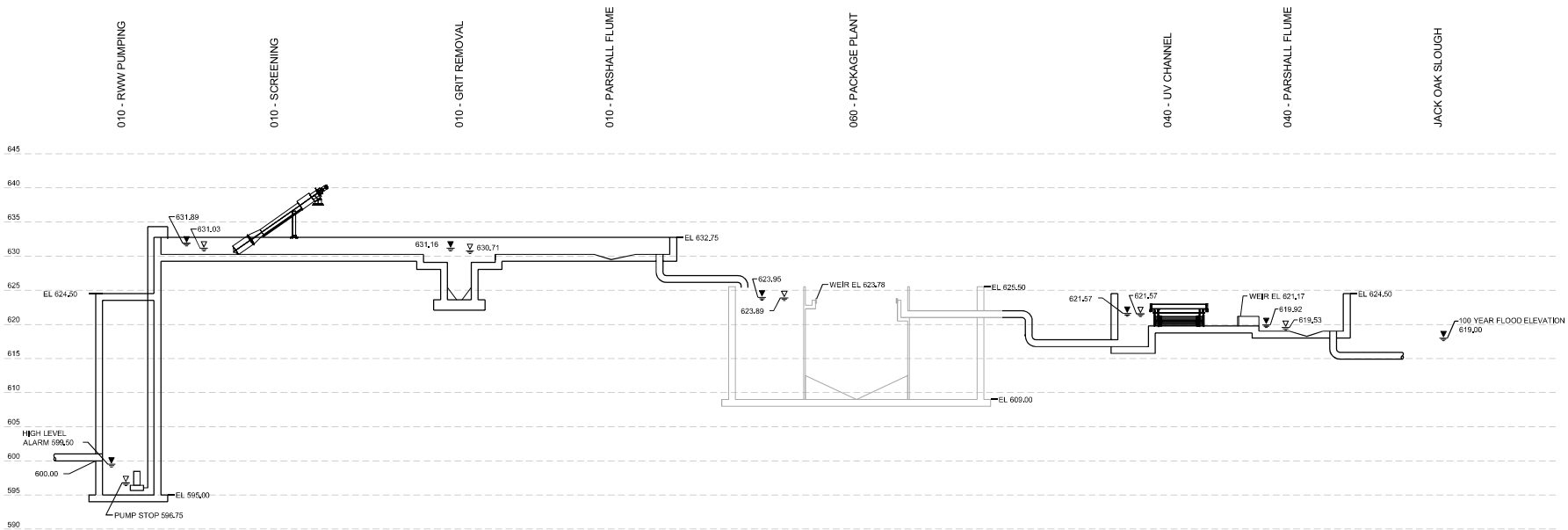
REVISIONS:

NO.	DATE	DESCRIPTION

SHEET TITLE:
Proposed Process Piping Plan

FOR CONSTRUCTION

PROJECT NUMBER	D12-085
SHEET SCALE	1" = 10'
DRAWN BY	C.Coyler
DATE ISSUED	February 10, 2015
SHEET DISCIPLINE	005D102
SHEET NUMBER	25 of 103



HYDRAULIC PROFILE
VERTICAL SCALE: 1/8"=1'-0"
HORIZONTAL: NTS
004M101

GENERAL NOTES

1. WATER ELEVATIONS ARE BASED ON THE FOLLOWING:
   - DESIGN AVERAGE DAILY FLOW: 0.40 MGD
   - DESIGN PEAK HOURLY FLOW: 1.20 MGD
2. WATER ELEVATIONS SHOWN ARE BASED ON ALL TREATMENT UNITS IN SERVICE.

Consultant:
DELTA 3 ENGINEERING INC
PROFESSIONAL CIVIL, MUNICIPAL & STRUCTURAL ENGINEERING - ARCHITECTURE
GRANT WRITING - LAND DEVELOPMENT - PLANNING & CADD SERVICES
306 SOUTH CHESTNUT STREET
PLATTEVILLE, WISCONSIN 53818
PHONE: (608) 348-6399
FAX: (608) 348-6405

Sub-Consultant:
DONOHUE
3311 WEEDEN CREEK ROAD
SHEBOYGAN, WI 53081
PHONE (920) 208-0296

PROPOSED WASTE WATER TREATMENT FACILITY UPGRADE
VILLAGE OF CASSVILLE
1022 JACK OAK RD. CASSVILLE, WISCONSIN, 53806

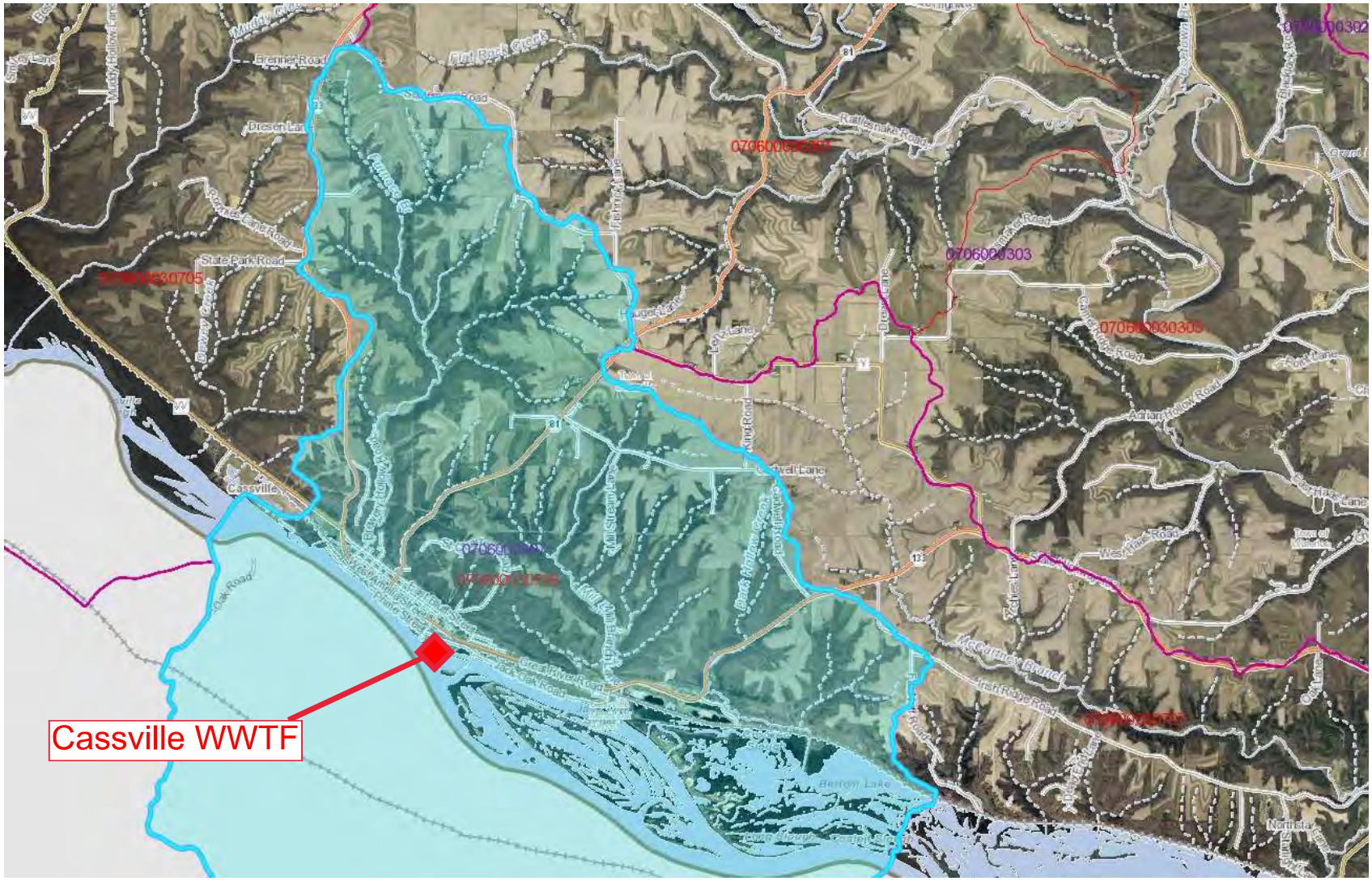
REVISIONS:		
NO.	DATE	DESCRIPTION

SHEET TITLE:
HYDRAULIC PROFILE

FOR CONSTRUCTION	
PROJECT NUMBER	D12-085
SHEET SCALE	1" = 8'
DRAWN BY	A. BERGSTROM
DATE, ISSUED	February 10, 2015
SHEET DISCIPLINE	004M101
SHEET NUMBER	7 of 103

Attachment #6

Cassville Watershed Map



Legend

- 12-digit HUCs (Subwatersheds)
- 10-digit HUCs (Watersheds)
- 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

Trade Agreement for Point to Nonpoint Source Trades

Permittee Information

Credit User Name (Permittee)	Permit Number
Village of Cassville	WI-0021423

Credit User Address

1022 Jack Oak Road, Cassville, WI 53806

Permittee/Broker/Exchange Name (if applicable)	Trade Agreement Number
	1

Permittee/Broker/Exchange Address (if applicable)

Street Address	Village	State	ZIP Code

Project Name

Proposed 2025 Stream Improvements – Mill Branch

Name of Credit Generator (Landowner/Operator) (Last, First, M.I.)

Street Address	Village	State	ZIP Code

Property Information

Name of Landowner(s) (if not Operator) (Last, First, M.I.)

Street Address	Village	State	ZIP Code

Legal Description of Property - Contiguous sites under the same ownership: (add additional sheets if necessary)

Earl & Heidi Hochhausen - Tracts: Parcels #008-00630-0000 and #008-00654-0020

Parcel ID(s):

Site Locator for Construction Projects

County	Township	Range E / W	Section	Quarter/Quarter (e.g., NW ¼ of the NE ¼)
Grant	3N	5W	27	SW 1/4 – NW 1/4
Grant	3N	5W	28	SE 1/4 – NE 1/4
Grant	3N	5W	28	NE 1/4 – SE 1/4

Agreement

The property described above is enrolled in a Water Quality Trade Agreement. This agreement commits the landowner/operator, their heirs, successors and assigns to fulfill the trade agreement until a satisfaction or release is filed by the grantee.

Appendices which describe the BMPs, costs, installation schedule, and conditions are hereby incorporated into this agreement and are on file with the grantee and may be given to Wisconsin DNR upon request by the Department.

Section A – General Requirements

1) Trade Agreement 1 (TA1) includes the following:
    a. Appendix 1: Village of Cassville Water Quality Trading Plan
    b. Appendix 2: Proposed 2025 Stream Improvements – Mill Branch Plans and Specifications
    c. Appendix 3: Stream Improvements Construction Easements
2) This agreement may be amended by mutual agreement of either party, so long as the agreement has not yet expired.
3) Appendices which describe the BMPs, costs, installation schedule, and conditions are hereby incorporated into this agreement and are on file with the grantee and may be given to Wisconsin Department of Natural Resources (DNR) upon request by the DNR.
4) If the Landowner/Operator wishes to sell or lease all or portions of the properties described in the Appendices, TA1 will be binding to the new Landowner/Operator.
5) Standard inspections, maintenance, and repairs shall be performed by the Village of Cassville or Authorized Representative of the Village of Cassville. Standard inspections shall be performed on a monthly basis and following any event with potential to cause damage to the Project. Maintenance and repairs will be performed as needed according to inspection findings and recommendations.
6) This agreement will commence on the date of execution. The agreement will remain in place until **December 31, 2030.** If the Water Quality Trading Credits are no longer applicable for meeting Wisconsin Pollutant Discharge Elimination System (WPDES) Permit for the Wastewater Treatment Facility at the Village of Cassville, TA1 will become null and void.

Section B – Landowner/Operator Shall:

1) Grant all Trading Credits generated by the Project to the Village of Cassville.
2) Allow the Grantee, or Authorized Representative of the Grantee, access to the site for installation, operation, and maintenance.
    a. The DNR will be considered an Authorized Representative of the Grantee and will be allowed access to the Project site as required for Best Management Practice (BMP) installation inspection and Trading Credit validation.
    b. The Grantee or Authorized Representative shall be granted access to the described Permanent and Temporary Stream Improvements' Construction Easements as necessary for completing inspection, maintenance, and repairs.
3) Not be held liable for damages to life, limb, or property due to the installation, operation, and maintenance of the Project.
4) Not damage, disturb, prohibit, or otherwise interfere with the installation, operation, and maintenance of the Project.
5) Be allowed to perform maintenance to vegetation growing in and along the BMP at the expense of the Landowner/Operator.

Section C – Grantee Shall:

1) Obtain permits required for the installation, operation, and maintenance of the Project.
2) Meet all DNR requirements associated with the Project at the expense of the Village.
3) Design, install, operate, and maintain BMPs defined in Appendix 1 and Appendix 2 of this agreement at expense of the Village.
4) Not remove any rocks, trees, soils, or other properties, unless so agreed.
5) Repair access roads, fields, fences, landscaping, and any other areas disturbed by the installation, operation, and maintenance activities for the Project.
6) Coordinate construction activities with Landowner/Operator.
7) Perform maintenance to the BMPs as necessary to maintain Water Quality Trading Credits.

TA Number	Typed Name of Landowner/Operator	Initials of Landowner/Operator	Date
1			

ACKNOWLEDGMENT

STATE OF WISCONSIN}$_{SS}$ GRANT COUNTY }

Personally came before me this_____day of _____, 20___, the above named _____and_____to me known to be the persons who executed the foregoing instrument and acknowledge the same.

_____
*
Notary Public
Grant County, Wisconsin
My Commission expires : _____

Attachment #8

Wetland Map - Cassville, WI - Mill Branch

Legend

- Wetland Indicators
- Lake Class Areas
- Riverine/ditch Class Areas
- Wetland Class Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
  - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Lake Class Areas
- Riverine/ditch Class Areas
- Wetland Class Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
  - Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- NRCS Wetspots
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway

Notes

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

Attachment #9

COC:_____

STATEWIDE AGRICULTURAL PERFORMANCE STANDARDS COMPLIANCE SURVEY

Landowner: Earl Hochhausen **Date:** September 19, 2025

Tract Number:_____ **Conservation Staff:** _____

Circle the watershed where the survey was done.

GP01 – Galena River
GP02 – Platte River
GP03 – Little Platte River
GP04 – Lower Grant River
GP05 – Middle Grant
GP06 – Upper Grant
GP07 – Mississippi River
LW01 – Millville Creek
LW07 – Green River & Crooked Creek
LW09 – Blue River

Cert. of Comp. _____ acres
Last NMP Year: 20___
_____ Acres by: _____

1.) Are livestock raised on land enrolled in the Farmland Preservation Program (FPP)?	Y	**N**	(If No, go to Question #2)
1a.) Are livestock concentrated in a WQMA?	Y	N	(If No, go to Question #1d)
1b.) Is clean water diverted away from concentrated areas?	Y	N	
1c.) Is direct runoff from concentrated areas prevented from reaching waters of the state?	Y	N	
1d.) Does the farm have milkhouse waste?	Y	**N**	(If No, go to Question 1f)
1e.) Is milkhouse waste prevented from reaching WOS?	Y	N	
1f.) Does the farm have feed storage?	**Y**	N	(If No, go to Question 1h)
1g.) Is feed leachate prevented from reaching WOS?	**Y**	N	
1h.) Do livestock have access to waters of the state?	**Y**	N	(If No, go to Question #1j)
1i.) Is there adequate sod along waters of the state?	**Y**	N	
1j.) Is manure stacked on the property?	Y	**N**	(If No, go to Question #2)
1k.) Is manure stacked in a WQMA?	Y	N	
1l.) Is clean water diverted away from manure stacks	Y	N	
1m.) Is direct runoff from manure stacks prevented from reaching waters of the state?	Y	N	
2.) Has manure storage ever been built on the property?	Y	**N**	# Yr (If No, go to Question #3)
2a.) If storage has been built since 5/19/1999, was it built according to NRCS standards?	Y	N	
2b.) Are any facilities leaking or failing	Y	N	
2c.) Are any facilities overflowing?	Y	N	
2d.) Have any of the facilities been closed	Y	N	# Yr
2e.) If they were closed after 5/19/1999, were they closed according to NRCS standards	Y	N	

COC:_____

STATEWIDE AGRICULTURAL PERFORMANCE STANDARDS COMPLIANCE SURVEY

3.) Are any or all acres of tillable land enrolled in CRP? Y **N** _____ Acres
(If No, go to Question #4)

4.) Are agricultural crops produced on land enrolled in FPP? Y **N**

4a.) Do all acres of tillable land meet tolerable soil loss? Y N _____ Acres

4b.) Does the landowner maintain a 5' tillage setback from waters of the state? Y N N/A

5.) Does producer have a NMP for spot check year? Y **N** Renter_____

5a.) If Yes, Date_____ Acres_____ from NMP Checklist

5b.) If No, is producer willing to develop or update a NMP? Y N _____ Agronomist, Class
Agronomist Name: _____ Circle one

6.) Is chemical fertilizer applied to the pasture? Y **N** _____ Pasture #

_____ Acres

horses
7.) Do ~~cattle~~ graze on the property? **Y** N

Pasture # 1

2 AU * 365 days * 35 % / **244** = 1 AU/Ac
2.5 Acres of Pasture **Exempt** **Y or N**

Pasture # _____

_____ AU * _____ days * _____ % / **244** = _____ AU/Ac
_____ Acres of Pasture **Exempt** **Y or N**

Pasture # _____

_____ AU * _____ days * _____ % / **244** = _____ AU/Ac
_____ Acres of Pasture **Exempt** **Y or N**

Pasture # _____

_____ AU * _____ days * _____ % / **244** = _____ AU/Ac
_____ Acres of Pasture **Exempt** **Y or N**

0 Acres of pasture needing a nutrient management plan

Pasture Map

9/19/2025, 1:13:43 PM

1:1,730

0 80 160 320 ft

0 20 40 80 m

PLSS and Control

Approximate

Tax Parcels

Grant County Roads

LOCAL

PF Sections

PF Section Quarter Quarters

Attachment #10

Current State of Eroding Streambanks Documentation					
ID	Eroding Bank Height Measurement #	Eroding Bank Height (Feet)	Eroding Bank Length (Feet)	Erosion Rate (Feet/Year)	Soil Type
A	1	7.7	30.0	0.30	Silt Loam
	2	6.8			
	3	-			
	4	-			
	5	-			
	AVERAGE	7.2			
A.1a	1	4.0	35.0	0.40	Silt Loam
	2				
	3				
	AVERAGE	4.0			
A.1b	1	3.5	25.0	0.35	Silt Loam
	2				
	3				
	AVERAGE	3.5			
A.1c	1	3.0	27.0	0.20	Silt Loam
	2				
	3				
	AVERAGE	3.0			
A.1d	1	4.0	16.0	0.30	Silt Loam
	2				
	3				
	AVERAGE	4.0			
A.1e	1	6.0	18.0	0.30	Silt Loam
	2				
	3				
	AVERAGE	6.0			
A.1f	1	4.0	13.0	0.35	Silt Loam
	2				
	3				
	AVERAGE	4.0			
A.1g	1	8.0	23.0	0.50	Silt Loam
	2				
	3				
	AVERAGE	8.0			
A.1h	1	8.0	15.0	0.50	Silt Loam
	2				
	3				
	AVERAGE	8.0			
A.1i	1	4.0	15.0	0.50	Silt Loam
	2				
	3				
	AVERAGE	4.0			

Current State of Eroding Streambanks Documentation					
ID	Eroding Bank Height Measurement #	Eroding Bank Height (Feet)	Eroding Bank Length (Feet)	Erosion Rate (Feet/Year)	Soil Type
A.3	1	8.5	99.5	0.25	Silt Loam
	2	7.7			
	3	8.5			
	4	8.3			
	5	-			
	AVERAGE	8.2			
C	1	9.4	94.6	0.40	Silt Loam
	2	8.5			
	3	9.5			
	4	-			
	5	-			
	AVERAGE	9.1			
F	1	9.0	61.9	0.25	Silt Loam
	2	7.5			
	3	4.5			
	4	-			
	5	-			
	AVERAGE	7.0			
G	1	7.5	48.0	0.35	Silt Loam
	2	4.0			
	3	-			
	4	-			
	5	-			
	AVERAGE	5.8			
H	1	4.3	24.5	0.40	Silt Loam
	2	3.0			
	3	-			
	4	-			
	5	-			
	AVERAGE	3.7			
I	1	7.0	29.0	0.30	Silt Loam
	2	8.5			
	3	-			
	4	-			
	5	-			
	AVERAGE	7.8			
J	1	7.0	27.6	0.35	Silt Loam
	2	-			
	3	-			
	4	-			
	5	-			
	AVERAGE	7.0			

Current State of Eroding Streambanks Documentation					
ID	Eroding Bank Height Measurement #	Eroding Bank Height (Feet)	Eroding Bank Length (Feet)	Erosion Rate (Feet/Year)	Soil Type
K	1	6.3	124.5	0.30	Silt Loam
	2	4.0			
	3	4.0			
	4	-			
	5	-			
	AVERAGE	4.8			
L	1	7.0	85.4	0.35	Silt Loam
	2	7.2			
	3	-			
	4	-			
	5	-			
	AVERAGE	7.1			
M.1	1	5.0	16.0	0.35	Silt Loam
	2				
	3				
	4				
	5				
	6				
	AVERAGE	5.0			
M.2	1	4.0	49.0	0.35	Silt Loam
	2				
	3				
	4				
	5				
	6				
	AVERAGE	4.0			
M.3	1	6.0	16.0	0.30	Silt Loam
	2				
	3				
	4				
	5				
	6				
	AVERAGE	6.0			
M.4	1	6.0	58.0	0.30	Silt Loam
	2				
	3				
	4				
	5				
	6				
	AVERAGE	6.0			

Current State of Eroding Streambanks Documentation					
ID	Eroding Bank Height Measurement #	Eroding Bank Height (Feet)	Eroding Bank Length (Feet)	Erosion Rate (Feet/Year)	Soil Type
N	1	4.2	30.0	0.15	Silt Loam
	2	5.0			
	3				
	4	-			
	5	-			
	AVERAGE	4.6			
O	1	7.5	158.8	0.25	Silt Loam
	2	5.9			
	3	6.9			
	4	-			
	5	-			
	AVERAGE	6.8			
P	1	5.5	23.6	0.30	Silt Loam
	2	-			
	3	-			
	4	-			
	5	-			
	AVERAGE	5.5			
Q	1	6.9	44.6	0.25	Silt Loam
	2	7.3			
	3	-			
	4	-			
	5	-			
	AVERAGE	7.1			
R	1	4.7	111.7	0.25	Silt Loam
	2	5.5			
	3	2.8			
	4	-			
	5	-			
	AVERAGE	4.3			

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #1

ID: Q - STA 101+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #2

ID: Q - STA 101+50

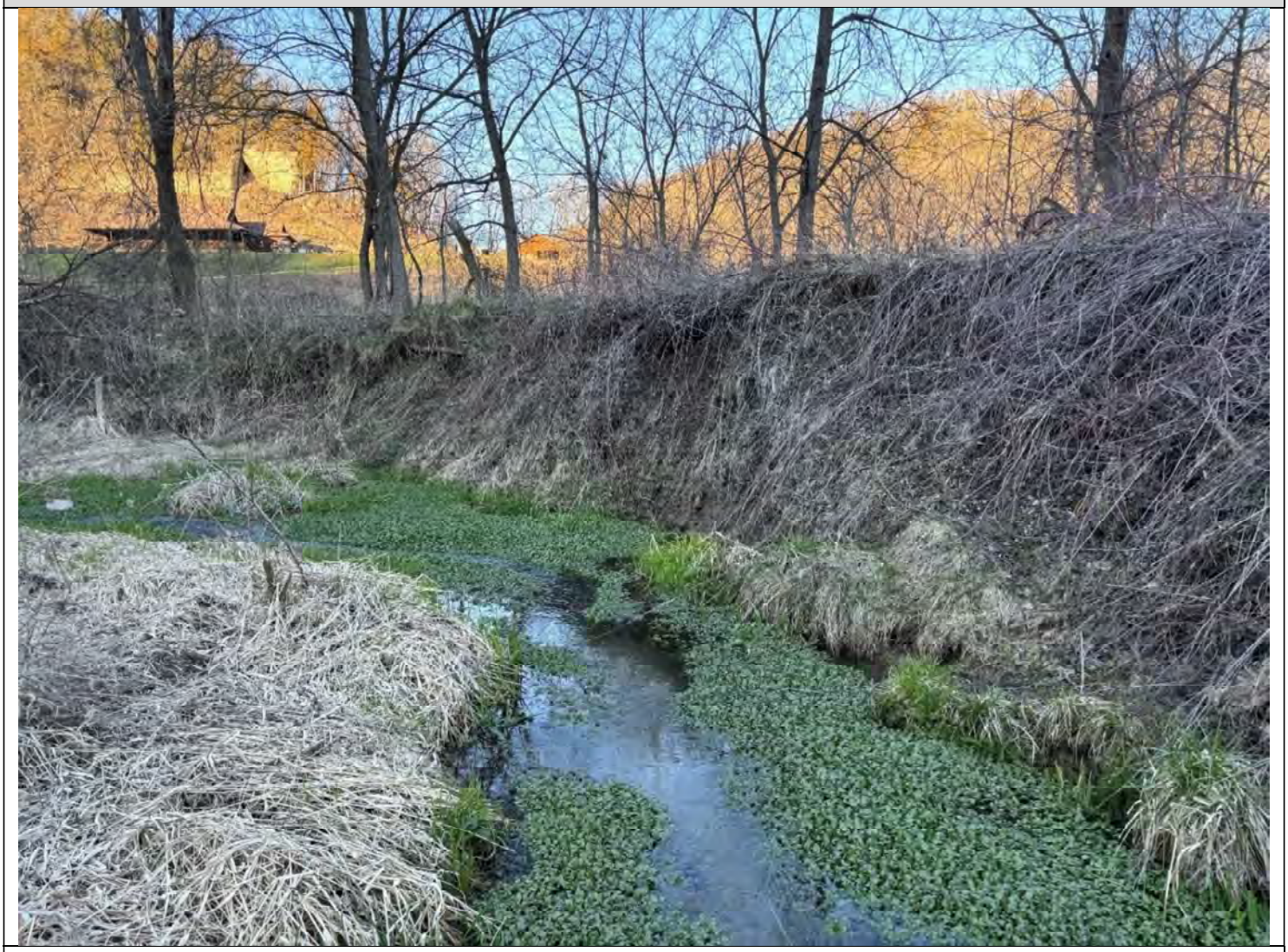
Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #3



ID: Q - STA 102+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #4

ID: P - STA 102+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #5

ID: O - STA 103+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☐Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Photo #6

ID: O - STA 103+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #7

ID: O - STA 104+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #8

ID: N/O - STA 104+25

Viewing Direction: Downstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #9

ID: N - STA 105+25

Viewing Direction: Downstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☐Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #10

ID: M.4 - STA 105+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #11

ID: M.4 - STA 106+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #12

ID: M.3 - STA 106+50

Viewing Direction: Downstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #13

ID: M.2 - STA 107+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☐Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #14

ID: M.1 – STA 107+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #15

ID: L - STA 108+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #16

ID: L

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #17

ID: L

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #18

ID: K - STA 108+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #19

ID: K - STA 109+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☐Exposed Tree Roots
☒Fallen Trees
☒Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #20

ID: R – STA 109+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☐Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Photo #21

ID: R

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #22

ID: R

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☒Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #23

ID: J - STA 109+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☒Other: Erosion encroaching on fence line.

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #24

ID: I - STA 110+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☐Vertical or Near Vertical Banks
☐Exposed Tree Roots
☒Fallen Trees
☒Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #25

ID: H - STA 110+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #26

ID: G - STA 111+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☒Gullies or Rills
☐Other:

Photo #27

ID: F - STA 111+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #28

ID: F - STA 112+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Photo #29

ID: C - STA 114+40

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #30

ID: C - STA 114+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #31

ID: C - STA 115+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Photo #32

ID: A.1i - STA 116+50

Viewing Direction: Upstream

Evidence of Erosion:

☐Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Photo #33

ID: A.1h - STA 117+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #34

ID: A.1g - STA 117+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #35

ID: A.1f - STA 117+50

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☒Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #36

ID: A.1e - STA 117+60

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #37

ID: A.1d - STA 118+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #38

ID: A.1c - STA 118+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #39

ID: A.1b - STA 119+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #40

ID: A.1a - STA 120+00

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #41

ID: A - STA 120+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☒Other: Erosion encroaching on existing driveway

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #42

ID: A - STA 121+25

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☐Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☒Other: Erosion encroaching on existing driveway

Photo #43

ID: A.3 - STA 121+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Photo #44

ID: A.3 - STA 122+75

Viewing Direction: Upstream

Evidence of Erosion:

☐Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☐Vertical or Near Vertical Banks
☒Exposed Tree Roots
☒Fallen Trees
☐Gullies or Rills
☐Other:

Project Photos
Water Quality Trading Plan – Mill Branch
Village of Cassville

Photo #45

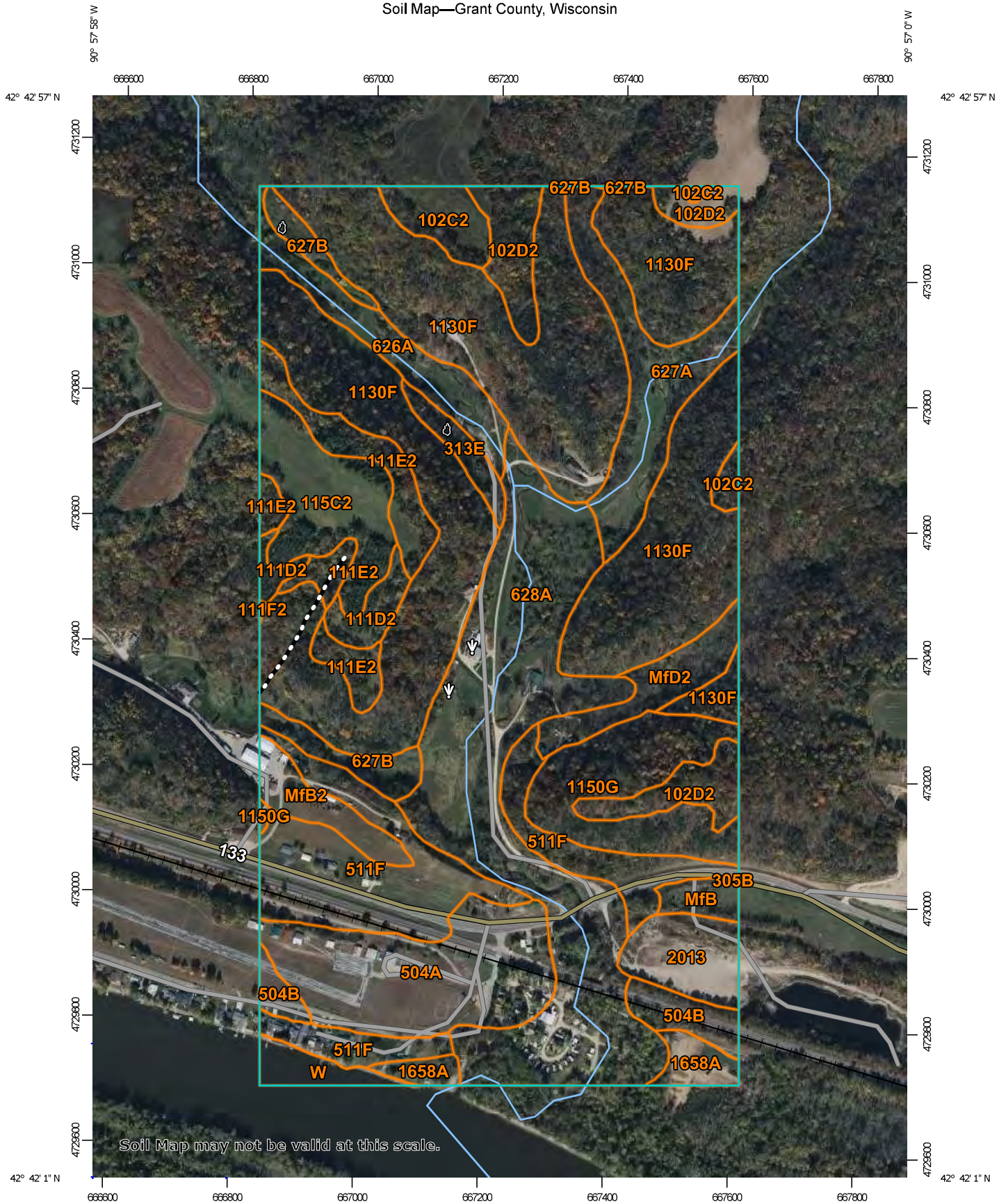
ID: A.3 - STA 123+75

Viewing Direction: Upstream

Evidence of Erosion:

☒Severe Undercut with Slump
☒Vegetative Overhang
☒Bare Soil Visible
☒Vertical or Near Vertical Banks
☒Exposed Tree Roots
☐Fallen Trees
☐Gullies or Rills
☐Other:

Attachment #11



Map Scale: 1:8,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 400 800 1600 2400

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.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Grant County, Wisconsin
Survey Area Data: Version 19, Sep 3, 2024

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

Date(s) aerial images were photographed: Oct 15, 2020—Aug 4, 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
102C2	Fayette silt loam, 6 to 12 percent slopes, moderately eroded	4.7	1.7%
102D2	Fayette silt loam, 12 to 20 percent slopes, moderately eroded	9.7	3.6%
111D2	Seaton silt loam, river bluff, 10 to 18 percent slopes, moderately eroded	3.2	1.2%
111E2	Seaton silt loam, river bluff, 15 to 25 percent slopes, moderately eroded	9.1	3.3%
111F2	Seaton silt loam, river bluff, 18 to 35 percent slopes, moderately eroded	0.1	0.0%
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded	10.2	3.8%
305B	Richwood silt loam, 1 to 6 percent slopes	0.1	0.0%
313E	Plumcreek silt loam, 20 to 45 percent slopes	2.2	0.8%
504A	Sparta loamy fine sand, 0 to 3 percent slopes	18.4	6.7%
504B	Sparta loamy fine sand, 2 to 6 percent slopes	4.1	1.5%
511F	Plainfield sand, river valley, 15 to 60 percent slopes	24.5	9.0%
626A	Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded	7.2	2.6%
627A	Chaseburg silt loam, moderately well drained, 0 to 2 percent slopes	11.7	4.3%
627B	Chaseburg silt loam, moderately well drained, 2 to 6 percent slopes	4.7	1.7%
628A	Orion silt loam, 0 to 3 percent slopes, occasionally flooded	42.7	15.6%
1130F	Lacrescent-Dunbarton complex, very stony, 30 to 60 percent slopes	85.8	31.4%
1150G	Brodale, deep-Lacrescent, very stony-Rock outcrop complex, 60 to 90 percent slopes	12.5	4.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1658A	Algansee-Kalmarville complex, river valleys, 0 to 3 percent slopes, frequently flooded	3.4	1.2%
2013	Pits, gravel	5.5	2.0%
MfB	Meridian fine sandy loam, 2 to 6 percent slopes	1.8	0.7%
MfB2	Meridian fine sandy loam, 2 to 6 percent slopes, moderately eroded	3.9	1.4%
MfD2	Meridian fine sandy loam, 10 to 15 percent slopes, moderately eroded	5.2	1.9%
W	Water	2.4	0.9%
Totals for Area of Interest		**273.0**	**100.0%**

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

Total Phosphorus Analysis 10/24/2023

Delta 3 Engineering

Field ID	Sample ID	Total P (ppm)	
~~1~~	~~1T~~	~~536~~	
~~1~~	~~2T~~	~~565.6~~	
1	3T	557.1	Stream ID: O
1	4T	712.4	Stream ID: M.1, M.2, M.3, M.4
1	5T	771	Stream ID: M.1, M.2, M.3, M.4
~~1~~	~~6~~	~~719~~	
~~1~~	~~7~~	~~694.6~~	
~~1~~	~~8~~	~~579.5~~	
~~1~~	~~9~~	~~1117~~	
~~1~~	~~10~~	~~772.3~~	
~~1~~	~~11~~	~~988~~	
1	12	521.2	Stream ID: A.1
1	13	698	Stream ID: A.1
~~1~~	~~14~~	~~529.9~~	Stream ID: A.2
1	15	728.9	Stream ID: A.3

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

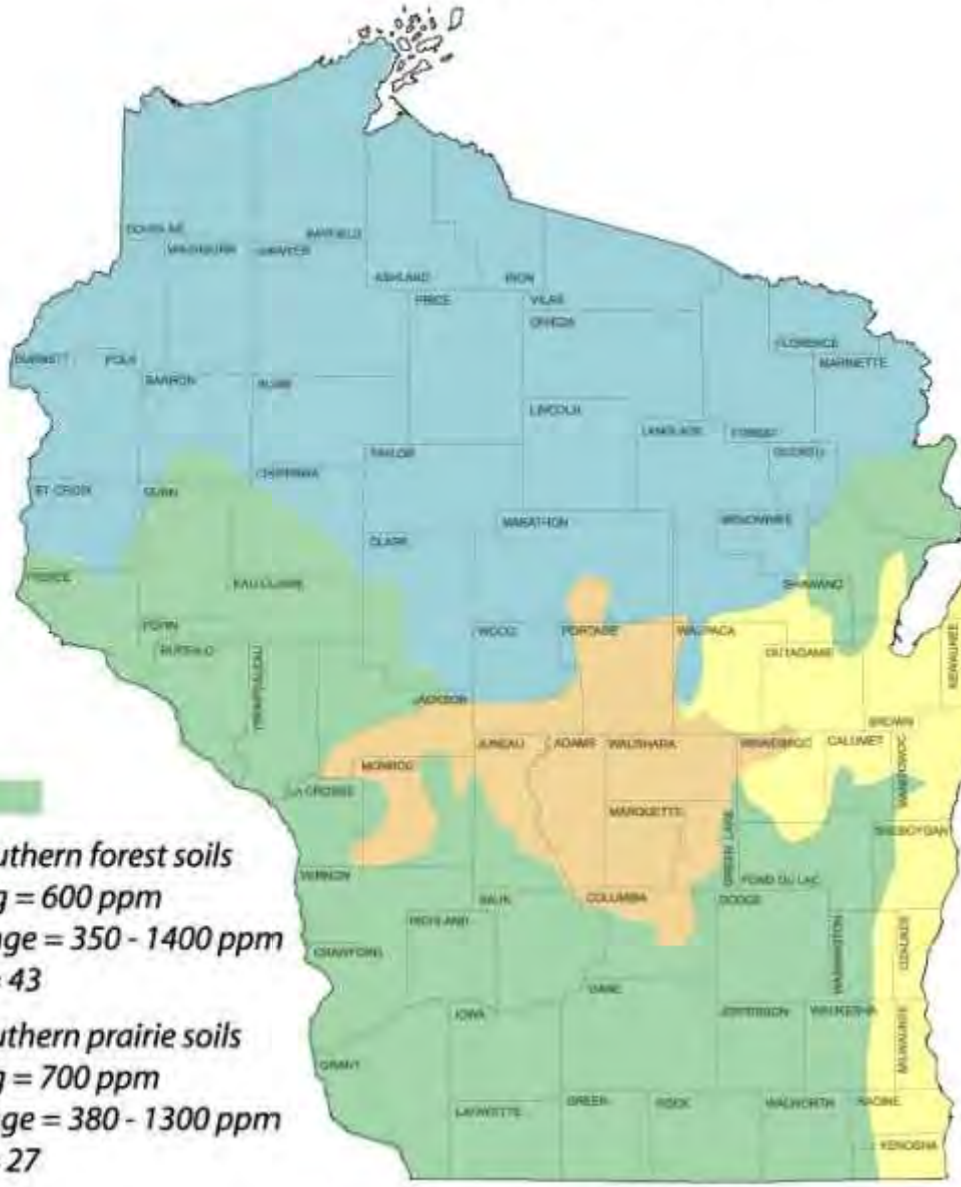
710 Commerce Drive
PO Box 169
Watertown, WI 53094

Total Phosphorus Analysis 06/10/2024

Delta 3 Engineering

Field ID	Sample ID	Total P (ppm)
Cassville	A	574.6
Cassville	B	518.1
Cassville	C	360.2
Cassville	D	456
Cassville	E	437.4
Cassville	F	295.8
Cassville	G	374.1
Cassville	H	536.9
Cassville	I	545.6
Cassville	J	495.8
Cassville	K	392.6
Cassville	L	424.2
Cassville	M	476.0
Cassville	N	464.1
Cassville	O	398.8
Cassville	P	491.8
Cassville	Q	375.2
Cassville	R	463.9

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 #12

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:

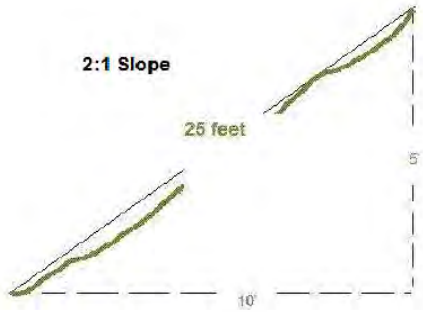
$$\frac{\text{Gully } \textbf{Length} \text{ X (Average } \textbf{Width} \text{ X Average } \textbf{Depth} \text{ X 0.5) X } \textbf{Soil Weight} \text{ (lbs/ft3)}}{2000} \;/\; \text{Formation Years} = \textbf{Estimated} \text{ Soil Loss Per Year (Tons)}$$

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: Village of Cassville
Tract Number: Varies
Evaluated By: L. Hoppman
Evaluation Date: September 26, 2025

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)	Average Soil Total Phosphorus (ppm)	Estimated Phosphorus Loss (Pounds/Year)	MDV Trade Ratio	MDV Phosphorus Offset	Final Trade Ratio	WQT Credits
Mill Branch	R	111.7	4.3	484	0.25	121	Silt Loam	85	5	463.9	4.8	1:1	4.8	2.84:1	2
	Q	44.6	7.1	317	0.25	79	Silt Loam	85	3	375.2	2.5	1:1	2.5	2.84:1	1
	P	23.6	5.5	130	0.30	39	Silt Loam	85	2	491.8	1.6	1:1	1.6	2.84:1	1
	O	158.8	6.8	1,075	0.25	269	Silt Loam	85	11	478.0	10.9	1:1	10.9	2.84:1	4
	N	30.0	4.6	138	0.15	21	Silt Loam	85	1	464.1	0.8	1:1	0.8	2.84:1	0.5
	M.1	16.0	5.0	80	0.35	28	Silt Loam	85	1	653.1	1.6	1:1	1.6	2.84:1	1
	M.2	49.0	4.0	196	0.35	69	Silt Loam	85	3	653.1	3.8	1:1	3.8	2.84:1	1
	M.3	16.0	6.0	96	0.30	29	Silt Loam	85	1	653.1	1.6	1:1	1.6	2.84:1	1
	M.4	58.0	6.0	348	0.30	104	Silt Loam	85	4	653.1	5.8	1:1	5.8	2.84:1	2
	L	85.4	7.1	609	0.35	213	Silt Loam	85	9	424.2	7.7	1:1	7.7	2.84:1	3
	K	124.5	4.8	594	0.30	178	Silt Loam	85	8	392.6	5.9	1:1	5.9	2.84:1	2
	J	27.6	7.0	193	0.35	68	Silt Loam	85	3	495.8	2.8	1:1	2.8	2.84:1	1
	I	29.0	7.8	225	0.30	67	Silt Loam	85	3	545.6	3.1	1:1	3.1	2.84:1	1
	H	24.5	3.7	89	0.40	36	Silt Loam	85	2	536.9	1.6	1:1	1.6	2.84:1	1
	G	48.0	5.8	276	0.35	97	Silt Loam	85	4	374.1	3.1	1:1	3.1	2.84:1	1
	F	61.9	7.0	433	0.25	108	Silt Loam	85	5	295.8	2.7	1:1	2.7	2.84:1	1
	C	94.6	9.1	864	0.40	345	Silt Loam	85	15	360.2	10.6	1:1	10.6	2.84:1	4
	A.1a	35.0	4.0	140	0.40	56	Silt Loam	85	2	609.6	2.9	1:1	2.9	2.84:1	1
	A.1b	25.0	3.5	88	0.35	31	Silt Loam	85	1	609.6	1.6	1:1	1.6	2.84:1	1
	A.1c	27.0	3.0	81	0.20	16	Silt Loam	85	1	609.6	0.8	1:1	0.8	2.84:1	0.5
	A.1d	16.0	4.0	64	0.30	19	Silt Loam	85	1	609.6	1.0	1:1	1.0	2.84:1	0.5
	A.1e	18.0	6.0	108	0.30	32	Silt Loam	85	1	609.6	1.7	1:1	1.7	2.84:1	1
	A.1f	13.0	4.0	52	0.35	18	Silt Loam	85	1	609.6	0.9	1:1	0.9	2.84:1	0.5
	A.1g	23.0	8.0	184	0.50	92	Silt Loam	85	4	609.6	4.8	1:1	4.8	2.84:1	2
	A.1h	15.0	8.0	120	0.50	60	Silt Loam	85	3	609.6	3.1	1:1	3.1	2.84:1	1
	A.1i	15.0	4.0	60	0.50	30	Silt Loam	85	1	609.6	1.6	1:1	1.6	2.84:1	1
	A.3	99.5	8.2	816	0.25	204	Silt Loam	85	9	728.9	12.6	1:1	12.6	2.84:1	4
	A	30.0	7.2	217	0.30	65	Silt Loam	85	3	574.6	3.2	1:1	3.2	2.84:1	1
TOTAL		**1,323**				**2,494**			**107**		**105.1**		**105.1**		**41**

Streambank or Ditch Erosion Calculation Formula:

$$\frac{\text{Eroding Bank/Ditch Length} \times \text{Eroding Bank Ht or Ditch Bottom Width} \times \text{Lateral or Ditch Bottom Recession Rate (FT/YR)} \times \text{Soil Weight (lbs/ft}^3\text{)}}{2000} = \text{Estimated Soil Loss Per Year (Tons)}$$

$$\text{Soil Total Phosphorus (ppm)} \times 10^{-6} \times \text{Estimated Soil Loss (Tons/Year)} \times 2000 \text{ Pounds/Ton} = \text{Estimated Phosphorus Loss Per Year (Pounds)}$$

Attachment #13

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

Privately Owned BMP:
Village representative to complete inspection form annually and following major storm events. The form will then be provided to the Maintenance Supervisor following inspection. The Village 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 the Village or Private Property Owner depending on agreement with the Village. The Private Property Owner will be allowed to perform maintenance activities at the expense of the Private Property Owner. Inspections and O&M activities shall be reported in the annual WQT Report sent to the DNR.

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

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

Practice Registration:
The purpose of the “Water Quality Trading Management Practice Registration” form is to report to DNR that a management practice identified in the trading plan has been properly installed and is established and effective. This information will be used to track implementation progress, verify compliance and perform audits, as necessary. A registration form should be submitted for every management practice that

has been identified in the trading plan. If practices are established prior to trading plan submittal, registration forms may be submitted with the trading plan. Otherwise, registration forms should be submitted during the permit term as practices become effective or with the annual report. A blank *Water Quality Trading Management Practice Registration Form 3400-207* is attached and should be submitted following implementation of the trading practice.

Tracking Procedures:
The 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.

Inspections/Maintenance Considerations:

- A *BMP Inspection Form* is attached.
    - ID: As noted on Construction Plans
    - Condition of BMP: Excellent; Good; Fair; or Poor
    - Required Maintenance: Provide a description of maintenance required for the BMP.
    - 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 Village will perform the work or if the Village 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.
    - Photos Taken: The inspector shall take photographic evidence to represent and archive the condition of each BMP.
- Following installation, inspect the disturbed areas closely over the next few months to ensure that seeding grows.
    - The riparian trees shall be monitored with the monthly BMP inspections. In the event of a tree which has been planted as part of this WQT Plan falls over, dies, or has been removed for any reason will need to be replaced immediately.
- 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.
- Monitoring the measures provided in the Grazing Plan are being followed for applicable BMP sites.
- 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 Village:

- Evaluate BMP condition
    - Reconstruct/replace BMPs that have settled, shifted, or washed out.

- Manage Vegetation
    - Remove invasive/noxious plants.
    - Reseed areas as necessary.
- Manage Garbage
    - Remove garbage and other debris that could otherwise impair the streambank stability.

Monthly Certification:
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."

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 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 notification should include:

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

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

DELTA 3
Platteville, Wisconsin
Dubuque, Iowa
P 608.348.5355
P 563.542.9005
E mail@delta3eng.biz
W www.delta3eng.biz

Streambank BMP Inspection Form

Date & Time:	
Inspector/Title:	
Weather:	
Reason for Inspection:	Monthly ☐ Precipitation Event ☐ Annual P.E. ☐ Other ☐:
Last Inspection Photos Date*:	

* inspection photos should be taken annually at minimum

ID	Vegetative Condition	Structural Condition	Bed Log and/or Tree Condition	Required Maintenance	Maintenance Estimate (Time and/or Cost)	Date Maintenance Completed	Comments

Photos Taken? ☐ Yes ☐ No

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

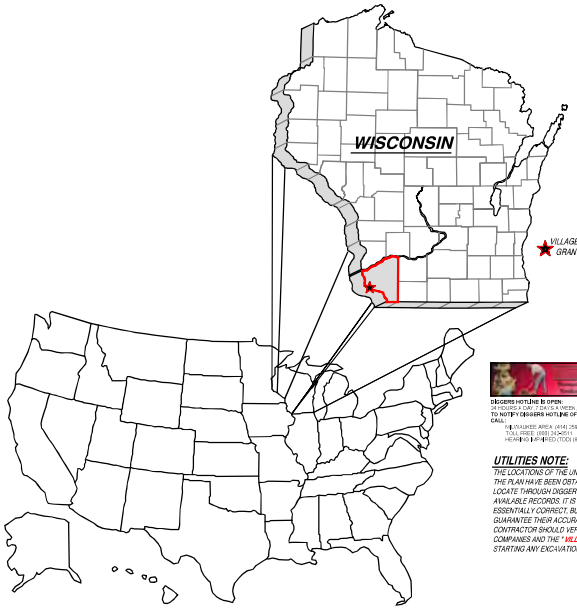
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. 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 #14

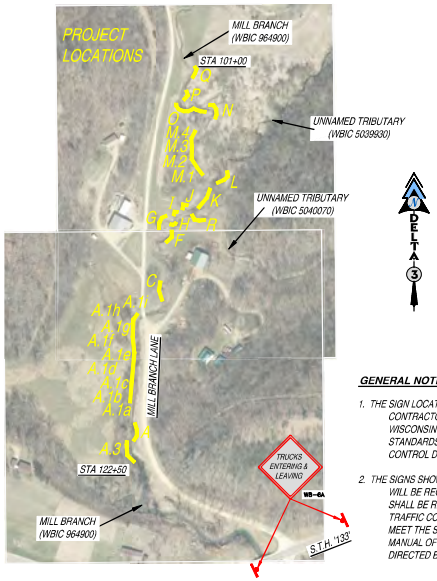
PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

OWNER: VILLAGE OF CASSVILLE



DIGGERS HOTLINE IS OPEN:
24 HOURS A DAY, 7 DAYS A WEEK, 365 DAYS A YEAR!
TO NOTIFY DIGGERS HOTLINE OF YOUINTENT TO DIG CALL:
MILWAUKEE AREA: (414) 259-1181
TOLL FREE: (800) 242-8511
HEARING IMPAIRED (TDD) (800) 542-2289

UTILITIES NOTE:
THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLAN HAVE BEEN OBTAINED BY FIELD CHECKS, A UTILITY LOCATE THROUGH DIGGERS HOTLINE, AND SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE SURVEYOR DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS. THE CONTRACTOR SHOULD VERIFY LOCATIONS W/ THE UTILITY COMPANIES AND THE " VILLAGE OF CASSVILLE " PRIOR TO STARTING ANY EXCAVATION.



PROJECT LOCATION MAP
SCALE: N.T.S.

GENERAL NOTES - TRAFFIC CONTROL

1. THE SIGN LOCATIONS SHOWN ARE APPROXIMATE LOCATIONS. CONTRACTOR SHALL INSTALL TRAFFIC CONTROL SIGNS PER WISCONSIN DEPARTMENT OF TRANSPORTATION (DOT) STANDARDS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. THE SIGNS SHOWN ARE THE MINIMUM TRAFFIC CONTROL THAT WILL BE REQUIRED FOR THE PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL TRAFFIC CONTROL MEASURES DURING CONSTRUCTION TO MEET THE STANDARDS OF THE WISCONSIN DOT AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND AS DIRECTED BY THE PROJECT ENGINEER.

SHEET INDEX:

SHEET TITLE:	SHEET DESCRIPTION:	DATE OF ISSUE:	DATE OF REVISION:
G000	TITLE SHEET & PROJECT LOCATION MAP	SEPTEMBER 19, 2025	-
G001	LEGEND & GENERAL NOTES	SEPTEMBER 19, 2025	-
C101 - C102	PLAN VIEW - MILL BRANCH	SEPTEMBER 19, 2025	-
C201	DETAILS - EROSION CONTROL & NOTES	SEPTEMBER 19, 2025	-
C202 - C203	DETAILS - STREAM BANK	SEPTEMBER 19, 2025	-

PROJECT INFORMATION:

OWNER:
VILLAGE OF CASSVILLE
MR. JARED KASTEN
VILLAGE PRESIDENT
100 W. AMELIA STREET
CASSVILLE, WI 53806
(608) 725-5180

SANITARY SEWER & WATER UTILITIES:
VILLAGE OF CASSVILLE
MR. JOSH MERGEN
DIRECTOR OF PUBLIC WORKS
100 W. AMELIA STREET
CASSVILLE, WI 53806
(608) 725-5180 (OFFICE)
(608) 732-0973 (MOBILE)

STREET AND STORM SEWER:
VILLAGE OF CASSVILLE
MR. DION NEMITZ
STREET SUPERINTENDENT
100 W. AMELIA STREET
CASSVILLE, WI 53806
(608) 725-5180 (OFFICE)
(608) 778-6351 (MOBILE)

TELEPHONE UTILITY:
TDS TELECOM
MR. JESSE BLOCK
140 N. MONROE STREET
LANCASTER, WI 53813
(608) 723-3633 (OFFICE)
(608) 495-0620 (CELL)

CABLE TELEVISION UTILITY:
CHARTER COMMUNICATIONS
MR. STEVE HEGGE
2701 DANIELS STREET
MADISON, WI 53718
(608) 274-3822 x 6687

ELECTRIC UTILITY:
ALLIANT ENERGY
MR. ALLAN MUMM
2200 E. CAMPION BLVD.
PRAIRIE DU CHIEN, WI 53821
(608) 326-9481 (OFFICE)
(608) 732-7925 (CELL)

ENGINEER:
DELTA 3
(DBP ANZ) COMPANY
PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING
CIVIL WORKS • LAND DEVELOPMENT • PLANNING & CAD SERVICES
575 SOUTH CHESTNUT STREET PHONE: (608) 348-5355
PLATTEVILLE, WISCONSIN 53818
900 JACKSON STREET PHONE: (563) 542-4085
DUBUQUE, IOWA 52001

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:
MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK
CASSVILLE, WI
PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE; 100 W. AMELIA STREET; CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:
-/-/-		-

PRELIMINARY

PROJECT NUMBER	D25-187
SHEET SCALE	NOT TO SCALE
DRAWN BY	C.COYIER
DATE ISSUED	SEPTEMBER 19, 2025
SHEET DESC.	TITLE SHEET & PROJECT LOCATION MAP

SHEET TITLE:
G000

LEGEND

- EX. CON. MANHOLE
- EX. ECC. MANHOLE
- EX. LIFT STATION
- EX. CLEAN OUT
- EX. FIRE HYDRANT
- EX. WATER SERVICE
- EX. WATER VALVE
- EX. YARD HYDRANT
- EX. CATCH BASIN
- EX. STORM INLET
- EX. NATURAL GAS VALVE
- EX. NATURAL GAS METER
- EX. POWER POLE
- EX. LIGHT POLE
- EX. WARNING SIREN
- EX. TEL. PEDESTAL
- EX. MAILBOX
- EX. LP TANK
- EX. SATELLITE DISH
- EX. POST OR POLE
- EX. STREET SIGN
- EX. EVERGREEN TREE
- EX. DECIDUOUS TREE
- EX. TREE STUMP
- EX. BUSH/SHRUB
- EX. TREE/BRUSH LINE
- EX. WINDMILL
- EX. PARK BENCH
- EX. BENCHMARK
- SURVEY CONTROL POINT
- EX. PROPERTY PIN
- R/W — RIGHT-OF-WAY
- P/L — PROPERTY LINE
- EASEMENT
- San. Lat. — EX. SAN. S. LATERAL
- 6" San. S. — EX. 6" SAN. S. MAIN
- 8" San. S. — EX. 8" SAN. S. MAIN
- 10" San. S. — EX. 10" SAN. S. MAIN
- 12" San. S. — EX. 12" SAN. S. MAIN
- 15" San. S. — EX. 15" SAN. S. MAIN
- EX. FLOW DIRECTION
- E — EX. CAPPED SERVICE
- EX. WATER SERVICE
- 4" Water — EX. 4" WATER MAIN
- 6" Water — EX. 6" WATER MAIN
- 8" Water — EX. 8" WATER MAIN
- 10" Water — EX. 10" WATER MAIN
- 12" Water — EX. 12" WATER MAIN
- EX. <12" STORM SEWER
- 12" St. Sewer — EX. 12" STORM SEWER
- 15" St. Sewer — EX. 15" STORM SEWER
- 18" St. Sewer — EX. 18" STORM SEWER
- 24" St. Sewer — EX. 24" STORM SEWER
- 27" St. Sewer — EX. 27" STORM SEWER
- 30" St. Sewer — EX. 30" STORM SEWER
- 36" St. Sewer — EX. 36" STORM SEWER
- 42" St. Sewer — EX. 42" STORM SEWER
- 48" St. Sewer — EX. 48" STORM SEWER
- EX. CURB AND GUTTER
- GAS — EX. U.GRD N. GAS UTILITY
- UGE — EX. U.GRD ELECTRIC UTILITY
- UGC — EX. U.GRD CABLE TV UTILITY
- TEL — EX. U.GRD TELEPHONE UTILITY
- FO — EX. U.GRD FIBER OPTIC UTILITY
- OHE — EX. OVERHEAD ELECTRIC
- EX. FENCE
- EX. RAILROAD TRACKS
- 99 — EX. CONTOUR
- EX. DRAINAGE SWALE

- PROP. SANITARY SEWER LATERAL
- PROP. <6" SANITARY SEWER MAIN
- PROP. 6" SANITARY SEWER MAIN
- PROP. 8" SANITARY SEWER MAIN
- PROP. 10" SANITARY SEWER MAIN
- PROP. 12" SANITARY SEWER MAIN
- PROP. 15" SANITARY SEWER MAIN
- PROP. 18" SANITARY SEWER MAIN
- PROP. CIPP LINER
- PROP. FLOW DIRECTION
- PROP. WATER SERVICE
- PROP. <4" WATER MAIN
- PROP. 4" WATER MAIN
- PROP. 6" WATER MAIN
- PROP. 8" WATER MAIN
- PROP. 10" WATER MAIN
- PROP. 12" WATER MAIN
- PROP. 15" WATER MAIN
- PROP. <12" STORM SEWER
- PROP. 12" STORM SEWER
- PROP. 15" STORM SEWER
- PROP. 18" STORM SEWER
- PROP. 24" STORM SEWER
- PROP. 30" STORM SEWER
- PROP. 36" STORM SEWER
- PROP. 48" STORM SEWER
- PROP. CURB AND GUTTER
- PROP. CURB BACK OPENING
- GAS — PROP. U.GRD GAS UTILITY
- UGE — PROP. U.GRD ELECTRIC UTILITY
- UGCTV — PROP. U.GRD CABLE TV UTILITY
- UGT — PROP. U.GRD TELEPHONE UTILITY
- FIBER — PROP. U.GRD FIBER OPTIC UTILITY
- OHE — PROP. OVERHEAD ELECTRIC
- CAUTION NATURAL GAS — PROP. CROSSING OF N. GAS UTILITY
- PROP. UTILITY POLE
- PROP. LIGHT POLE
- PROP. FENCE
- PROP. TEMPORARY EASEMENT / CONSTRUCTION EASEMENT
- ESTIMATED DISTURBANCE LIMITS
- 99 — PROP. CONTOUR
- PROP. DRAINAGE SWALE
- PROP. SILT FENCE
- PROP. EROSION CONTROL SEDIMENT LOG
- PROP. PAVEMENT MARKING
- PAINTED TRAFFIC ARROW
- ADA PARKING DESIGNATION
- 10 — PARKING STALL COUNT
- 5'R, 0+00 — RADIUS POINT/SIZE, STA. ON CENTERLINE
- PROP. HANDICAP RAMP WITH DETECTABLE WARNING FIELD
- SOIL BORING LOCATION
- RIVER FLOW DIRECTION
- PROP. 4' DIA. SANITARY MANHOLE
- PROP. 5' DIA. SANITARY MANHOLE
- PROP. MANHOLE CHIMNEY REHABILITATION / TOP ADJUSTMENT
- PROP. SANITARY LIFT STATION

- PROP. TYPE "X" CURB & GUTTER
- PROP. REVERSE-PITCH CURB & GUTTER
- PROP. HOT MIX ASPHALT PAVEMENT (DRIVEWAY)
- PROP. 4" CONCRETE SIDEWALK
- PROP. 6" CONCRETE PAVEMENT
- PROP. 8" CONCRETE PAVEMENT
- PROP. GRAVEL SHOULDER / DRIVEWAY
- EROSION MATTING (MILD SLOPES)
- EROSION MATTING (STEEP SLOPES)
- PROP. STREAM BANK GRADING (6:1 SLOPES)
- PROP. STREAM BANK GRADING W/RIP-RAP (2:1 SLOPES)
- PROP. BACKWATER REFUGE
- PROP. STORM STRUCTURES - PROFILE
- PROP. STORM PIPE(RCP) - PROFILE
- PROP. STORM PIPE(CMP OR HDPE) - PROFILE
- PROP. SANITARY STRUCTURE - PROFILE
- PROP. WATER MAIN PIPE - PROFILE
- PROP. CLAY LINER - PROFILE
- PROP. SANITARY SEWER FORCE MAIN - PROFILE
- PROP. SPOT REPAIR - PROFILE / PLAN VIEW
- PROP. CASING PIPE - PROFILE
- PROP. CLEARING AND GRUBBING
- PROP. BUILDING REMOVAL
- PROP. SIDEWALK REMOVAL

- PROP. PRESSURE-REDUCING VALVE STATION
- PROP. FIRE HYDRANT
- PROP. WATER SERVICE
- PROP. WATER SERVICE WITH VALVE BOX SLEEVE
- PROP. WATER VALVE
- PROP. WATER BEND - HORIZONTAL
- PROP. WATER BEND - VERTICAL
- PROP. WATER BEND <5°
- PROP. WATER TEE
- PROP. WATER CROSS
- PROP. WATER REDUCER
- PROP. MJ PLUG
- PROP. 4' DIA. STORM MANHOLE
- PROP. 5' DIA. STORM MANHOLE
- PROP. INLET
- PROP. 4' DIA. INLET
- PROP. 6' DIA. INLET
- PROP. 4' DIA. CATCH BASIN- W/ 2'X3' CASTING
- PROP. 5' DIA. CATCH BASIN- W/ 2'X3' CASTING
- PROP. 6' DIA. CATCH BASIN- W/ 2'X3' CASTING
- PROP. 4'X6' CATCH BASIN W/2'X3' CASTING
- PROP. CURB OPENING CASTING
- PROP. 2'X3' CATCH BASIN
- PROP. ADJUSTED CATCH BASIN TOP
- PROP. WISDOT TYPE 8 INLET
- PROP. WISDOT TYPE 9 INLET
- PROP. CMP ENDWALL
- PROP. RCP ENDWALL

KEY NOTES [100]:

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

NOTES:

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

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

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

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

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

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

TREE TRIMMING NOTE:
CONTRACTOR TO PROPERLY TRIM ALL TREE BRANCHES, ROOTS, AND BUSHES DISTURBED DUE TO CONSTRUCTION .

TREE REMOVAL NOTE:
CONTRACTOR TO CONTACT ENGINEER OR **OWNER** FOR VERIFICATION PRIOR TO ANY TREE REMOVAL.

SAW CUT NOTE:
CONTRACTOR TO PROVIDE FULL DEPTH SAW CUTS AND REPLACE PAVEMENT.

UTILITIES' NOTE:
THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLAN HAVE BEEN OBTAINED BY FIELD CHECKS, A UTILITY LOCATE THROUGH DIGGER'S HOTLINE , AND SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE SURVEYOR DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS. THE CONTRACTOR SHOULD VERIFY LOCATIONS W/ THE UTILITY COMPANIES AND **OWNER** PRIOR TO STARTING ANY EXCAVATION.

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

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

DISCIPLINE DESIGNATORS

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

DRAWING SHEET DESIGNATION

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

SHEET NUMBER IDENTIFICATION

C102
- DRAWING NUMBER
- DRAWING SHEET DESIGNATION
- DISCIPLINE DESIGNATION (MAY HAVE MULTIPLE)

ENGINEER:

DELTA 3
EVERY ANGLE COVERED
PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING
GRANT WRITING • LAND DEVELOPMENT • PLANNING & CADD SERVICES

875 SOUTH CHESTNUT STREET, PLATTEVILLE, WISCONSIN 53818 — PHONE: (608) 348-5355
898 JACKSON STREET, DUBUQUE, IOWA 52001 — PHONE: (563) 542-9005

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:

MR. JORDAN FURE P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK
CASSVILLE, WI

PROJECT LOCATION: MILL CREEK • EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE: 100 W. AMELIA STREET, CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION

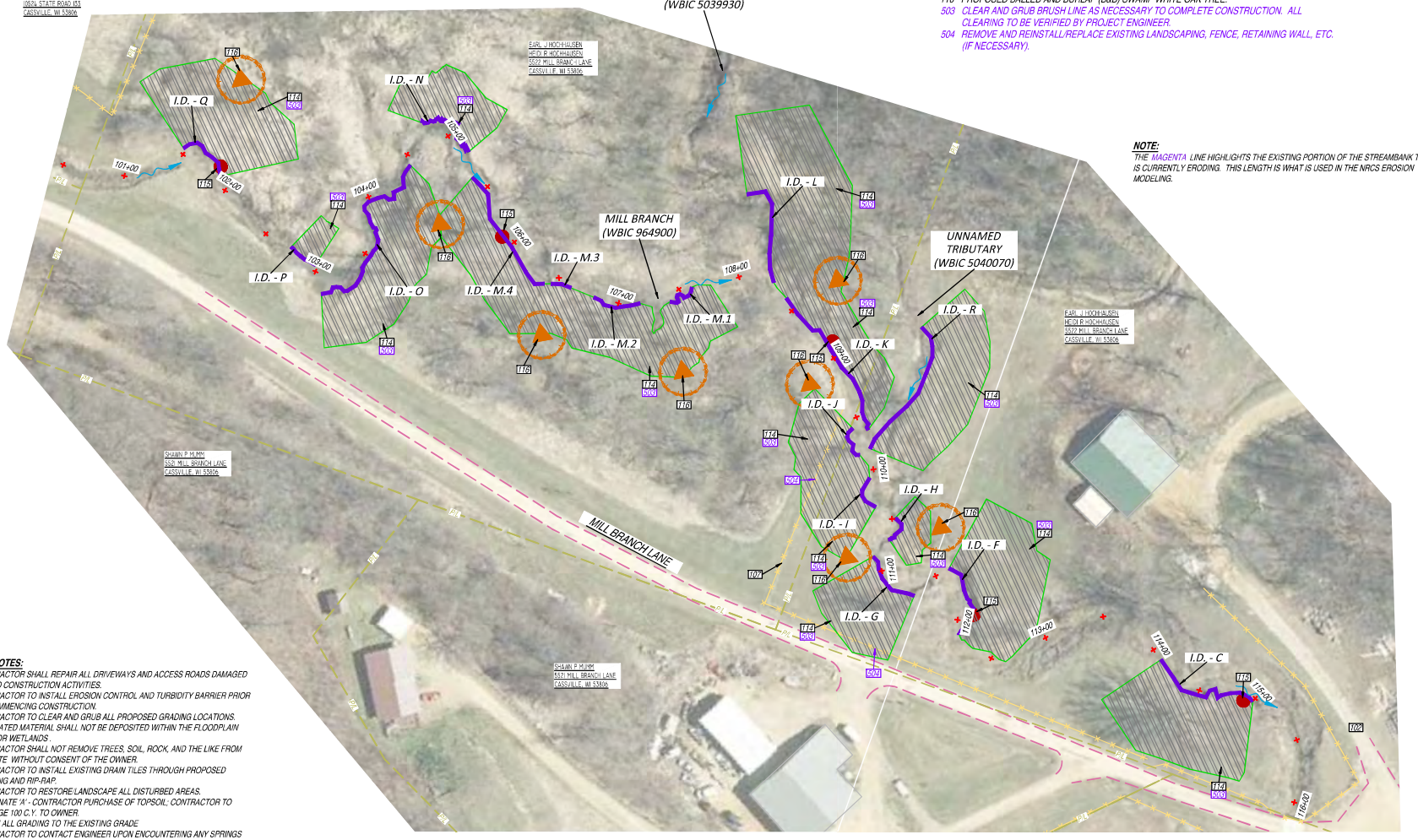
AS-BUILT: --/--/---- BY: -.-----

PRELIMINARY

PROJECT NUMBER	D20-187
SHEET SCALE	NOT TO SCALE
DRAWN BY	C.COYER
DATE ISSUED	SEPTEMBER 19, 2025
SHEET DESC.	LEGEND & GENERAL NOTES

SHEET TITLE: **G001**

SHEET NUMBER # 2 of 7



KEY NOTES [100] :

102 PROPOSED TRACKING PAD FOR EROSION CONTROL.
107 ITEM TO REMAIN.
109 PROPOSED TURBIDITY BARRIER (TYP.); SEE DETAIL - SHEET C201.
113 PROPOSED STREAM BANK GRADING (2:1 SLOPE) WITH RIP-RAP TO TOP OF BANK (SEE DETAIL - SHEET C202).
114 PROPOSED STREAM BANK GRADING (6:1 SLOPE)(SEE DETAIL - SHEET C202).
115 PROPOSED BED LOG IN STREAM HABITAT STRUCTURE.
116 PROPOSED BALLED AND BURLAP (B&B) SWAMP WHITE OAK TREE.
503 CLEAR AND GRUB BRUSH LINE AS NECESSARY TO COMPLETE CONSTRUCTION. ALL CLEARING TO BE VERIFIED BY PROJECT ENGINEER.
504 REMOVE AND REINSTALL/REPLACE EXISTING LANDSCAPING, FENCE, RETAINING WALL, ETC. (IF NECESSARY).

NOTE:
THE MAGENTA LINE HIGHLIGHTS THE EXISTING PORTION OF THE STREAMBANK THAT IS CURRENTLY ERODING. THIS LENGTH IS WHAT IS USED IN THE NRCS EROSION MODELING.

SCALE: 1"=80' (11"x17")
0 20 40 60

GENERAL NOTES:

1. CONTRACTOR SHALL REPAIR ALL DRIVEWAYS AND ACCESS ROADS DAMAGED DUE TO CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO INSTALL EROSION CONTROL AND TURBIDITY BARRIER PRIOR TO COMMENCING CONSTRUCTION.
3. CONTRACTOR TO CLEAR AND GRUB ALL PROPOSED GRADING LOCATIONS.
4. EXCAVATED MATERIAL SHALL NOT BE DEPOSITED WITHIN THE FLOODPLAIN AREA OR WETLANDS.
5. CONTRACTOR SHALL NOT REMOVE TREES, SOIL, ROCK, AND THE LIKE FROM THE SITE WITHOUT CONSENT OF THE OWNER.
6. CONTRACTOR TO INSTALL EXISTING DRAIN TILES THROUGH PROPOSED GRADING AND RIP-RAP.
7. CONTRACTOR TO RESTORE/LANDSCAPE ALL DISTURBED AREAS.
8. ALTERNATE 'A' - CONTRACTOR PURCHASE OF TOPSOIL; CONTRACTOR TO SALVAGE 100 C.Y. TO OWNER.
9. MATCH ALL GRADING TO THE EXISTING GRADE.
10. CONTRACTOR TO CONTACT ENGINEER UPON ENCOUNTERING ANY SPRINGS OR INSTREAM SEEPAGE.

ENGINEER:
DELTA 3
DEBY ANGEL CHORES
PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING
GRAND RAPIDS • LAND DEVELOPMENT • PLANNING & CAD SERVICES
375 SOUTH CHESTNUT STREET PHONE: (608) 348-5355
PLATTEVILLE, WISCONSIN 53818
999 JACKSON STREET PHONE: (563) 582-9005
DUBUQUE, IOWA 52001

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:
MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

CASSVILLE, WI

PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE; 100 W. AMELIA STREET; CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:

PRELIMINARY

PROJECT NUMBER	D20-187
SHEET SCALE	SEE BAR SCALE
DRAWN BY	L.HOPPMAN
DATE ISSUED	SEPTEMBER 18, 2025
SHEET DESC.	PLAN VIEW - MILL BRANCH

SHEET TITLE:
G001

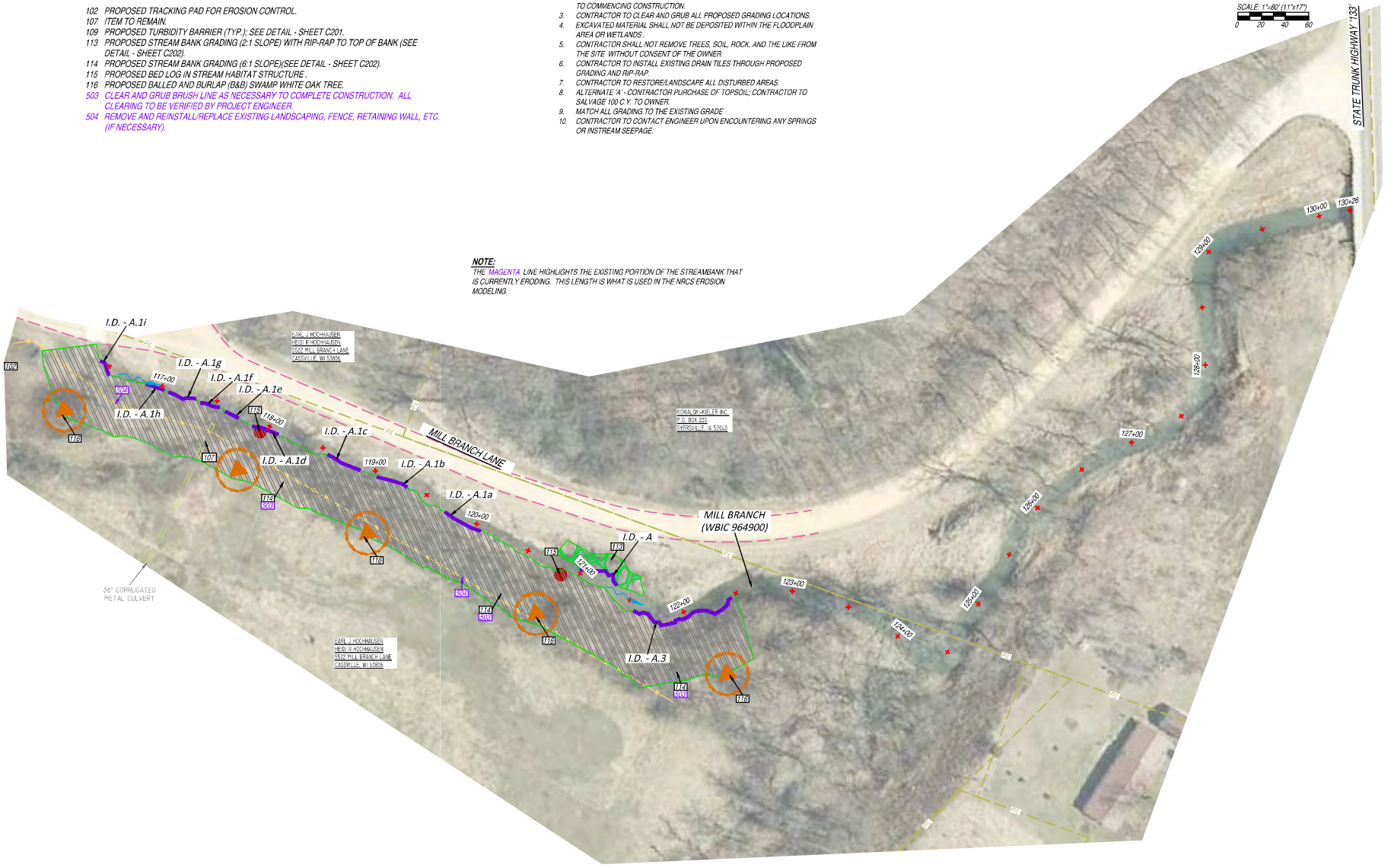
KEY NOTES 100 :

102 PROPOSED TRACKING PAD FOR EROSION CONTROL.
107 ITEM TO REMAIN.
109 PROPOSED TURBIDITY BARRIER (TYP.): SEE DETAIL - SHEET C201.
113 PROPOSED STREAM BANK GRADING (2:1 SLOPE) WITH RIP-RAP TO TOP OF BANK (SEE DETAIL - SHEET C202).
114 PROPOSED STREAM BANK GRADING (6:1 SLOPE)(SEE DETAIL - SHEET C202).
115 PROPOSED BED LOG IN STREAM HABITAT STRUCTURE.
116 PROPOSED BALLED AND BURLAP (B&B) SWAMP WHITE OAK TREE.
503 CLEAR AND GRUB BRUSH LINE AS NECESSARY TO COMPLETE CONSTRUCTION. ALL CLEARING TO BE VERIFIED BY PROJECT ENGINEER.
504 REMOVE AND REINSTALL/REPLACE EXISTING LANDSCAPING, FENCE, RETAINING WALL, ETC. (IF NECESSARY).

GENERAL NOTES:

1. CONTRACTOR SHALL REPAIR ALL DRIVEWAYS AND ACCESS ROADS DAMAGED DUE TO CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO INSTALL EROSION CONTROL AND TURBIDITY BARRIER PRIOR TO COMMENCING CONSTRUCTION.
3. CONTRACTOR TO CLEAR AND GRUB ALL PROPOSED GRADING LOCATIONS.
4. EXCAVATED MATERIAL SHALL NOT BE DEPOSITED WITHIN THE FLOODPLAIN AREA OR WETLANDS.
5. CONTRACTOR SHALL NOT REMOVE TREES, SOIL, ROCK, AND THE LIKE FROM THE SITE WITHOUT CONSENT OF THE OWNER.
6. CONTRACTOR TO INSTALL EXISTING DRAIN TILES THROUGH PROPOSED GRADING AND RIP-RAP.
7. CONTRACTOR TO RESTORE/LANDSCAPE ALL DISTURBED AREAS.
8. ALTERNATE 'A' - CONTRACTOR PURCHASE OF TOPSOIL; CONTRACTOR TO SALVAGE 100 C.Y. TO OWNER.
9. MATCH ALL GRADING TO THE EXISTING GRADE
10. CONTRACTOR TO CONTACT ENGINEER UPON ENCOUNTERING ANY SPRINGS OR INSTREAM SEEPAGE.

NOTE:
THE MAGENTA LINE HIGHLIGHTS THE EXISTING PORTION OF THE STREAMBANK THAT IS CURRENTLY ERODING. THIS LENGTH IS WHAT IS USED IN THE NRCS EROSION MODELING.



ENGINEER:
DELTA 3
ENGINEERING, INC.
PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING
LAND SURVEYING • LAND DEVELOPMENT PLANNING & CADD SERVICES
375 SOUTH CHESTNUT STREET
PLATTEVILLE, WISCONSIN 53818
PHONE: (608) 348-5355
599 JACKSON STREET
DUBUQUE, IOWA 52001
PHONE: (563) 582-9005

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:
MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

CASSVILLE, WI

PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE; 100 W. AMELIA STREET; CASSVILLE, WISCONSIN 53806

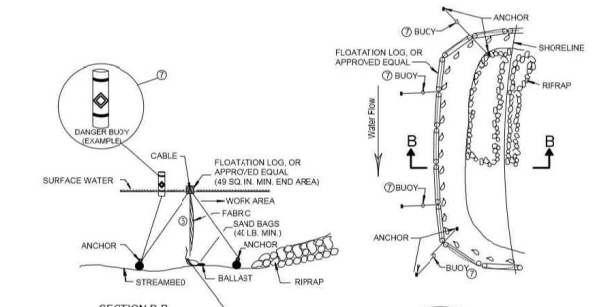
REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:

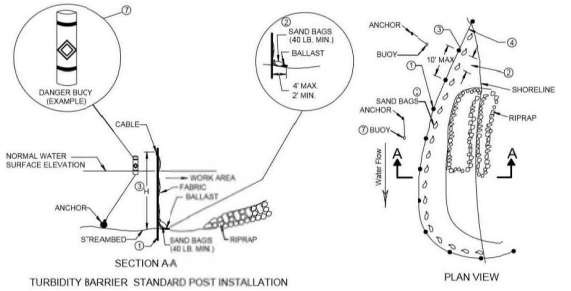
PRELIMINARY

PROJECT NUMBER	D20-187
SHEET SCALE	SEE BAR SCALE
DRAWN BY	L.HOPPMAN
DATE ISSUED	SEPTEMBER 19, 2025
SHEET DESC.	PLAN VIEW - MILL BRANCH

SHEET TITLE:
G001

Figure 1. Turbidity Barrier Placement Details



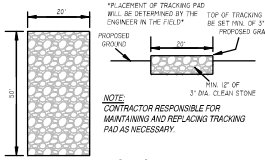


GENERAL NOTES

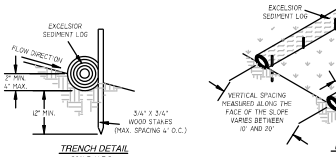
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD AND THE APPLICABLE SPECIAL PROVISIONS

TURBIDITY BARRIER MAY BE REMOVED AT THE ENGINEERS OR PROJECT MANAGERS DISCRETION, WHEN PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED.

1. DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.
2. SANDBAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER OR PROJECT MANAGER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.
3. WHEN BARRIER HEIGHT, H, EXCEEDS 8 FT., POST SPACING MAY NEED TO BE DECREASED.
4. IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.
5. FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER OR PROJECT MANAGER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.
6. ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.
7. USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



TRACKING PAD DETAIL
SCALE: N.T.S.

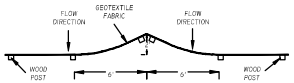


TRENCH DETAIL
SCALE: N.T.S.

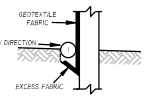
INSTALLATION DETAIL
SCALE: N.T.S.

TYPE 1 = 20' ROLL (HEAVY DUTY CONCENTRATED FLOW)
TYPE 2 = 12" ROLL (HEAVY CONCENTRATED FLOW)
TYPE 3 = 9" ROLL (MILD CONCENTRATED FLOW)
TYPE 4 = 6" ROLL (LOW CONCENTRATED FLOW)

EROSION CONTROL SEDIMENT LOG
SCALE: N.T.S.



SILT FENCE - JOINING TWO LENGTHS DETAIL
SCALE: N.T.S.

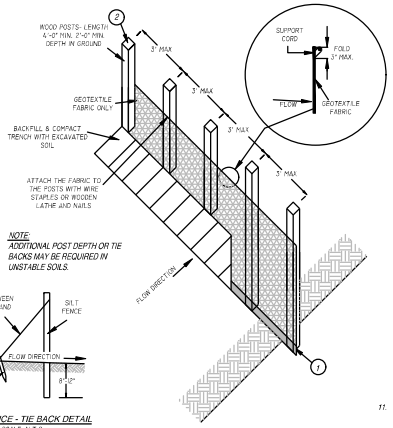


SILT FENCE - TRENCH DETAIL
SCALE: N.T.S.

GENERAL NOTES- SILT FENCE:

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION (MOST CURRENT EDITION) AND THE APPLICABLE SPECIAL PROVISIONS.

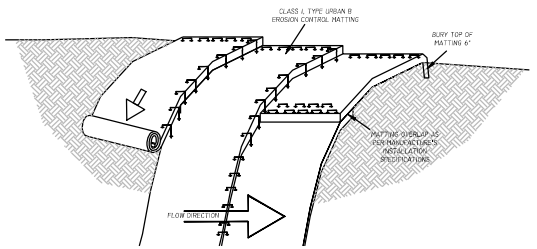
1. *TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL*
2. *WOOD POST SHALL BE A MINIMUM SIZE OF 1-1/8" X 1-1/8" OF OAK OR HICKORY.*



SILT FENCE - TIE BACK DETAIL
SCALE: N.T.S.

SILT FENCE INSTALLATION DETAIL
SCALE: N.T.S.

SILT FENCE DETAILS
SCALE: N.T.S.



EROSION MATTING NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND MULCH AND SEED.
2. BEGIN AT THE TOP OF THE SHOULDER (OR CHANNEL) BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS DOWN (STARTING AT DOWNSTREAM PROCEEDING UPSTREAM) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MANUFACTURE'S RECOMENDED OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH AN OVERLAP. USE A DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE BLANKETS.
6. IN HIGH CHANNEL APPLICATIONS, A STAPLE SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A ROW OF STAPLES 4" APART OVER THE ENTIRE WIDTH OF THE CHANNEL. PLACE A SECOND ROW 4" BELOW THE FIRST ROW IN A STAGERED PATTERN.
7. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

EROSION MATTING - SLOPE INSTALLATION DETAIL
SCALE: N.T.S.

EROSION CONTROL NOTES:

1. GENERAL EROSION NOTES AND MAINTENANCE MEASURES ARE ILLUSTRATED ON THE PLAN SHEETS. AFTER AWARD OF THE CONTRACT, THE GENERAL CONTRACTOR SHALL INSTALL ALL BEST MANAGEMENT PRACTICES AS SHOWN ON THE PLAN SHEETS. ONCE INSTALLED, THE GENERAL CONTRACTOR SHALL CONTACT DELTA 3 ENGINEERING, INC. (608-348-5355). ONCE NOTIFIED DELTA 3 ENGINEERING INC. WILL VISIT THE SITE WITHIN 5 DAYS TO REVIEW THE SITE WITH THE GENERAL CONTRACTORS SUPERINTENDENT. UPON VISITING THE SITE, THE CONSULTING ENGINEER AND THE GENERAL CONTRACTORS SUPERINTENDENT WILL REVIEW THE SITE FOR COMPLIANCE WITH THE EROSION CONTROL MEASURES. IF AND WHEN ALL BEST MANAGEMENT PRACTICES REQUIRED TO COMMENCE SITE CONSTRUCTION ARE IN PLACE, THE CONSULTING ENGINEER AND PROJECT SUPERINTENDENT WILL SIGN AND CERTIFY THIS FACT. THIS REVIEW AND CERTIFICATION SHALL TAKE PLACE PRIOR TO THE REQUIRED PRE-CONSTRUCTION MEETING. THE SITE SUPERINTENDENT SHALL MAINTAIN AN AS-BUILT COPY OF THE EROSION CONTROL MEASURES ON SITE AT ALL TIMES. ANY ACTIVITIES INVOLVING INSTALLATION OF BEST MANAGEMENT PRACTICES SHALL BE INDICATED ON THE AS-BUILT PLAN WITH AN INSTALLED TIME AND DATE. RECORDED INFORMATION SHALL BE PERMANENTLY PLACED ON THE SITE MAP INCLUDING ANY CHANGES MADE TO THE BEST MANAGEMENT PRACTICES. IF THE SITE MAP BECOMES HARD TO READ, THE INITIAL DRAWING SHALL BE SAVED AND A CLEAN COPY SHALL BE ISSUED IN ORDER TO CONTINUE RECORDING ANY ON-SITE EROSION CONTROL ACTIVITY.
2. A COMPLETE COPY OF ALL INSPECTION REPORTS, PLAN REVISIONS, ETC., MUST BE RETAINED AT THE PROJECT SITE AT ALL TIMES DURING DURATION OF THE PROJECT AND KEPT IN THE PERMANENT PROJECT RECORDS FOR AT LEAST FIVE YEARS FOLLOWING SUBMISSION OF THE NOTICE OF TERMINATION (NOT).
3. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THAT ALL SUB-CONTRACTORS INVOLVED IN GROUND DISTURBING ACTIVITY COMPLY WITH THE EROSION CONTROL REQUIREMENTS.
4. DAILY INSPECTIONS BY THE PROJECT SUPERINTENDENT AND MONTHLY INSPECTIONS BY THE OWNER'S CONSTRUCTION MANAGER MUST BE MADE TO DETERMINE THE EFFECTIVENESS OF THE EROSION CONTROL MEASURES. THE GENERAL CONTRACTOR IS TO INSPECT EROSION AND SEDIMENT CONTROLS WITHIN 24 HOURS AFTER A RAINFALL EVENT OF 0.5 INCHES OR GREATER. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR OR REPLACE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES AS NECESSARY WITHIN 24 HOURS OF INSPECTION.
5. ONCE THE SITE REACHES FINAL STABILIZATION, ALL PERMANENT EROSION AND SEDIMENTATION CONTROLS ARE INSTALLED AND ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS ARE REMOVED. THE GENERAL CONTRACTOR AND OWNER MUST COMPLETE A FINAL SITE INSPECTION. UPON APPROVAL BY OWNER, THE OWNER AND GENERAL CONTRACTOR, AS APPLICABLE, MUST COMPLETE AND SUBMIT A NOTICE OF TERMINATION (NOT) FORM TO BE SUBMITTED TO THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES.
6. A RECORD OF THE DATES WHEN MAJOR GROUND-DISTURBING ACTIVITIES OCCUR, WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, AND WHEN STABILIZATION MEASURES ARE INITIATED MUST BE MAINTAINED UNTIL THE NOT IS FILED. CONTROLS MUST BE IN PLACE DOWN GRADIENT OF GROUND-DISTURBING ACTIVITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
7. A LOG OF ALL INSPECTIONS BY FEDERAL, STATE, OR LOCAL STORM WATER OR OTHER ENVIRONMENTAL AGENCIES SHALL BE KEPT BY THE GENERAL CONTRACTOR. THE LOG SHALL INCLUDE THE DATE AND TIME OF VISIT AND WHETHER A REPORT WAS ISSUED OR WILL BE ISSUED AS A RESULT OF THE INSPECTION. ANY REPORTS ISSUED SHALL BE FAXED TO THE DELTA 3 ENGINEERING INC. 608-348-5455 (FAX).
8. SOIL STABILIZATION - THE PURPOSE OF SOIL STABILIZATION IS TO PREVENT SOIL FROM LEAVING THE SITE. IN THE NATURAL CONDITION, SOIL IS STABILIZED BY NATIVE VEGETATION. THE PRIMARY TECHNIQUE TO BE USED AT THIS PROJECT FOR STABILIZING SITE SOIL WILL BE TO PROVIDE A PROTECTIVE COVER OF TURF GRASS OR PAVEMENT.
   (A) TEMPORARY SEEDING OR STABILIZATION - AREAS MAY BE STABILIZED TEMPORARILY WITH THE USE OF FAST-GERMINATING ANNUAL SEED, STRAW MULCH, WOOD CELLULOSE FIBERS, TACKIFIERS, NETTING OR BLANKET. WHERE CONDITIONS ARE FAVORABLE, AREAS SHALL BE TEMPORARILY STABILIZED WITHIN 7 DAYS AFTER CONSTRUCTION ACTIVITY CEASES. ALL DISTURBED GROUND WHERE THERE WILL NOT BE CONSTRUCTION FOR LONGER THAN 14 DAYS MUST BE SEEDED OR OTHERWISE STABILIZED.
   (B) PERMANENT SEEDING OR SOD - ALL AREAS AT FINAL GRADE MUST BE SEEDED OR SODDED WITHIN 3 DAYS AFTER COMPLETION OF THE MAJOR CONSTRUCTION ACTIVITY. EXCEPT FOR SMALL LEVEL SPOTS, SEEDED AREAS SHOULD GENERALLY BE PROTECTED WITH MULCH. ALL AREAS TO BE SEEDED WILL ALSO HAVE TOPSOIL AND OTHER AMENDMENTS AS STATED IN WISDOT SPECIFICATION SECTION 02900-PLANTING.
   (C) MULCHING - ALL AREAS THAT ARE TEMPORARY OR PERMANENT SEEDED SHALL BE MULCHED ACCORDING TO SECTION 627 - MULCHING OF THE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. ALL MULCH IS TO BE ANCHORED UTILIZING METHOD A, B, OR C.
   (D) EROSION CONTROL MATTING - FOR ANY SLOPES GREATER THAN 3:1, EROSION MATTING IS REQUIRED.
9. STRUCTURAL CONTROLS - BEFORE ANY MAJOR GRADING ACTIVITIES, THE FOLLOWING BEST MANAGEMENT PRACTICES SHALL BE INSTALLED ON THE PROPOSED SITE - SILT FENCE, TEMPORARY TRACKING PAD, AND STORM SEWER INLET PROTECTION.
   (A) SILT FENCE - SILT FENCE IS A SYNTHETIC PERMEABLE WOVEN OR NON-WOVEN FABRIC TYPICALLY INCORPORATING WOODEN OR METAL SUPPORT STAKES AT INTERVALS SUFFICIENT TO SUPPORT THE FENCE, WATER, AND SEDIMENT RETAINED BY THE FENCE. SILT FENCE CAN ALSO BE INSTALLED WITH A WIRE FENCE BACKING. THE FENCE IS DESIGNED TO RETAIN SEDIMENT-LADEN WATER AND ALLOW SETTLEMENT OF SUSPENDED SOILS BEFORE THE STORM WATER FLOWS THROUGH THE FABRIC FOR DISCHARGE DOWNSTREAM. SILT FENCE SHALL BE LOCATED AS SHOWN ON THE PLAN SHEETS. THE SILT FENCE TO BE INCLUDED FOR THIS PROJECT SHALL BE CONSTRUCTED PER WISCONSIN DNR TECHNICAL STANDARDS FOR SILT FENCE (CODE 1056)
   (B) TEMPORARY TRACKING PAD - ALL ACCESS POINTS FROM THE PUBLIC STREET INTO THE CONSTRUCTION SITE SHALL INCLUDE A TRACKING PAD COMPOSED OF COURSE STONE TO THE DIMENSIONS SHOWN ON DETAIL SHEET (C201). ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD SHALL BE REMOVED BY STREET CLEANING (NOT FLUSHING) BEFORE THE END OF EACH WORKDAY.
   (C) STORM SEWER INLET PROTECTION - CURB AND GRATED INLETS ARE PROTECTED FROM THE INTRUSION OF SILT AND SEDIMENT THROUGH A VARIETY OF SEDIMENT CONTROL PRACTICES TO ALLOW SETTLEMENT OF SUSPENDED SOILS BEFORE DISCHARGING INTO THE STORM SEWER. GRATED INLETS TYPICALLY INCLUDE A STURDY FRAME WRAPPED IN GEOTEXTILE FABRIC OR SEDIMENT LOG PERIMETER TO SLOW THE FLOW OF WATER AND ALLOW PONDING WHERE SEDIMENT MAY SETTLE OUT. CURB INLETS TYPICALLY INCLUDE SEDIMENT LOG BARRIERS HELD IN PLACE WITH GEOTEXTILE FABRIC. OTHER MANUFACTURED PRODUCTS ARE ALSO AVAILABLE. ALL STORM DRAINS SHALL BE PROTECTED BY USING STRAW BALES, SEDIMENT LOGS, FABRIC, OR EQUIVALENT BARRIER.

   FINAL SITE STABILIZATION IS ACHIEVED WHEN TURF GRASS COVER PROVIDES PERMANENT STABILIZATION FOR AT LEAST 70 PERCENT OF THE DISTURBED SOIL SURFACE, EXCLUSIVE OF AREAS THAT HAVE BEEN PAVED.
10. OTHER POLLUTANT CONTROLS
   (A) DUST CONTROL - CONSTRUCTION TRAFFIC MUST ENTER AND EXIT THE SITE AT THE STABILIZED CONSTRUCTION EXIT. THE PURPOSE IS TO TRAP DUST AND MUD THAT WOULD OTHERWISE BE CARRIED OFF-SITE BY CONSTRUCTION EQUIPMENT.

   WATER TRUCKS OR OTHER DUST CONTROL AGENTS WILL BE USED AS NEEDED DURING CONSTRUCTION TO REDUCE DUST GENERATED ON THE SITE. DUST CONTROL MUST BE PROVIDED BY THE GENERAL CONTRACTOR TO A DEGREE THAT IS ACCEPTABLE TO THE OWNER'S CONSTRUCTION MANAGER, AND IN COMPLIANCE WITH APPLICABLE LOCAL AND STATE DUST CONTROL REGULATIONS. AFTER CONSTRUCTION, THE SITE WILL BE STABILIZED (AS DESCRIBED ELSEWHERE), WHICH WILL REDUCE THE POTENTIAL FOR DUST GENERATION.
   (B) SOLID WASTE DISPOSAL - NO SOLID MATERIALS, INCLUDING BUILDING MATERIALS, ARE ALLOWED TO BE DISCHARGED FROM THE SITE WITH STORM WATER. ALL SOLID WASTE, INCLUDING DISPOSABLE MATERIALS INCIDENTAL TO THE MAJOR CONSTRUCTION ACTIVITIES, MUST BE COLLECTED AND PLACED IN CONTAINERS. THE CONTAINERS WILL BE EMPTIED AS NECESSARY BY A CONTRACT TRASH DISPOSAL SERVICE AND HAULED AWAY FROM THE SITE. THE LOCATION OF SOLID WASTE RECEPTACLES SHALL BE SHOWN AND APPROVED BY THE OWNER.

   SUBSTANCES THAT HAVE THE POTENTIAL FOR POLLUTING SURFACE AND/OR GROUNDWATER MUST BE CONTROLLED BY WHATEVER MEANS NECESSARY IN ORDER TO ENSURE THAT THEY DO NOT DISCHARGE FROM THE SITE. FOR EXAMPLE, SPECIAL CARE MUST BE EXERCISED DURING EQUIPMENT FUELING AND SERVICING OPERATIONS. IF A SPILL OCCURS, IT MUST BE CONTAINED AND DISPOSED SO THAT IT WILL NOT FLOW FROM THE SITE OR ENTER GROUNDWATER, EVEN IF THIS REQUIRES REMOVAL, TREATMENT, AND DISPOSAL OF SOIL. IN THIS REGARD, POTENTIALLY POLLUTING SUBSTANCES SHOULD BE HANDLED IN A MANNER CONSISTENT WITH THE IMPACT THEY REPRESENT.
   (C) SANITARY FACILITIES - ALL PERSONNEL INVOLVED WITH CONSTRUCTION ACTIVITIES MUST COMPLY WITH STATE AND LOCAL SANITARY OR SEPTIC SYSTEM REGULATIONS. TEMPORARY SANITARY FACILITIES MUST BE PROVIDED AT THE SITE THROUGHOUT THE CONSTRUCTION PHASE. THEY MUST BE UTILIZED BY ALL CONSTRUCTION PERSONNEL AND MUST BE SERVICED BY A COMMERCIAL OPERATOR.
   (D) WATER SOURCE - NON-STORM WATER COMPONENTS OF SITE DISCHARGE MUST BE CLEAN WATER. WATER USED FOR CONSTRUCTION WHICH DISCHARGES FROM THE SITE MUST ORIGINATE FROM A PUBLIC WATER SUPPLIER, OR PRIVATE WELL APPROVED BY THE STATE HEALTH DEPARTMENT. WATER USED FOR CONSTRUCTION THAT DOES NOT ORIGINATE FROM AN APPROVED PUBLIC SUPPLY MUST NOT DISCHARGE FROM THE SITE. IT CAN BE RETAINED IN THE PONDS UNTIL IT INFILTRATES AND EVAPORATES.
   (E) CONCRETE WASTE FROM CONCRETE READY-MIX TRUCKS - DISCHARGE OF EXCESS OR WASTE CONCRETE AND/OR WASH WATER FROM CONCRETE TRUCKS WILL BE ALLOWED ON THE CONSTRUCTION SITE, BUT ONLY IN SPECIFICALLY DESIGNATED DIKED AREAS PREPARED TO PREVENT CONTACT BETWEEN THE CONCRETE AND/OR WASH WATER AND STORM WATER THAT WILL BE DISCHARGED FROM THE SITE. ALTERNATIVELY, WASTE CONCRETE CAN BE PLACED INTO FORMS TO MAKE RIP-RAP OR OTHER USEFUL CONCRETE PRODUCTS. THE CURED RESIDUE FROM THE CONCRETE WASHOUT DIKED AREAS SHALL BE DISPOSED IN ACCORDANCE WITH APPLICABLE STATE AND FEDERAL REGULATIONS. THE JOB SITE SUPERINTENDENT IS RESPONSIBLE FOR ASSURING THAT THESE PROCEDURES ARE FOLLOWED.
   (F) FUEL TANKS - TEMPORARY ON-SITE FUEL TANKS FOR CONSTRUCTION VEHICLES SHALL MEET ALL STATE AND FEDERAL REGULATIONS. TANKS SHALL HAVE APPROVED SPILL CONTAINMENT WITH THE CAPACITY REQUIRED BY THE APPLICABLE REGULATIONS. THE TANK SHALL BE IN SOUND CONDITION FREE OF RUST OR OTHER DAMAGE WHICH MIGHT COMPROMISE CONTAINMENT. HOSES, VALVES, FITTINGS, CAPS, FILLER NOZZLES, AND ASSOCIATED HARDWARE SHALL BE MAINTAINED IN PROPER WORKING CONDITION AT ALL TIMES.
11. MINIMIZING EROSION AND RUNOFF DURING TRENCH OPERATIONS
   (A) EXCAVATED TRENCH MATERIALS SHALL BE PLACED ON THE UPPER SIDE OF THE TRENCH WHILE THE TRENCH IS OPEN.
   (B) EXCAVATED TRENCH MATERIAL, UPON COMPLETING WORK IN TRENCH, SHALL BE PLACED BACK IN THE TRENCH OR HAULED AWAY TO A PROPER SPOIL SITE. THE TRENCH SHALL BE BACKFILLED AND STABILIZED AT THE END OF EACH WORKING DAY.

ENGINEER:
DELTA 3
LAND PLANNING & DESIGN
PROFESSIONAL CIVIL, MUNICIPAL & STRUCTURAL ENGINEERING
GRADING • UTILITIES • LAND DEVELOPMENT • PLANNING & CADD SERVICES
825 SOUTH CHESTNUT STREET PHONE: (608) 348-5355
PLATTEVILLE, WISCONSIN 53818
800 JACKSON STREET PHONE: (920) 342-9000
DURAND, WISCONSIN 54749

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:

MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

CASSVILLE, WI

PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE; 100 W. AMELIA STREET, CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:
-/-/----		-----

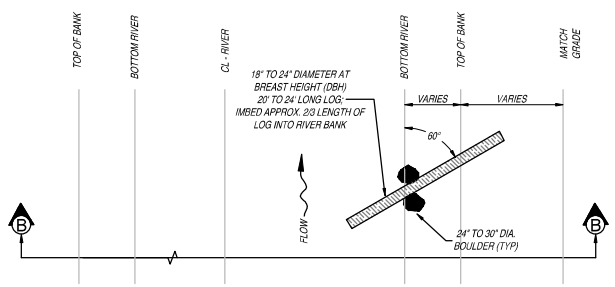
PRELIMINARY

PROJECT NUMBER	D20-187
SHEET SCALE	NOT TO SCALE
DRAWN BY	C.COYIER
DATE ISSUED	SEPTEMBER 19, 2025
SHEET DESC.	DETAILS - EROSION CONTROL & NOTES

SHEET TITLE:

C201

SHEET NUMBER # 5 of 7

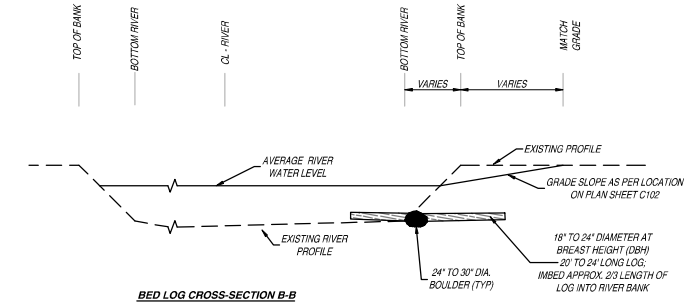


BED LOG DETAIL - PLAN VIEW

SCALE: N.T.S.

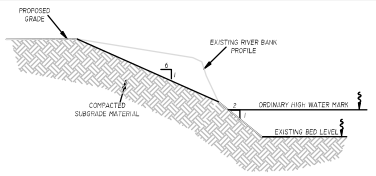
HABITAT NOTES:

1 - LOCATIONS AND ORIENTATION OF LARGE WOODY MATERIAL (LWM) AS SHOWN ON THIS SHEET ARE APPROXIMATE. FINAL LOCATIONS TO BE DETERMINED ON SITE BY THE ENGINEER.



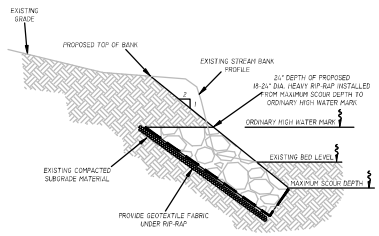
BED LOG CROSS-SECTION B-B

SCALE: N.T.S.



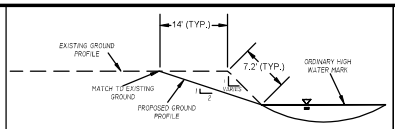
STREAMBANK GRADING (6:1 SLOPES) DETAIL

SCALE: N.T.S.



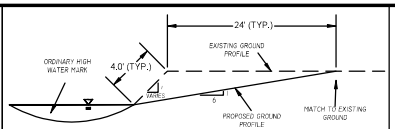
STREAMBANK GRADING (2:1 SLOPES) WITH RIP-RAP TO TOP OF BANK DETAIL

SCALE: N.T.S.



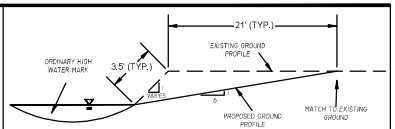
TYPICAL CROSS SECTION DETAIL (ID - A)

SCALE: N.T.S.



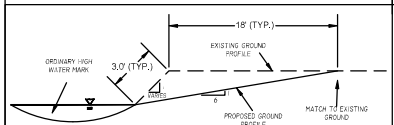
TYPICAL CROSS SECTION DETAIL (ID - A.1a)

SCALE: N.T.S.



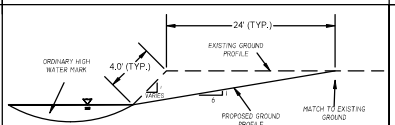
TYPICAL CROSS SECTION DETAIL (ID - A.1b)

SCALE: N.T.S.



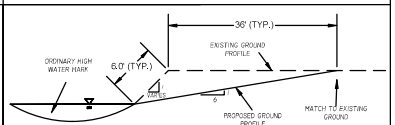
TYPICAL CROSS SECTION DETAIL (ID - A.1c)

SCALE: N.T.S.



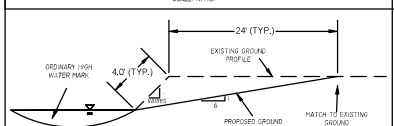
TYPICAL CROSS SECTION DETAIL (ID - A.1d)

SCALE: N.T.S.



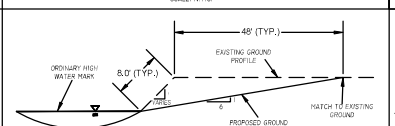
TYPICAL CROSS SECTION DETAIL (ID - A.1e)

SCALE: N.T.S.



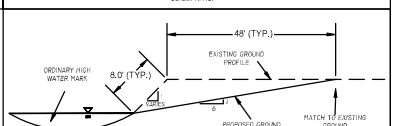
TYPICAL CROSS SECTION DETAIL (ID - A.1f)

SCALE: N.T.S.



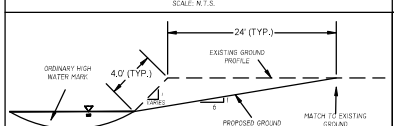
TYPICAL CROSS SECTION DETAIL (ID - A.1g)

SCALE: N.T.S.



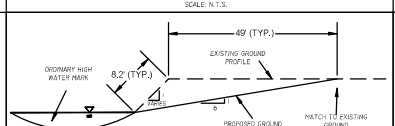
TYPICAL CROSS SECTION DETAIL (ID - A.1h)

SCALE: N.T.S.



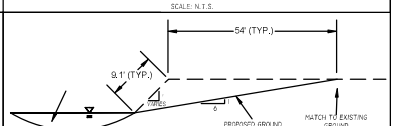
TYPICAL CROSS SECTION DETAIL (ID - A.1i)

SCALE: N.T.S.



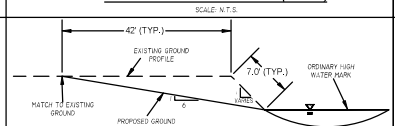
TYPICAL CROSS SECTION DETAIL (ID - A.3)

SCALE: N.T.S.



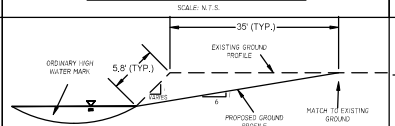
TYPICAL CROSS SECTION DETAIL (ID - C)

SCALE: N.T.S.



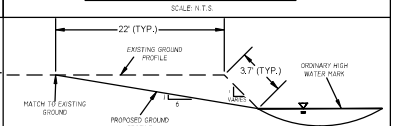
TYPICAL CROSS SECTION DETAIL (ID - F)

SCALE: N.T.S.



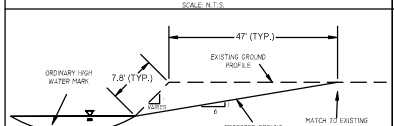
TYPICAL CROSS SECTION DETAIL (ID - G)

SCALE: N.T.S.



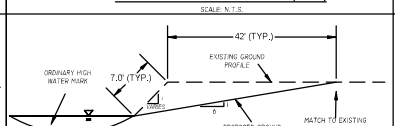
TYPICAL CROSS SECTION DETAIL (ID - H)

SCALE: N.T.S.



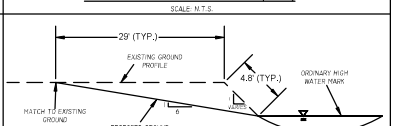
TYPICAL CROSS SECTION DETAIL (ID - I)

SCALE: N.T.S.



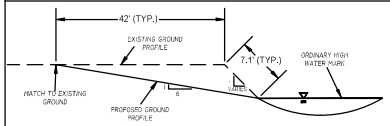
TYPICAL CROSS SECTION DETAIL (ID - J)

SCALE: N.T.S.



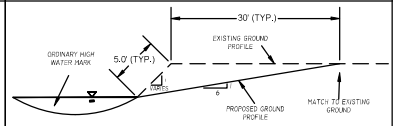
TYPICAL CROSS SECTION DETAIL (ID - K)

SCALE: N.T.S.



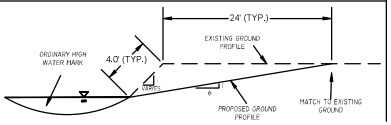
TYPICAL CROSS SECTION DETAIL (ID - L)

SCALE: N.T.S.



TYPICAL CROSS SECTION DETAIL (ID - M.1)

SCALE: N.T.S.



TYPICAL CROSS SECTION DETAIL (ID - M.2)

SCALE: N.T.S.

ENGINEER:

DELTA 3
WATER RESOURCES

PROFESSIONAL CIVIL, MUNICIPAL & STRUCTURAL ENGINEERING
GRADE WATER • LAND DEVELOPMENT • PLANNING & CADD SERVICES

826 SOUTH CHESTNUT STREET
PLATTEVILLE, WISCONSIN 53818
PHONE: (608) 348-5355

505 JACKSON STREET
DUBUQUE, IOWA 52001
PHONE: (563) 542-9006

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:

MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

CASSVILLE, WI

PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE

OWNER: VILLAGE OF CASSVILLE: 100 W. AMELIA STREET, CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:
-/-/----		-----

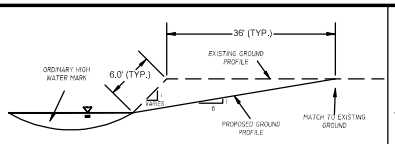
PRELIMINARY

PROJECT NUMBER	D20-187
SHEET SCALE	NOT TO SCALE
DRAWN BY	C.COYIER
DATE ISSUED	SEPTEMBER 18, 2025
SHEET DESC.	DETAILS - STREAM BANK

SHEET TITLE:

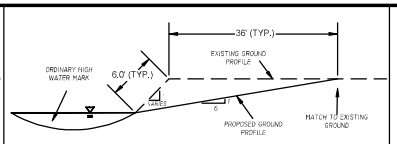
C202

SHEET NUMBER # 6 of 7



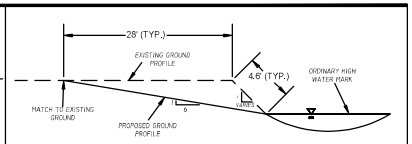
TYPICAL CROSS SECTION DETAIL (ID - M.3)

SCALE: N.T.S.



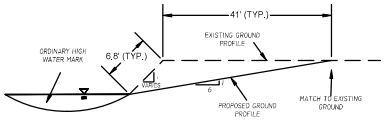
TYPICAL CROSS SECTION DETAIL (ID - M.4)

SCALE: N.T.S.



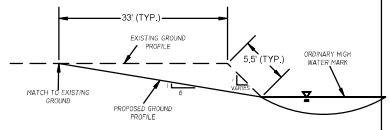
TYPICAL CROSS SECTION DETAIL (ID - N)

SCALE: N.T.S.



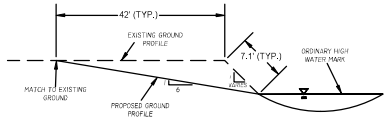
TYPICAL CROSS SECTION DETAIL (ID - O)

SCALE: N.T.S.



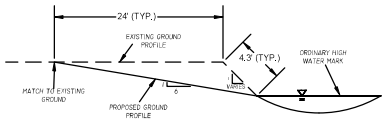
TYPICAL CROSS SECTION DETAIL (ID - P)

SCALE: N.T.S.



TYPICAL CROSS SECTION DETAIL (ID - Q)

SCALE: N.T.S.



TYPICAL CROSS SECTION DETAIL (ID - R)

SCALE: N.T.S.

ENGINEER:

DELTA 3
ENGINEERING, LLC
PROFESSIONAL CIVIL, MUNICIPAL, & STRUCTURAL ENGINEERING
GRANT WRITING • LAND DEVELOPMENT • PLANNING & CAD SERVICES

826 SOUTH CHESTNUT STREET — PHONE: (608) 348-5355
PLATTEVILLE, WISCONSIN 53818

505 JACKSON STREET — PHONE: (715) 342-9335
DUBUQUE, IOWA 52001

FOR QUESTIONS REGARDING THIS PROJECT, PLEASE CONTACT:

MR. JORDAN FURE, P.E.
DELTA 3 ENGINEERING, INC.
TELEPHONE: (608) 348-5355

PROPOSED STREAM BANK IMPROVEMENTS - MILL CREEK

CASSVILLE, WI

PROJECT LOCATION: MILL CREEK - EAST OF VILLAGE
OWNER: VILLAGE OF CASSVILLE, 100 W. AMELIA STREET, CASSVILLE, WISCONSIN 53806

REVISIONS:		
NO.	DATE	DESCRIPTION
AS-BUILT:		BY:
-/-/-		-

PRELIMINARY

PROJECT NUMBER	D25-187
SHEET SCALE	NOT TO SCALE
DRAWN BY	C.COYIER
DATE ISSUED	SEPTEMBER 19, 2025
SHEET DESC.	DETAILS - STREAM BANK

SHEET TITLE:

C203

SHEET NUMBER # 7 of 7