

Permit Fact Sheet

General Information

Permit Number	WI-0020290-11-0
Permittee Name and Address	Slinger Wastewater Treatment Facility 300 Slinger Road, Slinger, WI 53086
Permitted Facility Name and Address	Slinger Wastewater Treatment Facility 120 MBW Road, Slinger WI 53086
Permit Term	January 01, 2027 to December 31, 2031
Discharge Location	South bank of the tributary of the Rubicon River, approximately 700' SW from the end of Weil Drive. SW1/4, NW1/4, Section 18, T10N, R19E
Receiving Water	Tributary of the Rubicon River (Rubicon River Watershed, UR11 – Upper Rock River Basin) in Washington County
Stream Flow ($Q_{7,10}$)	0.01 cfs
Stream Classification	Limited Aquatic Life, non-public water supply, recreational use Rubicon River, downstream of the confluence with the tributary: Warm Water Sport Fish
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	1.5 MGD
Industrial or Commercial Contributors	None
Plant Classification	Advanced. A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Slinger operates an activated sludge wastewater treatment facility that includes a mechanical bar screen, influent flow pumps, a grit removal system, a three-ring oxidation ditch, two clarifiers, and ultraviolet disinfection. The outer ring of the oxidation ditch is set for anoxic conditions for biological phosphorus removal. Polyaluminum chloride is added before clarification for additional phosphorus removal. The facility accepts hauled waste from domestic holding tanks and septic tanks. Waste activated sludge is gravity thickened and stored on-site prior to land application on Department approved sites.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, a site visit on April 16, 2025, and a desk top review on August 5, 2026, this facility has been found to be in substantial compliance with their current permit.

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	0.69 MGD (Annual Average 2025)	Influent: 24-hour flow proportional composite samples shall be collected from the influent channel prior to the mechanical bar screen. A magnetic flow meter is located on the influent pipe in the headworks building.
101	0.04 MGD (Annual Average 2025)	Chloride Sampling: Sample point for tracking chloride concentration and volume of hauled domestic holding tank, septic tank and commercial and light industrial wastewater. Magnetic flow meter located in a manhole between the septage receiving station and the headworks building.
106	544 GPD (Annual Average 2025)	Chloride Sampling: Sample point for tracking chloride and volume contributions from Washington County Highway Department Garage.
107	N/A – Not required to report	Field Blank: Collect total recoverable mercury field blanks at the same time and location as the mercury effluent sample using standard sample handling procedures.
001	0.72 MGD (Average October 2020 – June 2025)	Effluent: 24-hour flow proportional composite samples shall be collected prior to UV disinfection. Grab samples shall be collected after the aeration steps. A Parshall flume and transducer measure flow in the channel between UV disinfection and aeration steps.
002	270 dry U.S. tons (2024)	Gravity thickened, Class B, liquid sludge. Representative grab samples shall be collected from the discharge end of the sludge holding tank sludge pump, immediately following mixing.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT PLANT

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,		mg/L	3/Week	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Total				Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	See Mercury Monitoring permit section.

Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

Mercury: The sample frequency has changed to quarterly.

Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, 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 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 101- Hauled Wastes

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Volume		gal	Daily	Continuous	Report the total volume in gallons for each day hauled waste is received.
Chloride		mg/L	Per Occurrence	Grab Comp	Sample shall be a composite of equal portions from each truck load of waste for a given day.

Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

Volume: The sample frequency and sample type have changed daily and continuous, respectively, for eDMR reporting purposes and to reflect operations at the WWTF.

Sample Point Number: 106- Washington Cty Hwy Dept

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Volume		gal	Monthly	Estimated	Estimated based on Hwy Dept. monthly water meter

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					reading.
Chloride		mg/L	Per Occurrence	Grab	

Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

Volume: The sample frequency has changed to monthly for eDMR reporting purposes and to reflect operations at the WWTF.

2.2 Sample Point Number: 107- Field Blanks

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See Mercury Monitoring permit section.

Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

Mercury: The sample frequency has changed to quarterly.

Explanation of Limits and Monitoring Requirements

Mercury Field Blank: Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

3 Surface Water - Monitoring and Limitations

3.1 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	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
				Prop Comp	
Suspended Solids, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	317 lbs/day	3/Week	Calculated	January, March, May, July, August, October, December
Suspended Solids, Total	Weekly Avg	351 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Weekly Avg	329 lbs/day	3/Week	Calculated	April, June, September, November
Suspended Solids, Total	Monthly Avg	225 lbs/day	3/Week	Calculated	January, March, May, July, August, October, December
Suspended Solids, Total	Monthly Avg	249 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Monthly Avg	233 lbs/day	3/Week	Calculated	April, June, September, November
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	11 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	10 mg/L	3/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.4 mg/L	3/Week	24-Hr Flow Prop Comp	April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	2.6 mg/L	3/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.1 mg/L	3/Week	24-Hr Flow Prop Comp	October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.1 mg/L	3/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.6 mg/L	3/Week	24-Hr Flow Prop Comp	April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	May - September

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	3.6 mg/L	3/Week	24-Hr Flow Prop Comp	October
E. coli	Geometric Mean - Monthly	126 #/100 ml	2/Week	Grab	Limit effective May - September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May - September annually. See E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.
Chloride	Daily Max	760 mg/L	4/Month	24-Hr Flow Prop Comp	Sampling shall be conducted on four consecutive days one week per month.
Chloride	Weekly Avg	605 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective November - April. Sampling shall be conducted on four consecutive days one week per month. See the Chloride Variance - Implement Source Reduction Measures permit section and the Chloride SRM (Target Value) Schedule.
Chloride	Weekly Avg	555 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective May - October. Sampling shall be conducted on four consecutive days one week per month. See the Chloride Variance - Implement Source Reduction Measures permit section and the Chloride SRM (Target Value) Schedule.
Chloride		lbs/day	4/Month	Calculated	Calculate the daily mass discharge of chloride in lbs/day on the same days chloride sampling occurs. Mass (lbs/day) = Concentration (mg/L) x

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Flow (MGD) x 8.34
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See Mercury Monitoring permit section.
Phosphorus, Total	Monthly Avg	0.6 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level.
Phosphorus, Total	Monthly Avg	14.47 lbs/day	3/Week	Calculated	January
Phosphorus, Total	Monthly Avg	19.14 lbs/day	3/Week	Calculated	February
Phosphorus, Total	Monthly Avg	14.97 lbs/day	3/Week	Calculated	March
Phosphorus, Total	Monthly Avg	11.88 lbs/day	3/Week	Calculated	April
Phosphorus, Total	Monthly Avg	10.39 lbs/day	3/Week	Calculated	May
Phosphorus, Total	Monthly Avg	9.16 lbs/day	3/Week	Calculated	June
Phosphorus, Total	Monthly Avg	9.30 lbs/day	3/Week	Calculated	July
Phosphorus, Total	Monthly Avg	9.37 lbs/day	3/Week	Calculated	August
Phosphorus, Total	Monthly Avg	10.36 lbs/day	3/Week	Calculated	September
Phosphorus, Total	Monthly Avg	10.08 lbs/day	3/Week	Calculated	October
Phosphorus, Total	Monthly Avg	10.55 lbs/day	3/Week	Calculated	November
Phosphorus, Total	Monthly Avg	12.22 lbs/day	3/Week	Calculated	December
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) permit section. Available TP Credits are specified in Table 2 of the permit and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) permit section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Compliance with the six-month average limit is

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Computed Compliance (TP)	6-Month Avg	0.94 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3b. in the Water Quality Trading (WQT) permit section. Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Credits Used (TP)	Annual Total	61.6 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed values listed in Table 2 of the permit.
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.
Acute WET	Daily Max	1.0 TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Whole Effluent Toxicity (WET) Testing permit section.
Chronic WET	Monthly Avg	1.0 TUC	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Whole Effluent Toxicity (WET) Testing permit section.

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.

Dissolved Oxygen: The sample frequency has changed to daily.

Ammonia: The daily maximum limit has been updated. The sample frequency has changed to 3/week.

E. coli: The sample frequency has changed to 2/week.

Chloride: A mass reporting requirement for chloride has been included in the permit and updated source reduction measures plan activities (SRMs) throughout the permit term.

Chronic WET: A monthly average limit has been included 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 for Slinger Wastewater Treatment Facility dated October 17, 2025, prepared by Nicole Krueger, and used for this reissuance.

Ammonia: In accordance with s. NR 106.32(2), Wis. Adm. Code, daily maximum ammonia limitations are calculated using the 1-Q₁₀ 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 1-Q₁₀ method yields the most stringent limits for Slinger WWTF. The daily maximum limit of 11 mg/L is more stringent than the previous daily maximum limit of 13 mg/L due to a small increase in the expected effluent pH.

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

Chloride: The permittee has applied for a chloride variance, under the provisions of s. NR 106.83, Wis. Adm. Code, with its application for permit reissuance. The Department reviewed Slinger's application for a chloride variance and the information supplied in the application supports the establishment of an interim effluent limit. The permittee and the Department have reached agreement on an interim chloride limit of 555 mg/L (May – October) and 605 mg/L (November – April) expressed as weekly averages, a target value of 500 mg/L (weekly average), implementation of the chloride source reduction measures (SRMs) plan dated 7/20/2026, and submittal of annual progress reports each year by January 31st. The Department concludes that Slinger is eligible for a variance from the water quality standard for chloride and proposes reissuance of this permit with the proposed variance.

Phosphorus: Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in ch. NR 217, Wis. Adm. Code, there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for the Rubicon River is 0.075 mg/L. In this case, the WQBELs are 0.225 mg/L (monthly average), 0.075 mg/L & 0.94 lbs/day (6-month average). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.225 mg/L). These final effluent limits were derived from and comply with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. The minimum control level (MCL) of 0.6 mg/L will be retained in the permit.

The wastewater treatment facility is not able to meet the WQBEL. This permit authorizes the use of trading as a tool to demonstrate compliance with the phosphorus WQBELs. This permit includes terms and conditions related to the Water Quality Trading Plan (WQT-2026-0015) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Village is implementing streambank stabilization that includes habitat

features. The WQT Plan proposes the generation of 61.6 lbs/yr of phosphorus credit for the next five years. Interim credits expire in 2031, therefore only 45 lbs/yr of phosphorus credit are available starting in 2032.

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

Chronic WET: WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

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. Slinger WWTF has good compliance history with little variability in the effluent. There were no effluent limit violations for BOD, TSS, Ammonia, and Phosphorus during the prior permit term. The Department has determined the minimum sample frequency in guidance is appropriate for these parameters. The sample frequency for pH and DO is daily, specifically to align Slinger with facilities of similar type and size and to better capture effluent quality of these operational parameters. Sample frequencies will be evaluated at each permit reissuance.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal Coliform	Aerobic Composting Process	Hauled to Permitted Facility	270 (2024)
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? Yes Well# EM272, Sample Date 3/4/26, Result 3.78 pCi/L 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.						

4.1 Sample Point Number: 002- Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Grab	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Grab	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Grab	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Grab	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Grab	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Grab	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Grab	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Grab	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Grab	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Grab	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Grab	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Grab	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Grab	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Grab	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Grab	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Grab	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Grab	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Grab	
Nitrogen, Total Kjeldahl		Percent	Annual	Grab	
Nitrogen, Ammonium (NH ₄ -N) Total		Percent	Annual	Grab	
Phosphorus, Total		Percent	Annual	Grab	
Phosphorus, Water Extractable		% of Tot P	Annual	Grab	
Potassium, Total Recoverable		Percent	Annual	Grab	
Radium 226 Dry Wt		pCi/g	Annual	Grab	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Grab	Once in 2028
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Grab	Once in 2028
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS permit sections for more

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

Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

Radium: Annual monitoring has been included in the permit.

PCB: The year in which to monitor for PCB has been updated to 2028.

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). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

PFAS: The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS” should be followed.

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.

5 Schedules

5.1 Chloride Source Reduction Measures (Target Value)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the Source Reduction Plan have been implemented and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and	01/31/2027

identify actions planned for the upcoming year; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	
Annual Chloride Progress Report #2: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2028
Annual Chloride Progress Report #3: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2029
Annual Chloride Progress Report #4: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2030
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 500 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall: Summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why; Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride as identified in the source reduction plan. If the permittee intends to reapply for a chloride variance, for the reissued permit, proposed target limits and a detailed source reduction measures plan, outlining the source reduction activities proposed for the upcoming permit term, shall also be included per ss. NR 106.90 (5) and NR 106.83 (4), Wis. Adm. Code. An updated source reduction measures plan shall: Include an explanation of why or how each source reduction measure will result in reduced discharge of the target pollutant; and Evaluate any available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and Identify any information needs that would help to better determine pollutant sources and make plans to collect that information. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures but is not an enforceable limitation under the terms of this permit.	01/31/2031
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual	

Chloride Progress Reports shall include the information as defined above.	
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Explanation of Schedule

This schedule is required to ensure that the permittee maintains compliance with the conditions and requirements of receiving a variance from the water quality-based chloride effluent limits. Since a compliance schedule is being granted, an interim limit is required, and that limit is established as 555 mg/L (May – October) and 605 mg/L (November – April) as weekly averages. The schedule requires that annual reports shall indicate which source reduction measures have been implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 500 mg/L (weekly average) by the end of the permit term.

5.2 Water Quality Trading (WQT) Annual Report

Required Action	Due Date
Annual WQT Report: Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include: The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance; The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source; Results of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports.	01/31/2027
Annual WQT Report #2: Submit an annual WQT report that shall cover the previous year.	01/31/2028
Annual WQT Report #3: Submit an annual WQT report that shall cover the previous year.	01/31/2029
Annual WQT Report #4: Submit an annual WQT report that shall cover the previous year.	01/31/2030
Annual WQT Report #5: Submit the 5th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	01/31/2031
Annual WQT Report Required After Permit Expiration: In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

Explanation of Schedule

Reports are required that include the following information:

- Verification that site inspections occurred;
- Results of site inspection findings;
- Identification of noncompliance or failure to implement any terms or conditions of the permit or trading plan that have not been reported in discharge monitoring reports;

- Any applicable notices of termination or management practice registration; and
- A summary of credits used each month over the calendar year

5.3 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit a 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. The plan is due sixty (60) days prior to land applying.	

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.

Attachments

Water Quality Based Effluent Limits dated October 17, 2025

Chloride Variance EPA Data Sheet

Slinger Wastewater Treatment Facility Source Reduction Measures (SRM) Plan dated July 20, 2026

WQT Conditional Approval Letter dated June 3, 2026

Water Quality Trading Plan dated September 2025

Justification Of Any Waivers From Permit Application Requirements

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

Prepared By: BetsyJo Howe, Wastewater Specialist

Date: 8/19/2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 10/17/2025

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Slinger Wastewater Treatment Facility
WPDES Permit No. WI-0020290-11

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 Slinger Wastewater Treatment Facility in Washington County. This municipal wastewater treatment facility (WWTF) discharges to the Tributary to the Rubicon River, located in the Rubicon River Watershed in the Upper Rock River Basin. This discharge is included in the Rock River Total Maximum Daily Load (TMDL) as approved by EPA on 09/28/2011.

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						1,2
BOD ₅	30 mg/L			15 mg/L		1
TSS TMDL	30 mg/L		See Table	20 mg/L See Table		1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
Ammonia Nitrogen						
April	11 mg/L		6.4 mg/L	2.6 mg/L		
May – September	11 mg/L		2.6 mg/L	1.0 mg/L		
October	11 mg/L		9.1 mg/L	3.6 mg/L		
November – March	11 mg/L		10 mg/L	4.1 mg/L		
<i>E. coli</i>				126 #/100 mL		1,4
May – September				geometric mean		
Chloride	760 mg/L		400 mg/L 8,500 lbs/day			5
Mercury						1,2
Phosphorus						3,6
MCL				0.6 mg/L		
217.13 WQBEL				0.225 mg/L	0.075 mg/L	
TMDL				See Table		
TKN, Nitrite+Nitrate, and Total Nitrogen						7
Acute WET	1.0 TU _a					8,9

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Chronic WET				1.0 TUc		8,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL

Month	Weekly Average TSS Effluent Limit (lbs/day)	Monthly Average TSS Effluent Limit (lbs/day)	Monthly Average TP Effluent Limit (lbs/day)
January	317	225	14.47
February	351	249	19.14
March	317	225	14.97
April	329	233	11.88
May	317	225	10.39
June	329	233	9.16
July	317	225	9.30
August	317	225	9.37
September	329	233	10.36
October	317	225	10.08
November	329	233	10.55
December	317	225	12.22

4. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. These are the WQBELs for chloride. Alternative effluent limitations of 555 mg/L for May – October and 605 mg/L for November – April as weekly averages may be included in the permit in place of the weekly average limit if the chloride variance application that was submitted is approved by EPA.
6. Slinger is complying with the final phosphorus limits through water quality trading. The end of pipe minimum control level (MCL) of 0.6 mg/L shall continue in the reissued permit.
7. 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 municipal major permittees. 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 (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
8. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 100%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from

the tributary to the Rubicon River upstream of the outfall and outside of the mixing zone, or moderately hard laboratory water if no flow is present

9. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Outfall Map & 2008 Ammonia Limits Calculations

PREPARED BY: Nicole Krueger, Water Quality Engineer – SER

E-cc: Nick Lent, Wastewater Engineer – SER
 Diane Figiel, Water Resources Engineer – WY/3
 Nate Willis, Wastewater Engineer – WY/3

Attachment #1
**Water Quality-Based Effluent Limitations for
Slinger Wastewater Treatment Facility**

WPDES Permit No. WI-0020290-11

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Slinger Wastewater Treatment Facility consists of a mechanical bar screen, influent flow pumps, a grit removal system, a three-ring oxidation ditch, two clarifiers, and an ultraviolet disinfection system. Polyaluminum chloride (PAC) is added at the splitter box after the oxidation ditch, just before clarification. Ultraviolet disinfection is used May-September before discharge to a tributary of the Rubicon River. Waste activated sludge is gravity thickened and stored in two sludge tanks before removal by a licensed and permitted contract hauler.

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

Existing Permit Limitations

The current permit, expiring on September 30, 2025, 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	30 mg/L			15 mg/L		2,3
TSS TMDL	30 mg/L		See Table	20 mg/L See Table		3,4
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2
Ammonia Nitrogen						
April	13 mg/L		6.4 mg/L	2.6 mg/L		
May – September	13 mg/L		2.6 mg/L	1.0 mg/L		
October	13 mg/L		9.1 mg/L	3.6 mg/L		
November – March	13 mg/L		10 mg/L	4.1 mg/L		
<i>E. coli</i>				126 #/100 mL		5
May – September				geometric mean		
Chloride						6
May – October			555 mg/L			
November – April			605 mg/L			
Mercury						1
Phosphorus						4,7
MCL				0.6 mg/L		
TMDL				See Table		
217.13 WQBEL				0.225 mg/L	0.075 mg/L 0.94 lbs/day	

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrite+Nitrate, and Total Nitrogen						1
Acute WET	1.0 TU _a					8
Chronic WET						8

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. These limits are based on the Limited Forage Fish (LFF) community of the immediate receiving water as described in s. NR 104.02(3)(a), Wis. Adm. Code.
4. These are Rock River TMDL limits which are currently effective.

Month	Weekly Average TSS Effluent Limit (lbs/day)	Monthly Average TSS Effluent Limit (lbs/day)	Monthly Average TP Effluent Limit (lbs/day)
January	317	225	14.47
February	351	249	19.14
March	317	225	14.97
April	329	233	11.88
May	317	225	10.39
June	329	233	9.16
July	317	225	9.30
August	317	225	9.37
September	329	233	10.36
October	317	225	10.08
November	329	233	10.55
December	317	225	12.22

5. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. These are interim variance limits.
7. The monthly average limit of 0.6 mg/L is the minimum control level (MCL) as the end of pipe limit. Slinger has been complying with the 217.13 WQBELs through water quality trading since July 2021.
8. Annual acute and chronic WET testing is required during the current permit term. The IWC for chronic WET was 100%.

Receiving Water Information

- Name: Unnamed tributary to the Rubicon River
- Waterbody Identification Code (WBIC): 858400
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: The unnamed tributary is listed in ch. NR 104, Wis. Adm. Code, as Limited Aquatic Life (LAL). The Rubicon River upstream of the confluence with the unnamed tributary is classified as Limited Forage Fish

(LFF). The Rubicon River downstream of the confluence with the tributary is classified as a warmwater sport fishery (WWSF), which is approximately 0.5 miles downstream of Outfall 001. None of the waters are public water supplies.

- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are from USGS for Station ID 673228, where Outfall 001 is located.
 - 7-Q₁₀ = 0.01 cubic feet per second (cfs)
 - 7-Q₂ = 0.01 cfs
 - 90-Q₁₀ = 0.01 cfs
 - Harmonic Mean Flow = 0.17 cfsThe Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 259 mg/L as CaCO₃. This value represents the geometric mean of data from the Rubicon River Watershed (n=23) from 04/11/1985 – 04/12/1995.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Rock River at Waupun is used for this evaluation because there is no data available for the Tributary to the Rubicon River or the Rubicon River. The Rock River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. Background chloride data was collected from the tributary to the Rubicon River at Station ID 673228 which is 300 feet upstream of Slinger's outfall. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None
- Impaired water status: The Rubicon River starting at mile 11.4 (approximately 3 miles downstream of Outfall 001) is 303(d) listed as impaired for total phosphorus.

Effluent Information

- Design flow rate(s):
 - Annual average = 1.5 million gallons per day (MGD)
 - Peak daily = 3.0 MGD
 - Peak weekly = 2.3 MGD
 - Peak monthly = 2.1 MGDFor reference, the actual average flow from 10/01/2020 – 06/30/2025 was 0.72 MGD.
- Hardness = 435 mg/L as CaCO₃. This value represents the geometric mean of data (n = 4) from 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 wastewater with zero industrial contributors. Zinc Inc. was previously the only industrial facility contributor but has closed.
- Water supply: Municipality waterworks and private wells.
- Additives: Slinger has included one additive in the permit application that have the potential to be present in Outfall 001. These additives are listed below:
 - ChemTrade Hyper Ion 4107 – Phosphorus removal

Attachment #1

- An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additives. Therefore, an additive review is not needed at this time.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for chloride, mercury, ammonia and phosphorus is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Chloride Effluent Data

	Chloride (mg/L)
1-day P ₉₉	756
4-day P ₉₉	644
30-day P ₉₉	580
Mean	546
Std	79.4
Sample size	912
Range	106 – 822

Copper Effluent Data

Sample Date	Copper µg/L
04/01/2025	0.4
04/04/2025	<0.4
04/07/2025	<0.4
04/10/2025	0.4
Average	0.2

“<” means that the pollutant was not detected at the indicated limit of detection. The average concentration was calculated using zero in place of the non-detected results.

Mercury Effluent Data

Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)
04/08/2019	0.68	05/31/2019	1.34	02/06/2023	1.3
04/11/2019	0.67	06/03/2019	1.61	07/11/2023	0.45
04/15/2019	0.91	06/06/2019	1.9	02/05/2024	0.56
04/18/2019	0.73	11/11/2020	<200*	08/26/2024	0.51
05/16/2019	0.39	03/15/2021	0.57	04/02/2025	0.52
05/20/2019	0.51	08/15/2021	0.23	07/23/2025	0.43
05/23/2019	1.62	03/23/2022	0.49		
05/28/2019	1.05	09/19/2022	0.46		
1-day P ₉₉ = 2.47 ng/L					
4-day P ₉₉ = 1.51 ng/L					

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Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)
30-day P ₉₉ = 1.03 ng/L					

*The 11/11/2020 sample of <200 ng/L is not used in this evaluation because the LOD used is significantly higher than typical and is not useful in this analysis

The following table presents the average concentrations and loadings at Outfall 001 from 10/01/2020 – 06/30/2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement	Average Mass
BOD ₅	3.29 mg/L*	
TSS	3.27 mg/L*	
pH field	7.73 s.u.	
Dissolved Oxygen	8.9 mg/L	
Ammonia Nitrogen	0.28 mg/L*	
<i>E. coli</i>	4.9 #/100 mL**	
Phosphorus	0.070 mg/L*	0.44 lbs/day
Chloride	546 mg/L	

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.

** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the 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 P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

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

Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow
which occurs once in 10 years (7-day Q₁₀).

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Slinger.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0.008 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		340	68.0	<1.1		
Cadmium	435	156	0.0165	157	31.3	<0.17		
Chromium	301	4446		4446	889	<3		
Copper	435	62.19	1.23	62.4	12.5	0.2		0.4
Lead	356	365	0.372	366	73.2	<5.4		
Mercury (ng/L)		830	4.74	833				1.62
Nickel	268	1080		1080	216	<3		
Zinc	333	345	1.9	346	69.2	20		
Chloride (mg/L)		757	59.4	759			756	822

* 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.

** Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q₁₀ flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.0025 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉	4-day MAX. CONC.
Arsenic		152.2		152.2	30.44	<1.1		
Cadmium	175	3.82	0.0165	3.82	0.76	<0.17		
Chromium	259	288		288	57.6	<3		
Copper	259	23.4	1.23	23.4	4.68	0.2		

Attachment #1

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK- GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉	4-day MAX. CONC.
Lead	259	70.2	0.372	70.3	14.1	<5.4		
Mercury (ng/L)		440	4.74	440			1.51	
Nickel	259	164		164	32.8	<3		
Zinc	259	277	1.9	277	55.4	20		
Chloride (mg/L)		395	59.4	395			644	814

* 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)

RECEIVING WATER FLOW = 0.0025 cfs (¼ of the 90-Q₁₀), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Mercury (ng/L)	1.3	4.74	1.3			1.03

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0.0425 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
Cadmium	880	0.0165	896	179	<0.17	
Chromium (+3)	8400000		8553819	1710764	<3	
Lead	2240	0.372	2281	456	<5.4	
Mercury (ng/L)	336	4.74	342			1.03
Nickel	110000		112014	22403	<3	
Dimethyl phthalate	56000000		57025463	11405093	0.135	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0.0425 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40		40	8.0	<1.1

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

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride. Limits and/or monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data from the current permit term (10/01/2020 – 06/30/2025), the 1-day P₉₉ chloride concentration is 756 mg/L, and the 4-day P₉₉ of effluent data is 644 mg/L.

The highest sample reported was 822 mg/L which is above the WQBEL of 759 mg/L. Therefore, **a daily maximum limit of 760 mg/L (rounded) is recommended in the reissued permit per s. NR 106.05(3)(a), Wis. Adm. Code.** Slinger can meet this limit upon reissuance, so no compliance schedule is recommended.

Because the 4-day P₉₉ exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code.

Subchapter VII of ch. NR 106, Wis. Adm. Code, provides for a variance from water quality standards for this substance, and Slinger has requested continuation of this variance for the weekly average limit. Slinger currently has a variance for weekly average chloride and has been implementing SRMs during the current permit term including inspections, education and replacement of brine application systems.

That variance may be approved to continue subject to the following conditions:

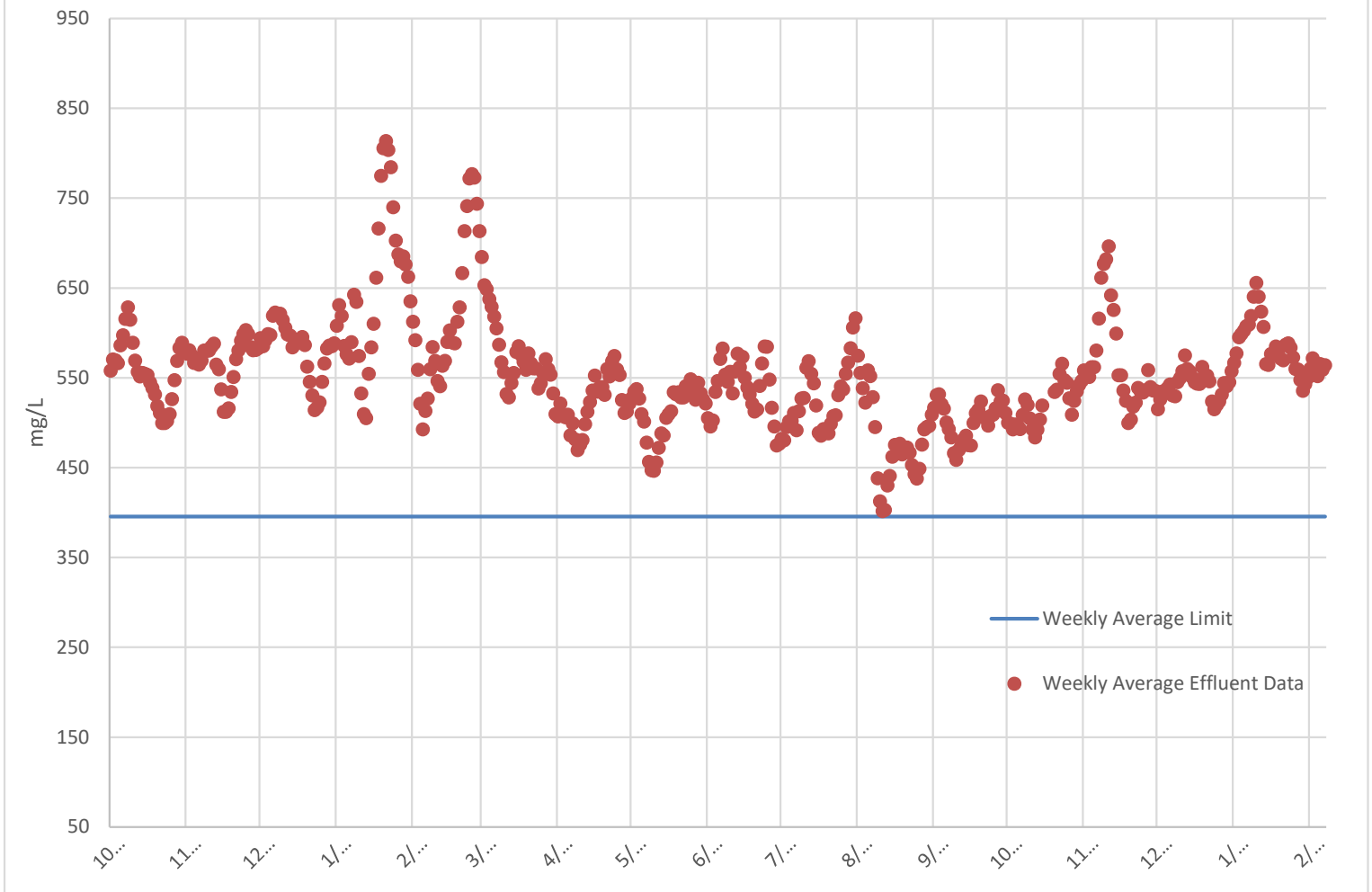
- 1) The permit shall include an “Interim” limitation intended to prevent an increase in the discharge of Chloride;
- 2) The permit shall specify “Source Reduction Measures” to be implemented during the permit term, with periodic progress reports; and
- 3) The permit shall include a “Target Limit” or “Target Value” to gage the effectiveness of the Source Reduction Measures, and progress toward the WQBELs.

Interim Limit for Chloride

Section NR 106.82(9), Wis. Adm. Code, defines a “Weekly average interim limitation” as either the 4-day P₉₉ concentration or 105% of the highest weekly average concentration of the representative data.

The graph below shows the weekly average effluent concentrations compared to the calculated weekly average WQBEL:

Chloride Data



The current permit has two seasonal variance interim limits for November – April and May – October. The effluent data from the current permit term is shown below for these two seasons:

Chloride Effluent Data

Chloride (mg/L)	November – April	May – October
1-day P ₉₉	783	706
4-day P ₉₉	670	607
30-day P ₉₉	606	550
Mean	571	519
Std	80.3	70.9
Sample size	453	467
Range	320 – 822	106 – 647

Attachment #1

The chloride statistics from this current permit term are very similar to the statistics from the previous permit term. The 4-day P₉₉ effluent chloride concentrations are greater than the current interim weekly average variance limits for both seasons (555 mg/L for May – October and 605 mg/L for November – April). Increasing the interim limits are counterproductive to meeting the final WQBEL; **therefore, the current limits are recommended to remain the same in the reissued permit.** The current interim limits are based on the previous 2008 and 2013 limit evaluation calculations of the seasonal 4-day P₉₉'s.

A target limit and permit language for Source Reduction Measures are not recommended as part of this evaluation. These should follow contact with Slinger. Though if the Department and Slinger are unable to reach agreement on all the terms of a chloride variance, the calculated limits described earlier should be included in the permit, in accordance with s. NR 106.83(3), Wis. Adm. Code.

Chloride Monitoring Recommendations

Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

In the absence of a variance, Slinger would be subject to the WQBEL of 640 mg/L (rounded) as a weekly average; the weekly average mass limit of 8,000 lbs/day ($644 \text{ mg/L} \times 1.5 \text{ MGD} \times 8.34$) (rounded); and an alternative wet weather mass limit. The wet weather mass limit applies when the dry weather mass limit is exceeded, and the facility demonstrates to the Department the exceedance occurred during a wet weather event.

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires 1/6 months monitoring of the influent and effluent for total recoverable mercury. A total of 11 effluent sampling results were available from the current permit term for total recoverable mercury. However, because one of the samples was reported as nondetect with an LOD of 200 ng/L, data that was collected during the previous permit term was also included in this analysis in order to calculate the P₉₉'s for reasonable potential purposes. Therefore, data from 04/08/2019 – 07/23/2025 is used in this evaluation. The average concentration was 0.81 ng/L, and the maximum was 1.9 ng/L. Because the 30-day P₉₉ of available data (1.03 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. Monitoring is recommended to continue in the reissued permit** consistent with other major municipal dischargers to determine reasonable potential at the next reissuance.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from the Slinger Waterworks (PWS ID: 26701169) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
09/12/2022	1335615	BH264	1.0	0.93
09/12/2022	1335613	BH263	ND	0.65
09/12/2022	1335617	EM272	ND	ND

Attachment #1

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
05/16/2023	WB02810-09	BH264	0.96	0.8
05/16/2023	WB02810-14	EM272	ND	ND
05/16/2023	WB02810-04	BH263	ND	0.78
Average =			0.327	0.527

Based on the actual effluent flow rate, the lack of indirect dischargers contributing to the collection system and known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is not recommended.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1671 sample results were reported from 10/01/2020 – 07/31/2025. The maximum reported value was 8.4 s.u. (Standard pH Units). The effluent pH was 8.1 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 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 8.1 s.u. Therefore, a value of 8.1 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 8.1 s.u. into the equation above yields an ATC = 10.7 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 the 1-Q₁₀ 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.

Attachment #1

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	21
1-Q ₁₀	11

The 1-Q₁₀ method yields the most stringent limits for Slinger. **This limit is more stringent than the current daily maximum limit of 13 mg/L** due to a small increase in the expected effluent pH.

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

Weekly and monthly average limits are not included in the current permit but are being evaluated here due to changes to ch. NR 106, Wis. Adm. Code. **The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the 2008 WQBEL memo are shown in Attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 10/01/2020 – 07/31/2025.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April	May - September	October	November – March
1-day P ₉₉	0.43	0.30	2.38	6.63
4-day P ₉₉	0.22	0.15	1.55	3.53
30-day P ₉₉	0.10	0.06	0.72	1.49
Mean*	0.04	0.02	0.14	0.59
Std	0.13	0.14	1.43	2.07
Sample size	100	497	123	509
Range	<0.051 - 0.74	<0.051 - 1.1	<0.051 - 7.99	<0.051 - 8.64

*Values lower than the limit of detection were substituted with a zero

Reasonable Potential

The need to include ammonia limits in Slinger's permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

However, since the permit currently has weekly and monthly average limits year-round, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

- (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April	11	6.4	2.6
June – September	11	2.6	1.0
October	11	9.1	3.6
November – March	11	10	4.1

PART 4 – 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 Slinger has a monthly average phosphorus limit in effect that is more stringent than 1.0 mg/L, the need for a TBEL will not be considered further. The monthly average limit of 0.6 mg/L is recommended to continue in the reissued permit.

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.

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The US EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices can be found at: <https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html>

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. The receiving water was not 303(d) listed as impaired at the time of TMDL development, so s. NR 217.16, Wis. Adm. Code limits are required in addition to the TMDL-based limits which is consistent with the current permit.

TMDL Limits – Phosphorus

The approved Rock River TMDL report provides effluent limitations that are given in lbs/month in the document *Final Rock River TMDL Report with Tables*. The monthly WLA were calculated as monthly averages in lbs/day as shown in the table below. **There are no changes recommended from the current permit.**

Total Phosphorus Effluent Limitations

Month	Monthly Total P WLA¹ (lbs/month)	Monthly Ave Total P Effluent Limit (lbs/day)
Jan	448.64	14.47
Feb	535.95	19.14
March	464.21	14.97
April	356.54	11.88
May	322.04	10.39
June	274.94	9.16
July	288.16	9.30
Aug	290.58	9.37
Sept	310.65	10.36
Oct	312.40	10.08
Nov	316.48	10.55
Dec	378.84	12.22

Footnotes:

1- Rock River TMDL Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility

Point of Discharge Limits – Phosphorus

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Slinger is classified as limited aquatic life downstream from the point of discharge downstream to the Rubicon River. The Rubicon River is classified for warm water sport fishery uses.

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

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

$$\text{Limitation} = [(WQC)(Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)]/Q_e$$

Where:

WQC = 0.075 mg/L for the unnamed tributary

Qs = 100% of the 7-Q₂ of 0.01 cfs

Attachment #1

Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code

Qe = effluent flow rate = 1.5 MGD = 2.32 cfs

f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall equal the median of samples collected during the months of May through October.

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.152 mg/L from the Rubicon River at 18es13 (SWIMS ID 673230). The calculation of the median for background phosphorus calculations have changed since the previous permit reissuance per s. NR 102.07(1)(b), Wis. Adm. Code, so the background concentration is different for this evaluation although the same data is used.

Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration. In stream total phosphorus data upstream of the discharge is not available however the following data were considered in estimating the background phosphorus concentration:

SWIMS ID	673230	673131	673127
Station Name	Rubicon River - (18es13) Nwne	Rubicon River (Pike Lake Tributary) - Near Slinger WI	Rubicon River (Pike Lake Inlet) - Near Slinger WI
Waterbody	Rubicon River	Rubicon River	Rubicon River
Sample Count	4	6	109
First Sample	6/14/1995	5/17/1999	5/5/1999
Last Sample	10/31/1995	5/18/2000	10/29/2000
Mean	0.129	0.195	0.22193578
Median	0.135	0.1605	0.195

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

Limit Expression

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

Mass Limits

Attachment #1

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 or upstream of a phosphorus impaired water. **This final mass limit shall be $0.075 \text{ mg/L} \times 8.34 \times 1.5 \text{ MGD} = 0.94 \text{ lbs/day}$ expressed as a six-month average.** This is equal to the mass limit in the current permit.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 07/01/2021 – 07/31/2025.

Total Phosphorus Effluent Data – Outfall 001

	Concentration mg/L	Mass lbs/day
1-day P ₉₉	0.230	1.53
4-day P ₉₉	0.151	0.95
30-day P ₉₉	0.085	0.52
Mean*	0.056	0.33
Std	0.047	0.33
Sample size	965	965
Range	<0.038 - 0.775	0 - 5.62

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.

The WQBELs of 0.225 mg/L as a monthly average and 0.075 mg/L and 0.94 lbs/day as six-month averages became effective on 07/01/2021 and Slinger has been complying with it through water quality trading. **No changes are recommended for any phosphorus limits in the reissued permit.**

PART 5 – TOTAL SUSPENDED SOLIDS

The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) which shall be expressed as both weekly and monthly limits for a municipal facility. **Slinger is already complying with the TMDL limits for TSS and there are no changes from the current permit for the monthly or weekly WLAs.** The TMDL-based limits are shown in the table below:

TMDL-based TSS Limits

Month	Monthly TSS WLA ¹ (tons/month)	Monthly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)
January	3.49	225	317
February	3.49	249	351
March	3.49	225	317
April	3.50	233	329
May	3.49	225	317
June	3.50	233	329
July	3.49	225	317
August	3.49	225	317
September	3.50	233	329
October	3.49	225	317
November	3.50	233	329
December	3.49	225	317

Footnotes:

1. From the Rock River TMDL Appendix Q.

The table below summarizes effluent data from the current permit term, for informational purposes.

Total Suspended Solids Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P ₉₉	14.9	95.7
4-day P ₉₉	8.54	53.1
30-day P ₉₉	4.34	26.1
Mean*	2.49	14.4
Std	3.48	23.1
Sample size	966	966
Range	<2 – 50	0 – 362

*Results below the level of detection (LOD) were included as zeroes in calculation of the mean

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 °F. The 86 °F limit applies because the hydrologic classification is not listed as wetland or wastewater effluent channel in ch. NR 104, Wis. Adm. Code.

Reasonable Potential

Based on the available discharge temperature data from 11/01/2011 – 03/31/2013 shown below, the maximum daily effluent temperature reported was 73 °F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits or monitoring are recommended**.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	48	49	-	86
FEB	47	48	-	86
MAR	56	56	-	86

Attachment #1

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
APR	54	56	-	86
MAY	61	63	-	86
JUN	68	69	-	86
JUL	72	73	-	86
AUG	70	72	-	86
SEP	71	71	-	86
OCT	61	64	-	86
NOV	55	57	-	86
DEC	50	52	-	86

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (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 IC₂₅ (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 100%**, shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$\text{IWC (as \%)} = Q_e \div \{(1 - f) Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 1.5 MGD = 2.32 cfs

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = $\frac{1}{4}$ of the 7- Q_{10} = 0.01 cfs $\div$ 4 = 0.0025 cfs

Attachment #1

*The flow of the immediate receiving water (LFF classification) is used in this evaluation rather than the downstream flows at the WWSF classification. This is because the modeled natural community is cool-cold so the stream likely supports a full fish and aquatic life community.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
03/10/2009					>100	>100	Pass	Yes	
06/23/2009					>100	>100	Pass	Yes	
08/18/2009					>100	>100	Pass	Yes	
11/10/2009					>100	>100	Pass	Yes	
01/12/2010					>100	>100	Pass	Yes	
05/13/2010					>100	>100	Pass	Yes	
07/27/2010	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/26/2010					>100	>100	Pass	Yes	
07/21/2011	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
01/17/2012					>100	>100	Pass	Yes	
02/21/2012	35.4	>100	Fail	Yes					
03/27/2012	>100	>100	Pass	Yes					
05/08/2012	>100	>100	Pass	Yes					
07/27/2012	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/05/2014	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
12/03/2015	>100		Pass	Yes	>100	>100	Pass	Yes	
05/24/2016	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
01/31/2017	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/14/2018	>100	>100	Pass	Yes	10	>100	Fail	No	1
10/04/2018					>100		Pass	Yes	
09/12/2020	>100	>100	Pass	Yes		>100	Pass	Yes	
12/15/2020	>100	>100	Pass	Yes		>100	Pass	No	1

Attachment #1

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
01/19/2021					>100		Pass	Yes	
06/08/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/15/2022	>100	>100	Pass	Yes	90.3	>100	Fail	Yes	
04/05/2022					>100		Pass	Yes	
04/26/2022					>100	>100	Pass	Yes	
08/21/2023	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

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

$$\text{Acute Reasonable Potential} = [(TU_a \text{ effluent}) (B)(AMZ)]$$

$$\text{Chronic Reasonable Potential} = [(TU_c \text{ effluent}) (B)(IWC)]$$

$$\text{Acute Reasonable Potential} = [(TU_a \text{ effluent}) (B)(AMZ)]$$
Acute WET Limit Parameters

TU_a (maximum) 100/LC ₅₀	B (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4)
100/35.4 = 2.8	6.2 Based on 1 detect

$$[(TU_a \text{ effluent}) (B)] = 17.5 > 1.0$$

$$\text{Chronic Reasonable Potential} = [(TU_c \text{ effluent}) (B)(IWC)]$$
Chronic WET Limit Parameters

TU_c (maximum) 100/IC ₂₅	B (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/90.3 = 1.1	6.2 Based on 1 detect	100%

$$[(TU_c \text{ effluent}) (B)(IWC)] = 6.9 > 1.0$$

Attachment #1

Therefore, reasonable potential is shown for acute and chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 03/10/2009 – 08/21/2023.

Expression of WET limits

Acute WET limit = 1.0 TU_a (daily maximum)

Chronic WET limit = [100/IWC] TU_c = 1.0 TU_c expressed as a monthly average

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>.

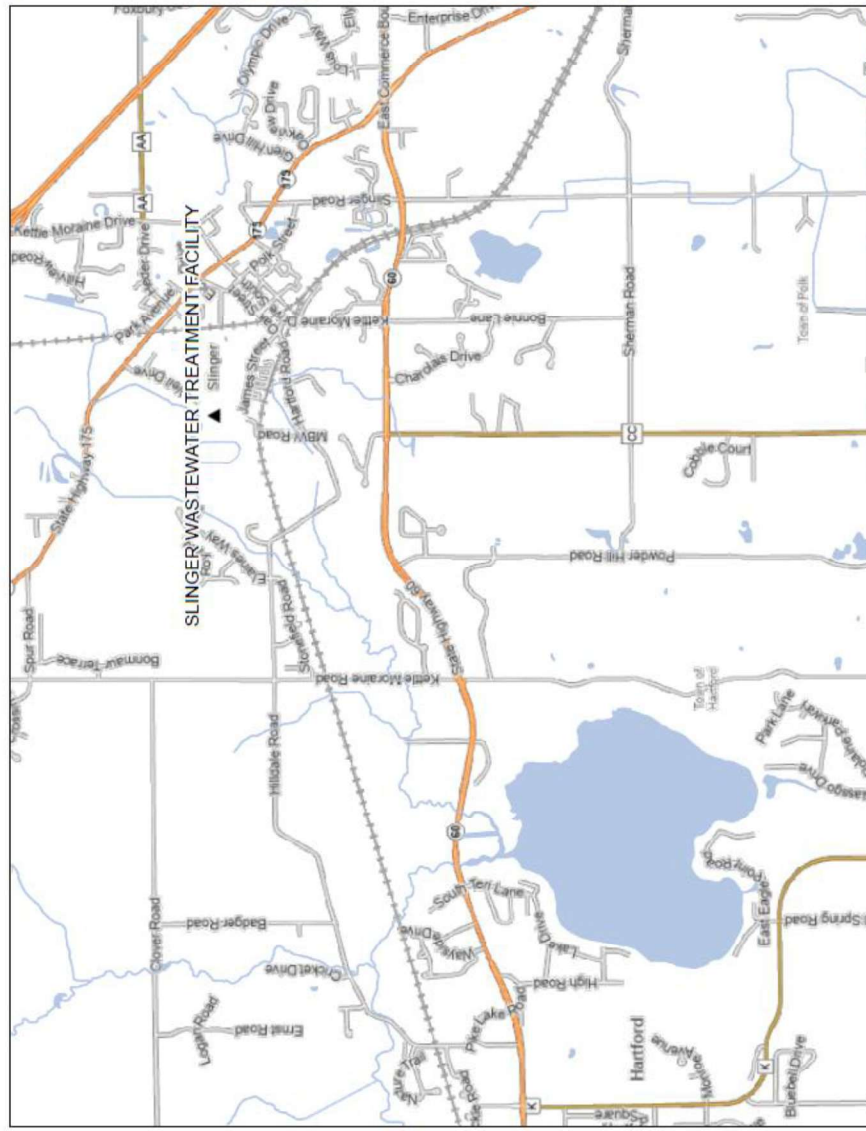
WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. 0 Points	IWC = 100%. 15 Points
Historical Data	16 tests used to calculate RP. 1 test failed. 0 Points	22 tests used to calculate RP. 1 test failed. 0 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as Acute. 0 Points
Receiving Water Classification	Direct discharge to an LAL classification - less than 4 miles to a WWSF classification. 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	Reasonable potential for limits for chloride based on ATC; Ammonia nitrogen limit carried over from the current permit. Mercury, ammonia and zinc detected. Additional Compounds of Concern: None. 8 Points	Reasonable potential for limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Mercury, ammonia and zinc detected. Additional Compounds of Concern: None. 8 Points
Additives	1 Water Quality Conditioner (Hyper Ion) added. Permittee has proper P chemical SOPs in place 1 Point	Additive is used more than once per 4 days. 1 Point
Discharge Category	0 Industrial Contributors. 0 Points	Same as Acute. 0 Points

Attachment #1

	Acute	Chronic
(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	29 Points
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
Limit Required?	Yes Limit = 1.0 TU _a	Yes Limit = 1.0 TU _c
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, annual acute and chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, acute and chronic WET limits are required. The acute WET limit shall be expressed as 1.0 TU_a as a daily maximum in the effluent limits table of the permit. The chronic WET limit shall be expressed as 1.0 TU_c as a monthly average in the effluent limits table of the permit.
- A minimum of annual acute and chronic monitoring is required because acute and chronic WET limits are required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Slinger is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.



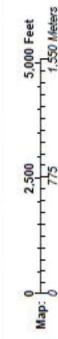
- Legend:** (Symbol map layers may not be displayed)
- ▲ Surface Water Outfalls
 - 24K Streams and Rivers
 - 24K Lakes and Open Water
 - Rivers and Streams
 - Intermittent Streams
 - Open Water
 - Latest Leaf Off Imagery**
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3

Notes:



Map projection: NAD 1983 HARN Wisconsin TM

Service Layer Credits:
Latest Leaf Off Imagery: Basic Basemap (Cached):



This map is a product generated by a DMR web mapping application.
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Date Printed: 9/8/2015 2:33 PM

Attachment #3
2008 Ammonia Calculations

Ammonia: Changes to NR 105, establishing updated criteria for ammonia, and NR 106, establishing procedures for determination of ammonia limits, were promulgated in February of 2004. NR 106.32(1)(b) also specifies that effluent limitations for ammonia shall be established, where possible, to protect downstream waters. Therefore, the limitations for the Slinger plant shall be determined for the warm water sport fishery segment of the Rubicon River, about ½ mile downstream of the discharge.

Overview of Ammonia Rule Changes: The changes to ch. NR 105 establish acute (daily) and chronic (weekly and monthly) criteria for ammonia in-stream, based on updated information on ammonia toxicity. Acute criteria are dependent on the classification of the receiving water and on the pH of the discharge. Chronic criteria are dependent on the classification, temperature and pH of the receiving water. In addition, the chronic criteria for most classifications of receiving water are dependent on the presence or absence of early life stages of fish. For fish species other than burbot, the presence of early life stages is assumed in April and when the average temperature is equal to or greater than 14.6 degrees Celsius. Burbot are known to reproduce in colder water beginning in January of the year. There have been a large number of surveys in the Southeastern Wisconsin river basins over the years, and no burbot have been found (communication with Sue Beyler, SER Fisheries Biologist). In addition, the Department's Master Fish file and Becker's Fishes of Wisconsin have no record of burbot in the Southeastern Wisconsin waters outside of Lake Michigan. Therefore the criteria for this tributary to the Rubicon River will not be determined to protect the early life stages of burbot.

The changes to ch. NR 106 establish procedures for determining effluent limitations. For acute (daily maximum) limits, the limit equals twice the acute criterion established in conformance with ch. NR 105, unless a zone of initial dilution has been approved for a discharger. The acute limit is dependent on the maximum effluent pH, which in this case is represented by the maximum of 8.0 s.u.

For chronic (weekly average) limits, the limit is a mass balance based on the average annual design flow of the plant and a percentage of the average minimum 7-day flow that occurs once every ten years (7Q10). The percentage of stream flow used is related to the temperature of the stream. When the geometric average of the stream temperature is less than 11 degrees C., 25% of the stream flow is used. When the geometric average stream temperature is equal to or less than 16 degrees C., 50% of the stream flow is used. When the geometric average stream temperature is greater than 16 degrees C., 100% of the stream flow is used. Since the rate of breakdown of ammonia increases with increasing temperature, a greater percentage of the stream flow can be used.

Based on the criteria in ch. NR 105, the procedures for limit determinations in ch. NR 106, and the effluent and stream data noted above, the proposed limitations for ammonia are:

Proposed Limitations for Ammonia	
Month(s)	Limitations
Year Round	17 mg/l, daily maximum
April	6.4 mg/l, weekly average; 2.6 mg/l, monthly average
May-September	2.6 mg/l, weekly average; 1.0 mg/l, monthly average
October	9.1 mg/l, weekly average; 3.6 mg/l, monthly average
November-March	10 mg/l, weekly average; 4.1 mg/l, monthly average

Attachment #3

In accordance with s. NR 106.32 (5), no mass limitations are recommended for ammonia.

Applicability of NR 207 (Antidegradation): For the months of October through April, the proposed weekly average limitations for ammonia are lower than those in Slinger's current permit. CH. NR 207 would apply if the new criteria and procedures were used, and if limits based on the increased plant design flow were greater than those for the current plant. Since the receiving water 7Q10 is very close to zero, the calculated ammonia limits for the design flow of 1.5 MGD are the same, or slightly lower than, the limits that would apply to the former design flow of 0.914 MGD. Therefore, a NR 207 review is not required

Facility Specific Chloride Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

A. Name of Permittee: Village of Slinger
 B. Facility Name: Slinger Wastewater Treatment Facility
 C. Submitted by: Wisconsin Department of Natural Resources
 D. State: Wisconsin Substance: Chloride Date completed: September 8, 2026
 E. Permit #: WI-0020290-11-0 WQSTS #: (EPA USE ONLY)
 F. Duration of Variance Start Date: January 1, 2027 End Date: December 31, 2031
 G. Date of Variance Application: July 14, 2025
 H. Is this permit a: ☐ First time submittal for variance
☒ Renewal of a previous submittal for variance (Complete Section IX)

I. Description of proposed variance: The Village of Slinger WWTF (Slinger) discharges to an unnamed tributary to the Rubicon River, in the Rubicon River Watershed in the Upper Rock River Basin, in Washington County. The proposed variance for chloride is from the water quality-based effluent limit (WQBEL) of 400 mg/L expressed as a weekly average. The proposed permit includes an interim limit of 555 mg/L (may – October) and 605 mg/L (November – April) expressed as a weekly average, a target value of 500 mg/L (weekly average), and the requirement to implement source reduction measures (SRMs). The term of the proposed variance is five years, concurrent with the term of the proposed WPDES permit. The underlying designated uses and criteria of Wisconsin's chloride water quality standards (WQS) will be retained, and all other applicable WQS will remain in effect with adoption of the proposed variance.

Citation: An interim chloride effluent limitation under s. NR 106.83(2), Wis. Adm. Code, represents a variance to water quality standards authorized by s. 283.15, Wis. Stats., and 40 CFR §131.14.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
BetsyJo Howe	betsyjo.howe@wisconsin.gov	608-419-4155	Permit Drafter/Variance Coordinator
Nicholas Lent	nicholas.lent@wisconsin.gov	414 897-5723	Compliance Staff
Nicole Krueger	nicole.krueger@wisconsin.gov	414-897-5750	Limit Calculator

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: 400 mg/L (chloride-chronic toxicity criteria)
 B. List other criteria likely to be affected by variance: None
 C. Source of Substance: Residential, commercial, and industrial water softener sources with I/I of road salt during the winter road maintenance season.
 D. Ambient Substance Concentration: 59.4 mg/L ☒ Measured ☐ Estimated
☐ Default ☐ Unknown
 E. If measured or estimated, what was the basis? Include citation. Background chloride data was collected from the tributary to the Rubicon River, 300 feet upstream of Slinger's outfall (09/19/1973-07/20/2006).
 F. Average effluent discharge rate: 1.5 MGD (annual average design flow) Maximum effluent discharge rate: 3.0 MGD (peak daily design flow)
 G. Effluent Substance Concentration: 1-day P99 = 756 mg/L ☒ Measured ☐ Estimated
 4-day P99 = 644 mg/L ☐ Default ☐ Unknown
 30-day P99 = 580 mg/L

H. If measured or estimated, what was the basis? Include Citation. Permit-required monitoring and effluent data from 10/01/2020 to 06/30/2025.	
I. Type of HAC:	☐ Type 1: HAC reflects waterbody/receiving water conditions ☐ Type 2: HAC reflects achievable effluent conditions ☒ Type 3: HAC reflects current effluent conditions
J. Statement of HAC: The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that the permittee implement its Chloride SRM plan. Thus, the HAC at commencement of this variance is 555 mg/L (May – October) and 605 mg/L (November – April), which reflects the greatest chloride reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Chloride SRM plan. The current effluent condition is reflective of on-site optimization measures that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for Slinger WWTF at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.	
K. Variance Limit: 555 mg/L for May – October and 605 mg/L for November – April as weekly averages	
L. Level currently achievable (LCA): 607 mg/L for May – October and 670 mg/L for November – April. These are the 4-day P99 values for the respective seasons from October 2020 to June 2025.	
M. What data were used to calculate the LCA, and how was the LCA derived? (<i>Immediate compliance with LCA is required.</i>) Data from the current permit term suggests the LCA has increased from the current variance limits as shown in K and L above. See below for basis of the variance limit.	
N. Explain the basis used to determine the variance limit (which must be $\leq$ LCA). Include citation. Typically, the 4-day P99 of effluent data is used as the variance interim limit. However, the calculated 4-day P99's for November – April and May – October from 2020 – 2025 are greater than the current variance limits for these time periods which were calculated based on older data. However, it would be counterproductive to increase the variance limit in the proposed permit, and the facility is usually in compliance with the existing interim limits, so they are retained in the proposed permit. With increased emphasis on source reduction measures and meeting the highest attainable condition, it is expected that Slinger will be able to more consistently comply with the current/proposed variance limits of 605 mg/L from November through April and 555 mg/L from May through October. Chapter NR 106, Subchapter VII, Wis. Adm. Code, allows for a variance; the imposition of a less restrictive interim limit; a compliance schedule that stresses source reduction and public education; and allowance for a target value or limit to be a goal for reduction.	
O. Select all factors applicable as the basis for the variance provided ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 under 40 CFR 131.10(g). Summarize justification below: The use of a reverse osmosis system was evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 5.81%. Installing centralized lime softening on the current municipal water supply system was also evaluated, and the estimated cost of doing so would be about 5.34% of the MHI. Without a variance, meeting the water quality standard of 400 mg/L would result in substantial and widespread economic and social impacts.	
Section III: Location Information	
A. Counties in which water quality is potentially impacted: <u>Washington</u>	
B. Receiving waterbody at discharge point: <u>Unnamed tributary to the Rubicon River</u>	
C. Flows into which stream/river? <u>Rubicon River</u> How many miles downstream? <u>0.5</u>	
D. Coordinates of discharge point (UTM or Lat/Long): <u>43.3352°N, -88.2976°W</u>	
E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection? <u>Approximately 2.5 miles</u>	

F. Provide the equation used to calculate that distance <i>(Include definitions of all variables, identify the values used for the clarification, and include citation):</i> The effluent is assumed to be 100% mixed with the receiving water by the time it reaches the Rubicon River approximately 0.5 miles downstream of the outfall. At this point, the concentration is about 524 mg/L for May – October and 570 mg/L for November – April ((effluent flow * interim limit) + (receiving water flow * background concentration)) / total flow. The ambient concentration in the Rubicon River is 68 mg/L (geomean of samples taken from 06/14/1995 to 10/31/1995 upstream of where the tributary meets the Rubicon River). The 7Q10 of the Rubicon is estimated to be 0.16 cfs. The streamflow of the Rubicon River increases at Hartford which is downstream of Pike Lake. Because of this, it is assumed that the dilution from Pike Lake will allow the criteria to be achieved there. This is approximately 2.5 miles downstream of the outfall.																
G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met? Limited Aquatic Life (LAL) community for the unnamed tributary (receiving water). The Rubicon River downstream of the confluence with the tributary is classified as a Warmwater Sport Fish (WWSF) community, approximately 0.5 miles downstream of Outfall 001. These waters are nonpublic water supply and recreational use.																
H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 20%;">Permit Number</th> <th style="width: 30%;">Facility Name</th> <th style="width: 30%;">Facility Location</th> <th style="width: 20%;">Variance Limit [mg/L]</th> </tr> </thead> <tbody> <tr> <td>WI-0020192-10-0</td> <td>Hartford Water Pollution Control Facility</td> <td>1600 Liberty Ave. Hartford, WI 53027</td> <td>570 mg/L</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Permit Number	Facility Name	Facility Location	Variance Limit [mg/L]	WI-0020192-10-0	Hartford Water Pollution Control Facility	1600 Liberty Ave. Hartford, WI 53027	570 mg/L								
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I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet See the “Slinger WWTF Variance Outfalls” map.																
J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list ☒ Yes ☐ No ☐ Unknown the impairments below. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 30%;">River Mile</th> <th style="width: 30%;">Pollutant</th> <th style="width: 40%;">Impairment</th> </tr> </thead> <tbody> <tr> <td>(Rubicon R.) 0 – 9.69; 11.43 – 29</td> <td>Total Phosphorus</td> <td>Low Dissolved Oxygen</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	River Mile	Pollutant	Impairment	(Rubicon R.) 0 – 9.69; 11.43 – 29	Total Phosphorus	Low Dissolved Oxygen										
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K. Please list any contributors to the POTW in the following categories: <i>May need to contact facility for this information</i> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tbody> <tr> <td style="width: 40%;">Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)</td> <td>N/A</td> </tr> <tr> <td>Metal Plating/Metal Finishing</td> <td>N/A</td> </tr> <tr> <td>Car Washes</td> <td>Kwik Trip</td> </tr> <tr> <td>Municipal Maintenance Sheds (salt storage, truck washing, etc.)</td> <td>Slinger DPW Garage, Washington County Shop</td> </tr> <tr> <td>Laundromats</td> <td>Village Laundry</td> </tr> <tr> <td>Other presumed commercial or industrial chloride contributors to the POTW</td> <td>Aurora Clinic</td> </tr> </tbody> </table>	Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)	N/A	Metal Plating/Metal Finishing	N/A	Car Washes	Kwik Trip	Municipal Maintenance Sheds (salt storage, truck washing, etc.)	Slinger DPW Garage, Washington County Shop	Laundromats	Village Laundry	Other presumed commercial or industrial chloride contributors to the POTW	Aurora Clinic				
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Car Washes	Kwik Trip															
Municipal Maintenance Sheds (salt storage, truck washing, etc.)	Slinger DPW Garage, Washington County Shop															
Laundromats	Village Laundry															
Other presumed commercial or industrial chloride contributors to the POTW	Aurora Clinic															

L. If the POTW does not have a DNR-approved pretreatment program, is a sewer use ordinance enacted to address the chloride contributions from the industrial and commercial users? If so, please describe. Yes, the sewer use ordinance for the Village of Slinger was amended in late 2019 to include provisions that allow the Village to require that users contributing chloride above 1000 mg/L or 25 lbs/day obtain a wastewater discharge permit. The ordinance was updated once again in 2022 to reduce the acceptable chloride concentration to 500 mg/L. The Village is still in the early / investigative stages of enforcing the ordinance.
Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)
A. Are there any industrial users contributing chloride to the POTW? If so, please list. N/A
B. Are all industrial users in compliance with local pretreatment limits for chloride? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc) N/A
C. When were local pretreatment limits for chloride last calculated? N/A
D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW N/A
Section V: Public Notice
A. Has a public notice been given for this proposed variance? ☒ Yes ☐ No
B. If yes, was a public hearing held as well? ☒ Yes ☐ No ☐ N/A
C. What type of notice was given? ☒ Notice of variance included in notice for permit ☐ Separate notice of variance
D. Date of public notice: September 15, 2026 Date of hearing: November 2, 2026
E. Were comments received from the public in regards to this notice or hearing? ☐ Yes ☐ No <i>(If yes, see notice of final determination)</i>
Section VI: Human Health
A. Is the receiving water designated as a Public Water Supply? ☐ Yes ☒ No
B. Applicable criteria affected by variance: No human health criteria for chloride
C. Identify any expected impacts that the variance may have upon human health, and include any citations: None
Section VII: Aquatic Life and Environmental Impact
A. Aquatic life use designation of receiving water: Limited Aquatic Life Warm Water Sport Fish is 0.5 miles downstream
B. Applicable criteria affected by variance: Chronic toxicity criteria for chloride = 395 mg/L from NR 105, Wis. Adm. Code, applicable in all Wisconsin waters.
C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations: The estimated concentration after mixing with ¼ of the 7Q10 is 554 mg/L for May – October and 604 mg/L for November – April. This concentration exceeds the genus mean chronic values for <i>Ceriodaphnia</i> (417 mg/L).
D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations: There are no Endangered or Threatened species known that would affect the water quality criterion, as the chronic toxicity criterion for chloride is more stringent than all genus mean chronic values for organisms with chloride toxicity data. As a result, no endangered species with data would need more protection than already provided by the existing criterion.

Citation: U.S. Fish & Wildlife Service – Environmental Conservation Online System (<http://www.fws.gov/endangered/>) and National Heritage Index (<http://dnr.wi.gov/topic/nhi/>)

Section VIII: Economic Impact and Feasibility

A. Describe the permittee's current pollutant control technology in the treatment process:

The Village of Slinger operates an activated sludge wastewater treatment facility that includes a mechanical bar screen, influent flow pumps, a grit removal system, a three-ring oxidation ditch, two clarifiers, and ultraviolet disinfection. The outer ring of the oxidation ditch is set for anoxic conditions for biological phosphorus removal. Polyaluminum chloride is added before clarification for additional phosphorus removal. The facility accepts hauled waste from domestic holding tanks and septic tanks. Waste activated sludge is gravity belt thickened and stored on-site prior to land application on Department approved sites.

B. What modifications would be necessary to comply with the current limits? Include any citations.

Upgrades to the WWTF to install reverse osmosis (RO) near the end of the current treatment process would be needed to comply with the QBEL of 400 mg/L.
Another option would be to upgrade the drinking water treatment plant by installing centralized or regional lime softening. This is not a practical alternative to comply with the QBEL due to excessive relative cost associated with centralizing well water from multiple wells or providing softening treatment at each well.

C. How long would it take to implement these changes?

A time determination was not completed due to the infeasibility of treatment for chlorides.

D. Estimate the capital cost (Citation): \$1,687,500 (WDNR Form 3400-193 Chloride Variance Application from permittee)

E. Estimate additional O & M cost (Citation): \$547,500 (WDNR Form 3400-193 Chloride Variance Application from permittee)

F. Estimate the impact of treatment on the effluent substance concentration, and include any citations:

A RO system at the WWTF could potentially remove chloride from the effluent to achieve levels below the water quality standard. However that concentrated waste would still have to be disposed of somewhere. An upgraded lime softening system would eliminate the need for ion exchange softeners and the associated chloride brine generated during the regeneration/backwash cycle that is ultimately discharged to the wastewater treatment system. However, neither option is considered to be economically feasible.

G. Identify any expected environmental impacts that would result from further treatment, and include any citations:

End-of-pipe RO wastewater treatment technology for chloride produces concentrated brine that can be as much or more of an environmental liability than the untreated effluent. Since the concentrated brine cannot be further treated, the only recourse for the disposal of the brine is transfer to another community, which is often not feasible. Appropriate chloride source reduction activities are preferable environmentally to effluent end-of-pipe treatment in most cases, since the end product of treatment (production of a concentrated brine) does not remove the load of chloride from the environment.

There would be some impacts based on disposal of brine from RO. These include air pollution impacts from trucking brine and increased chloride impacts at the point where brine is discharged.

H. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? ☐ Yes ☒ No ☐ Unknown

RO treatment of the Slinger WWTF effluent to meet the QBEL is technically feasible. However, it is not economically feasible. See WDNR Variance Application and Municipal RO Screening Tool for costs of RO. Use of RO was evaluated. The resulting total cost for sewer user rates was estimated to result in an average cost to households that would be 5.81% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.
Lime softening treatment of Slinger's water supply, in lieu of ion-exchange, is technically feasible and would potentially enable the WWTF effluent to meet the chloride QBEL. However, lime softening is not economically feasible. See the Chloride Variance Economic Eligibility Tool (Lime Softening) for costs of lime softening. Use of municipal lime softening was evaluated; the resulting cost for sewer user rates was estimated to result in an average cost to households that would be 5.34% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.

I. If treatment is possible, is it possible to comply with the limits on the substance?	☒ Yes ☐ No ☐ Unknown
J. If yes, what prevents this from being done? Include any citations. See Section VIII:H. The costs associated with RO and lime softening treatment are prohibitively expensive.	
K. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations: Drafter Reverse Osmosis (RO) Treatment – not economically feasible (5.81% of the MHI) Centralized Lime Softening Treatment – not economically feasible (5.34% of the MHI)	
Section IX: Compliance with Water Quality Standards	
A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations. During the previous permit term, the Village of Slinger's permit included the following SRMs: 1. Continue written and in-person education program for all sanitary sewer users in the Village, including information booth at Washington County Fair 2. Develop and conduct residential water softener survey 3. Implement chloride limits in recently amended sewer use ordinance to address commercial, industrial and institutional sources 4. Research and evaluate feasibility of ordinance update to address hard-water bypass to outdoor hose bibs 5. Research and evaluate feasibility of ordinance update to include a surcharge for users that exceed chloride ordinance limit 6. Research and evaluate feasibility of a Village program to incentivize tune ups or upgrade of water softeners in residential area tributary to the WWTF 7. Continue to monitor/evaluate significant sewer users including residential, commercial, industrial, and institutional sources 8. Initiate contact with key industries identified during monitoring 9. Initiate contact with key commercial facilities identified during monitoring and inspect 10. Continue to work with the Slinger School District to optimize water softener usage and reduce chloride loading at the high school and middle school, including ongoing maintenance supervision 11. Consider using the school district sites as a pilot for high-efficiency water softener implementation and hard water bypass system 12. Provide updated on replacement of Well No. 4 with Well No. 7 as it relates to reduction of chloride in the water supply 13. Continue discussion with Washington County Highway Department regarding source water reduction efforts at the storage facility including a was water diversion system 14. Continue best management practices for salt application in the Village including truck calibration, pre-wetting key routes, and driver education 15. Complete construction of the Slinger DPW garage vehicle wash water diversion system and develop standard operating procedures for wash water end use or disposal 16. Continue efforts to find and reduce inflow and infiltration to the collection system per CMOM goals 17. Consider feasibility of hauled waste chloride limits 18. Optimize the use of the current phosphorus treatment additive that results in the lowest level of residual chlorides leaving the plant 19. Investigate the feasibility of switching to alternative phosphorus treatment additive(s) that provide the same amount of treatment but result in lower levels of residual chlorides leaving the plant Citation: Slinger Wastewater Treatment Facility Chloride Annual SRM Reports 2021-2025	
B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.	

As conditions of this variance the permittee is required to (a) maintain effluent quality at or below the interim effluent limitation in the proposed permit, (b) implement the chloride source reduction measures specified in the Chloride Source Reduction Measures (SRM) Plan dated 7/20/2026, and (c) perform the actions listed in the Schedule section of the proposed permit.

Citation: Slinger Wastewater Treatment Facility Source Reduction Measures Plan dated 7/20/2026

Section X: Compliance with Previous Permit (*Variance Reissuances Only*)

A. Date of previous submittal: August 10, 2020 **Date of EPA Approval:** September 25, 2020
B. Previous Permit #: Wi-0020290-10-0 **Previous WQSTS #:** (EPA USE ONLY)
C. Effluent substance concentration: 644 mg/L (4-day P99) **Variance Limit:** 555 mg/L (May – October, weekly average), 605 mg/L (November – April, weekly average)
D. Target Value(s): 500 mg/L (weekly average) **Achieved?** ☐ Yes ☒ No ☐ Partial

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Continue written and in-person education program for all sanitary sewer users in the Village, including information booth at Washington County Fair	☒ Yes ☐ No
Develop and conduct residential water softener survey	☒ Yes ☐ No
Implement chloride limits in recently amended sewer use ordinance to address commercial, industrial and institutional sources	☒ Yes ☐ No
Research and evaluate feasibility of ordinance update to address hard-water bypass to outdoor hose bibs	☐ Yes ☒ No
Research and evaluate feasibility of ordinance update to include a surcharge for users that exceed chloride ordinance limit	☒ Yes ☐ No
Research and evaluate feasibility of a Village program to incentivize tune ups or upgrade of water softeners in residential area tributary to the WWTF	☒ Yes ☐ No
Continue to monitor/evaluate significant sewer users including residential, commercial, industrial, and institutional sources	☒ Yes ☐ No
Initiate contact with key industries identified during monitoring	☒ Yes ☐ No
Initiate contact with key commercial facilities identified during monitoring and inspect	☒ Yes ☐ No
Continue to work with the Slinger School District to optimize water softener usage and reduce chloride loading at the high school and middle school, including ongoing maintenance supervision	☒ Yes ☐ No

Consider using the school district sites as a pilot for high-efficiency water softener implementation and hard water bypass system	☒ Yes ☐ No
Provide updated information on replacement of Well No. 4 with Well No. 7 as it relates to reduction of chloride in the water supply	☒ Yes ☐ No
Continue discussion with Washington County Highway Department regarding source water reduction efforts at the storage facility including a wash water diversion system	☒ Yes ☐ No
Continue best management practices for salt application in the Village including truck calibration, pre-wetting key routes, and driver education	☒ Yes ☐ No
Complete construction of the Slinger DPW garage vehicle wash water diversion system and develop standard operating procedures for wash water end use or disposal	☒ Yes ☐ No
Continue efforts to find and reduce inflow and infiltration to the collection system per CMOM goals	☒ Yes ☐ No
Consider feasibility of hauled waste chloride limits	☒ Yes ☐ No
Optimize the use of the current phosphorus treatment additive that results in the lowest level of residual chlorides leaving the plant	☒ Yes ☐ No
Investigate the feasibility of switching to alternative phosphorus treatment additive(s) that provide the same amount of treatment but result in lower levels of residual chlorides leaving the plant	☒ Yes ☐ No

**SLINGER WASTEWATER TREATMENT FACILITY
SOURCE REDUCTION MEASURES/POLLUTANT MINIMIZATION
PROGRAM PLAN
WI-0020290-11-0**

**VILLAGE OF SLINGER
WASHINGTON COUNTY, WISCONSIN
JULY 20TH, 2026**

NARRATIVE

This Village of Slinger was issued its current WPDES Permit No. WI-0020290-10-0 effective October 1, 2020. This permit contained a variance in accordance with NR 106.83(2) of the Wisconsin Administrative Code, which allows the Village to maintain effluent chloride levels below interim limits (605 mg/L, November-April; and 555 mg/L May-October) while implementing source reduction measures. This document is intended to act as an updated Source Reduction Measures (SRM) Plan for the upcoming permit WPDES Permit No. WI-0020290-11, where a renewal of the existing variance is requested.

Over the last permit cycle, the Village has taken significant steps to address an array of sources of elevated chlorides in its wastewater. Significant capital improvements to the brine recycling system and the construction of new municipal well, Well 7, were all accomplished by the municipality and made up the majority of the spending on chloride mitigation. The brine system both captures washdown salt from the municipal garage and provides a potent brine for winter roadway application that is more effective and ultimately introduces less chlorides into the environment. The new well has a significantly lower chloride concentration and has replaced a third of the production of all other wells since being put online in January 2026. There are also several residential programs that the Village has undertaken; the AMI metering has automatic leak detection that would help reduce total softened water use by preventing unnecessary losses, and the secondary hose bib meter program has also been expanded on. The hose bib meter is intended to bypass water softeners for exterior water use that wouldn't require as soft water. The AMI meter program adoption has been completed, and the Village hopes to continue expanding the hose bib meter program now that their previous program has been completed.

In the next permit cycle, previous recurring actions will still be continued (see SRM plan table later in report), but new targeted action is planned for the next permit cycle. Previous monitoring of industrial sources identified the Fresenius Clinic as a major chloride source for wastewater. They were approximately 3 times the level typically allowed under ordinance. The clinic is a dialysis clinic that requires pure water for treatment, but the Village has expressed an interest in reviewing the specific plumbing of their system and looking at improvements to reduce the loading. There was some discussion of diverting some portion of the wastewater into a concentrate that can be utilized for brine for winter road salting. The Village is additionally looking to renew efforts to advocate for higher efficiency water softeners and expanding secondary metering (as mentioned above). The Village will also be more intentional in coordinating with other commercial business owners that are not subject to the same level of monitoring that industrial sources are.

SOURCE IDENTIFICATION / MASS BALANCE

There is limited information to analyze the mass balance and sources of chlorides in the system. Only industrial sources, well data, hauling, road deicing and effluent data are regularly captured by the Village. There are several other sources that could be analyzed to further identify areas of concern. Currently, it is known that approximately 500 pounds of chlorides are added to the system each day from the municipal wells. This is the 6-month average since Well 7 had come online. This has a background concentration of 135 mg/L. When correcting for the use of municipal water in the industrial operations, the average industrial loading is believed to be 148 pounds per day. Hauled waste contributed 426 pounds per day over the same six month period. Over that period the effluent was roughly 3650 pounds per day into the environment.

Differentiating between commercial and residential contributions is difficult, as all are likely to have water softeners of varying efficiencies and ages. For the time being this can be considered the same flows, although survey of commercial properties would be an option if necessary. Interventions would likely not be different in any case, as new high-efficiency water softeners are required when the old water softeners are no longer operable.

The Village does not collect plant influent concentrations, as they anticipate the influent being equal to the effluent minus the chemical added for phosphorus (believed to be 50 mg/L typically). Monitoring could be done to establish a biosolids retention portion. Inflow and Infiltration analysis would also need to be done to determine an approximate contribution from road deicing practices.

PLANNED ACTIONS

The Village compiled a list of specific chloride source reduction measures to address in its current WPDES permit. These source reduction measures guided the Village's actions over the past several years. The following section reviews the Village's progress on addressing these items to reduce chlorides sources in the service area. The text is written to summarize the results of the SRMs throughout the most recent permit cycle.

These SRMs are categorized into three general categories; education, monitoring, and housekeeping.

Education

The education section outlines the Village's public outreach and educational initiatives intended to increase awareness of chloride sources and promote practices that reduce chloride loading to the wastewater treatment system and receiving waters.

1. The first source reduction measure relates to educating sanitary sewer users about water softener usage and chloride reduction strategies. Village staff along with other surrounding communities set up a clean water educational booth at the 2025 Washington County Fair. The booth contained educational materials and handouts that pertain to chloride reduction and clean drinking water. At the booth, the Village handed out salt-wise cups showing the suggested amount of salt to apply to 10 ft² of sidewalk area for deicing. According to Village staff the booth was well attended. In addition to the educational booth, in 2022 the Village added information to its website about control of salt and chlorides in areas regarding water and stormwater. The website also has links to the Wisconsin Salt Wise webpages. There have also been public outreach conducted for reducing chlorine output from home water softeners, through replacing low-efficiency with new high-efficiency softeners or "on-demand" softeners. There are marketing materials included in Appendix X for reference.



2. The Village has been in contact with the Washington County Highway Department and found that brine deicing would reduce chlorides as well as be more effective for the treatment of roads. The Village DPW previously proposed a replacement of their salt brine application system with a more effective updated system. This is a continuing conversation in the Village.
3. The Village has implemented a voluntary "sprinkler meter program" where property owners are able to install a secondary water meter for outside hard water use. This ensures that the water discharged for outside use is not being softened. This project has been done in conjunction with the Village upgrading to AMI-capable water meters. The Village has about % of its water customers changed over to the new meter. 56 homes have a secondary hose bib meter. This is a volunteer program, and the Village believes it will continue to grow as word gets out about it.

Monitoring

The monitoring section outlines the measures implemented to track chloride contributions from businesses and other sources, monitor environmental conditions, and evaluate progress toward chloride reduction goals.

4. The Village continues to monitor key commercial, industrial, and institutional sites directly tributary to the Village sanitary sewer collection system monthly. Additional sites significant sewer users will be investigated as necessary. Based on results to date, the Village identified a handful of commercial/industrial facilities tributary to the sanitary sewer system in 2022 that were targeted for chlorides reductions. Kwik Trip saw chloride levels decreased in 2023.
5. The Village continues outreach efforts with key industrial users identified through chloride monitoring and sampling activities. The Village maintains communication with these facilities to discuss chloride sources, operational practices, and potential opportunities for reduction. Monthly chloride testing results are reviewed to identify significant contributors and track trends over time. The Village will continue working with the largest contributors identified during monitoring to encourage best management practices and evaluate feasible measures that may reduce chloride discharges to the wastewater collection system. This ongoing collaboration provides the Village with valuable information regarding industrial chloride sources and supports its long-term chloride reduction goals.
6. The Village continues outreach and inspection efforts with key commercial facilities identified through chloride monitoring and sampling activities. Commercial establishments, including pubs, restaurants, laundromats, and carwash facilities, have been targeted for inspections and sampling to better understand operational practices and equipment that may contribute chlorides to the wastewater collection system. Businesses are sampled for phosphorus and chloride concentrations to identify significant contributors and evaluate actual discharge levels. The Village prioritizes monitoring of the largest commercial users to maximize the impact of chloride reduction efforts and regularly discusses chloride sources, best management practices, and opportunities for source reduction. The Village has also evaluated the potential for an incentive program to encourage replacement of older, less efficient water softeners with high-efficiency units, although this program has not been implemented. The Village will continue these inspections, monitoring efforts, and business outreach activities as part of its chloride management strategy.
7. In 2022, the Village updated its chlorides discharge permit for commercial, industrial, and institutional entities that discharge to the Slinger WWTF. A limit of 1000 mg/L has been implemented in the updated ordinance. In addition, the Slinger WWTF has begun education programs. The education programs apply to the board and user education programs. Also, the WWTF has been meeting with industrial users to try and educate and find methods to decrease the number of chlorides. A list of industrial users that have been contacted is attached as an appendix.
8. The Village has identified the Fresenius Clinic as an industrial source that has exceeded the implemented ordinance regularly. The Clinic uses dialysis for treatment that requires purified water, and it is believed the high chlorides is a concentrated reject water from the clinics filters. The Village has operated under the belief that this was unavoidable for the service provided, but are now looking to verify that the system is operating in a responsible manner. One of the options the Village was looking to explore was for Fresenius to have a holding tank on site for concentrated reject, and potentially utilize it as a brine source for roadway application. This permit cycle will serve as an exploratory cycle to see what is possible to address.

9. The Village continues to monitor chloride levels in hauled waste and has maintained strong coordination with waste haulers to track chloride contributions from individual customers. Testing has been completed regularly to identify high-chloride sources to target with source reduction. The Village had explored reducing hauled waste generally to 10% of daily flows as a way to reduce chloride loading. However, this reduction did not translate to a significant reduction in elevated chloride levels in effluent. The Village is working on determining what their hauled waste strategy will be, but does have a 1000 mg/L limit for chloride concentration from hauled waste per Village ordinance.
10. The Village has expanded its chloride monitoring to monitor two points along the Rubicon River, the tributary the WWTF discharges to, in order to monitor the impacts of its effluent. There is one location 210' upstream of the plant discharge.
11. The Village has been working with Slinger School Districts to verify that proper maintenance is done annually on the new high-efficiency water softeners used at the middle and high schools. This is aimed to keeping the efficiency high at one of the larger water users in the Village.

Housekeeping

The housekeeping section outlines the actions undertaken by Village departments to improve internal chloride management practices and reduce chloride contributions from municipal operations.

12. The Village has recently completed the construction on a new municipal well, Well 7, to reduce reliance on Well 4. The initial chloride concentrations from Well 7 is significantly lower than those of Well 4. The Village has shifted their water supply sources to being 33% from Well 7 and reducing all other wells (Well 3, 4, and 5) by 30% each. This has decreased the chloride levels from the water supply system in general by approximately 30%. Chloride concentrations are still monitored and reported for each well, as well as their monthly totals.
13. The Village continues to work with the Washington County Highway Department to identify chloride source reduction opportunities and implement best management practices. Through this collaboration, the County has taken several steps to reduce chloride discharge, including calibrating salt trucks, implementing runoff control measures. Hauled waste does not seem to be impacting the elevated chloride levels. Ordinance has a limit of 500 (Greg will review), sealing manholes to reduce I/I, and incorporating auger systems on new salt trucks. The County has also adopted brine-only routes within the Village and continues to evaluate additional salt application improvements. The Village has discussed upgrading its own brine application system and has explored other collaborative initiatives with the County, such as a shared detention pond and wash water diversion system. These efforts remain an ongoing focus as both parties continue to pursue effective chloride reduction strategies.
14. The Slinger DPW continues to conduct a salt application best practices program for their DPW staff to educate salt truck drivers every year. Drivers are instructed on how much salt to apply per lane mile and how to prewet the salt to make a brine solution. The Village uses dedicated brine trucks and applies 300 lbs. of salt per lane mile. The Village purchased a dedicated brine-making system in 2023, which was delivered in 2024. A picture of this system is below.



15. The Slinger DPW garage has completed upgrades to their facility. Included with the upgrade was a new carwash system that will minimize chlorides input into the sanitary sewer system by diverting wash water in a brine tank. The disposal or reuse of this water will have a significant impact on the amount of salt discharged to the sanitary sewer from the Village garage. The Village will continue inspection of current plowing equipment to identify ways in which mechanical removal efficiency can be increased. The DPW has also continued efforts to calibrate their salt trucks and ongoing training efforts have been emphasized. Training includes salt application best practices including pre-wetting, well-timed salt applications, and level of service determination. The Village also has upgraded plows with new plow blades that clear roads more effectively, improving the brine's performance. Recently purchased weather stations are also utilized to determine the actual site conditions and are used to determine when treatment of roads is necessary.
16. Village has continued efforts to reduce inflow and infiltration (I/I) through system inspection, maintenance, and infrastructure improvements. An extensive manhole inspection program identified covers with open pick holes and vented covers for replacement, and repairs to leaks along James Street and Lous Way have resulted in measurable reductions in I/I at the WWTF. In addition, the Village completed plans and design for the W. Washington Street Sewer Relay project in 2023, with construction awarded in 2024 and scheduled to begin in spring 2025. The project will replace aging clay sewer and manholes with new PVC sewer and structures, eliminating approximately 965 feet of old 8-inch clay sewer and four manholes, replacing an additional 1,220 feet of clay sewer, and installing five new manholes. These improvements are expected to further reduce I/I within the collection system.
17. In 2023, the Slinger WWTF staff continued the use of phosphorus removal treatment additives used to reduce effluent chloride levels. The phosphorus removal treatment additive used was Qwik-Zyme L Degreaser from Aquafix, Inc. The primary chemical treatment is poly-aluminum chloride (PAC) sourced from Chemtrade, HI 4107. In August, the Village jar tested HI-3883 from Chemtrade. It has a 21.5% chloride level compared to our HI-4107 at 21% but the Village wanted to explore the possibility of needing to add less volume of the chemical product. As it turned out, more of the new product would have been needed so the Village abandoned the idea of switching. The Village continues to use the HI 4107 product. The Village plans to reduce the dosage by approximately 5% to help reduce the effluent chloride concentration. The Village Water Quality Trading program which provides phosphorus credits to offset higher effluent phosphorus concentrations, will allow them to reduce the HI 4107 dosage.

There were a few items that are notable that are not a SRM, but relevant information to understand the total history of chloride reduction:

- The Village investigated potential chloride reduction technologies that could be implemented at the WWTF. The Village considered one such technology, the BioLargo Aqueous Electrostatic Concentrator or AEC, in 2024. This technology is designed to remove PFAS from water but has also been shown to remove chlorides in case studies. The Village learned that the capital cost was extremely expensive from working with their engineering consultant. The Village is no longer considering this technology.
- The Village had a program incentivizing its homeowners to install high efficiency water softeners. With the program the Village would reimburse the homeowner or licensed plumber upon receiving a receipt for the purchase of the softener equipment. This program ended due to budgetary constraints, and as other capital improvement purchases were being pursued. There is a possibility that this program could return in the future now that Well 7 and brine equipment have been purchased.

Table 1. Source Reduction Measure Plan Implementation Schedule

**Village of Slinger Chloride Source Reduction Measures (SRM) Plan
2027-2032**

<u>Number</u>	<u>Status</u>	<u>SRM EDUCATION</u>	<u>AUDIENCE</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>ANTICIPATED OUTCOME</u>
1	EXISTING	Continue written and in-person education program for all sanitary sewer users in the Village, including information booth at Washington County Fair and National Night Out. Written education includes maintaining chloride reduction information on the Village's website	Residents	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce discharge of chlorides from water softeners
2	EXISTING	Monitor implemented chloride limits in amended sewer use ordinance to address commercial and industrial sources	Commercial & Industrial	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering system
3	NEW	Expand hard water bypass incentive program. Homeowners have the opportunity to decrease sewer bill with non-softened water use (separately metered and not counted toward sewer charge) and implement and expansion of leak detection system	Residents & Commercial	Market program to residents as cost savings measure	Market program to residents as cost savings measure	Market program to residents as cost savings measure	Market program to residents as cost savings measure	Market program to residents as cost savings measure	Reduce softened water production for residential use not requiring soft water

**Village of Slinger Chloride Source Reduction Measures (SRM) Plan
2027-2032**

<u>Number</u>	<u>Status</u>	<u>SRM MONITORING</u>	<u>AUDIENCE</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>ANTICIPATED OUTCOME</u>
4	EXISTING	Continue to monitor/evaluate significant sewer users including commercial, industrial, and institutional sources	Commercial & Industrial	Ongoing Monitoring	Ongoing Monitoring	Ongoing Monitoring	Ongoing Monitoring	Ongoing Monitoring	Identify potential trends and sources
5	EXISTING	Continue contact with key industries identified during monitoring, determined by monthly chloride testing	Industrial	Contact Key Industries	Contact Key Industries	Contact Key Industries	Contact Key Industries	Contact Key Industries	Work with largest contributors identified during previous monitoring
6	EXISTING	Continue contact with key commercial facilities identified during monitoring and inspection, determined by monthly chloride testing. While encouraging existing commercial facilities to use high efficiency commercial water softeners and appliances	Commercial	Inspect 3 commercial facilities	Inspect 3 commercial facilities	Inspect 3 commercial facilities	Inspect 3 commercial facilities	Inspect 3 commercial facilities	Work with largest contributors identified during previous monitoring
7	EXISTING	Continue monitoring and communication with industrial chloride sources on reduction and keeping chlorides within the general industrial permit requirement of 1000 mg/L.	Commercial	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Keep industrial sources within general permitting requirements

**Village of Slinger Chloride Source Reduction Measures (SRM) Plan
2027-2032**

<u>Number</u>	<u>Status</u>	<u>SRM MONITORING</u>	<u>AUDIENCE</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>ANTICIPATED OUTCOME</u>
8	NFW	Review system at Fresenius Clinic to determine if improvements can be made. Evaluate strategies to lower chlorides contribution.	Industrial	Meet with clinic staff and review their system. Evaluate plumbing changes that can be made	Monitoring and review additional improvements as required	Monitoring and review additional improvements as required	Monitoring and review additional improvements as required	Monitoring and review additional improvements as required	Reduce the discharge from the clinic to within the standard industrial permit allowance
9	EXISTING	Continue ongoing monitoring of chloride levels in daily hauled waste loads at WWTF, while limiting the amount of hauled waste accepted	Village Staff	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering system
10	NEW	Monitor of chloride levels in tributary to Rubicon at 210' upstream, and 3,195' downstream of plant outfall	Village Staff	Ongoing, monthly	Ongoing, monthly	Ongoing, monthly	Ongoing, monthly	Ongoing, monthly	Better understanding of impact on river water quality
11	EXISTING	Continue ongoing maintenance supervision for Slinger School District at High School and Middle School following installation of a new high efficiency water softener	Commercial	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce discharge of chlorides from water softeners

**Village of Slinger Chloride Source Reduction Measures (SRM) Plan
2027-2032**

<u>Number</u>	<u>Status</u>	<u>SRM HOUSEKEEPING</u>	<u>AUDIENCE</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>ANTICIPATED OUTCOME</u>
12	EXISTING	Provide updates in annual water report on chloride levels from system wells as Well No. 7 is brought online. The Village can adjust their source water percentages as needed after more data is available.	Village Staff	Monitor chloride levels by well	Adjust system source composition as necessary	Adjust system source composition as necessary	Adjust system source composition as necessary	Adjust system source composition as necessary	Reduces chloride concentration in water source
13	EXISTING	Continue best management practices with Washington County Highway Department regarding source water reduction efforts at the storage facility including a vehicle wash water diversion system similar to the system at the Village DPW garage	Village Staff	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering system through vehicle wash water

**Village of Slinger Chloride Source Reduction Measures (SRM) Plan
2027-2032**

<u>Number</u>	<u>Status</u>	<u>SRM HOUSEKEEPING</u>	<u>AUDIENCE</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>	<u>ANTICIPATED OUTCOME</u>
14	EXISTING	Continue best management practices for salt application in the Village including truck calibration, pre-wetting key routes, and driver education	Village Staff	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering system through I&I
15	EXISTING	Monitor and maintain Slinger DPW vehicle wash water diversion system and adjust standard operating procedures for wash water end use or disposal as needed	Village Staff	Monitor/ maintain as needed	Monitor/ maintain as needed	Monitor/maintain as needed	Monitor/ maintain as needed	Monitor/ maintain as needed	Reduce chlorides entering system through vehicle wash water during winter months
16	EXISTING	Continue efforts to find and reduce inflow and infiltration (I&I) to the collection system per CMOM goals	Village Staff	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering system through I&I
17	EXISTING	Optimize the use of the current phosphorus treatment additive that results in the lowest level of residual chlorides leaving the wastewater treatment facility	Village Staff	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Reduce chlorides entering the facility

APPENDIX

Sprinkler Meters...Save Money and Help the Environment!

For those who water their garden a lot, it may be beneficial to have an additional meter rental charge. These are typically known as sprinkler meters and once installed, any water going through this meter will not receive any sewer charges. In addition to saving on the sewer charges, you will also be cutting down on the amount of water that needs to be softened. This saves you money on salt and cuts down on the number of times a softener has to recharge. Less salty water going down the floor drains is less salt that ends up in the environment and our lakes and streams! [Click here to view the rates](#). For more details on how to get this process started, please contact the Utilities Superintendent, Greg Moser, at gmoser@vi.slinger.wi.gov.

Slinger's Badger Smart Water Meters

A smart water meter is an advanced metering infrastructure with an easy-to-read, high-resolution LCD display with data and alarms you are able to view and track using the EyeOnWater website and app.

As opposed to conventional read only meter in which users get the information on water usage months after the events occurred, a smart metering system can provide real-time water consumption. It provides continuous and historical data, while improving system intelligence, visibility, automation, and control to help water utilities optimize all areas of their water network.

Follow these instructions to create an account on EyeOnWater:

1. Visit <https://eyeonwater.com/signup> on your computer using a supported web browser or download the EyeOnWater app from your app store.
2. Enter your mailing address zip code.
3. For your account number, enter in your account number without any extra zeros. The dash should be included. Ex. Account # on utility bill 12345-00 Account # for eyeonwater 12345-0.
4. Enter your email address.
5. Create and confirm a password.
6. You will get a confirmation email from BEACON. You must verify your email address by clicking on the link.
7. Once you receive the confirmation email, you can sign in using your email and password.

If you're having difficulties, please contact the Village at 262-644-5265.

Figure 1. Marketing Material for the Badger Smart Water Meters. See SRM #3 on the SRM Plan.

Be Salt Wise!

Safe winter driving is as easy as 1-2-3:



1. Wait

Wait to allow time for plowing and deicers.



2. Know

Know the current road conditions before you hit the road.



3. Slow

Travel slowly, and use caution and reason.

WI Salt Wise Partnership



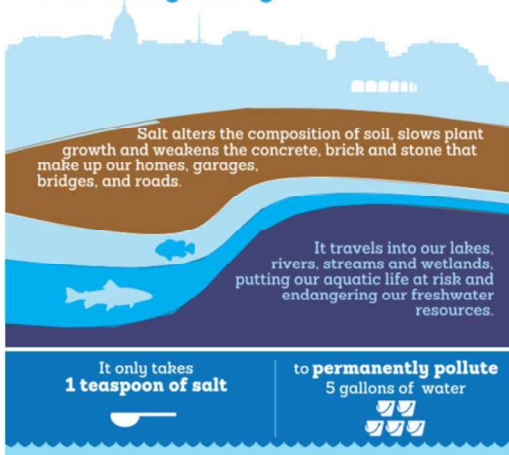
Follow WI Salt Wise on:



www.wisaltwise.com

Reduce your winter salt use to help protect our lakes, streams and drinking water.

Once you put salt down, it doesn't go away



Every year, we use about...



... of salt on our roads

This doesn't include what we use on sidewalks, driveways, and parking lots.

Reduce your salt use to help protect our lakes, streams, and drinking water.

1. Shovel



Clear walkways and other areas before the snow turns to ice. The more snow you remove manually, the less salt you will have to use and the more effective it will be.

2. Scatter



If you use salt, scatter it so that there is space between the grains. Believe it or not, a coffee mug of salt is enough to treat an entire 20-foot driveway or 10 sidewalk squares.

3. Switch



When pavement temperatures drop below 15 degrees, salt won't work. Switch to sand for traction or a different ice melter that works at lower temperatures.

4. Select a Certified Applicator



Encourage your maintenance professional to get certified through the City of Madison's Winter Salt Certification Program and ask businesses in your community to do the same.

5. Love the Lines



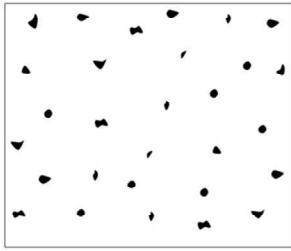
Stripes on roads before a storm are anti-icing. They show that your professional maintenance crew is concerned about safety and is saving money, time and protecting our environment!

6. Be Salt Wise All Year



Water softener salt ends up in local freshwater bodies. If your household softener uses more than 1 bag of salt per month, have a professional tune it up or replace it with a high-efficiency model.

After shoveling, scatter salt
leaving space between grains:



The salt in this cup is enough
to treat a 20-foot driveway
or 10 sidewalk squares.

Be Salt Wise!

Reduce your winter salt use to
help protect our lakes, streams
and drinking water.

Learn more at
www.wisaltwise.com

Figure 2. Marketing Material for Salt Use. See SRM #1 on the SRM Plan.



June 3, 2026

Jim Haggerty, Engineer and Director of Public Works
Village of Slinger, WI
[via email only]

SUBJECT: Slinger Wastewater Treatment Facility - WPDES Permit No: WI-0020290
Water Quality Trading Plan – Conditional Approval

The Department of Natural Resources (department) received an updated water quality trading (WQT) plan for continued compliance with effluent phosphorus limits at the Slinger Wastewater Treatment Facility on January 29, 2025 and September 15, 2025. The updated plan includes an evaluation of the credit needed for compliance through WQT and confirms that the assumptions of the original WQT plan have been installed and maintained. The department has reviewed the updated WQT plan materials and has no further comments at this time.

Based on the department's review, the WQT plan materials are in general conformance with the Water Quality Trading Guidance and Wis. Stat 283.84. Streambank stabilization has been effective in reducing erosion to the Rubicon River. Suitable fish habitat features such as root wads and cobbles have been installed along the project area. The treatment facility has continued to discharge phosphorus near or below the target concentration of 0.1 mg/L, and occasionally meets the 0.075 mg/L six month average limit directly at outfall 001. Therefore, no changes to the original WQT plan are needed. Based on the timing of practice installation in late 2021 and full establishment of vegetation in 2022, the last (10th) year of interim credit availability will be 2031. The table below illustrates the total credit availability resulting from eligible practices for the next five years.

Year	2027	2028	2029	2030	2031
Interim Credits	16.6	16.6	16.6	16.6	16
Long Term Credits	45	45	45	45	45
Total	61.6	61.6	61.6	61.6	61.6

The department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The department has assigned the WQT plan a tracking number of WQT-2026-0015 and will be referenced as such in the draft WPDES permit. The WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring for total phosphorus.

If you have any questions, please call or email me at (414) 897-5723 or nicholas.lent@wisconsin.gov.

Sincerely,

Nick Lent
Wastewater Engineer

cc: Greg Moser – Village of Slinger
Dave Arnott and Ethan Botmen – Ruekert-Mielke
Matt Claucherty, Betsyjo Howe, and Justin Meyers – Wisconsin DNR

WATER QUALITY TRADING PLAN UPDATE

**VILLAGE OF SLINGER
WASHINGTON COUNTY, WISCONSIN
SEPTEMBER 2025**

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WATER QUALITY TRADING PLAN

INTRODUCTION

The Village of Slinger Wastewater Treatment Facility (WWTF) received its renewed Wisconsin Pollutant Discharge Elimination System (WPDES) permit in July of 2014. The permit contains an ultimate effluent total phosphorus (TP) water quality-based effluent limit (WQBEL) of 0.075 mg/L with an annual averaging period. This reduced phosphorus limit stems from the changes to Wisconsin Administrative Code (WAC) Chapters NR 217 and 102, more commonly referred to as the “Phosphorus Rule”. This rule was passed on December 1, 2010. Changes to WAC Chapter 102 establish water quality standards for various surface waters in or adjacent to Wisconsin. WAC NR 217 specifically outlines requirements for wastewater treatment facilities.

The 0.075 mg/L limit is significantly lower than the technology-based monthly limit of 1.0 mg/L that had been in place in previous permits. The Village had to comply with the ultimate limit by June 30, 2021. To assist the Village with this effort, the permit contained a compliance schedule with various steps the Village must take towards meeting the ultimate phosphorus limit. These consisted of assessments to determine what compliance strategies were necessary.

The main component of the compliance strategy was chemical optimization and biological phosphorus removal at the WWTF. Water Quality Trading (WQT) was also used to supplement chemical optimization if it wasn't adequate to meet the WQBEL.

With WQT, point source reductions or specific practices to reduce runoff from nonpoint sources were implemented and modeled with a site-specific model such as SNAP PLUS or the NRCS Streambank Erosion Estimator. The pollutant reductions were then applied to the municipal WPDES permit. The credits from WQT allow a higher (less stringent) effluent phosphorus level from the WWTF. These credits are valuable in helping Slinger achieve the last required portion of phosphorus removal and have been used as “insurance” for the Village to mitigate the situation where there is a plant upset and higher levels of phosphorus are temporarily discharged. The WQT program also allows the Village to have an effective higher effluent limit of 0.095 mg/L total phosphorus instead of standard of 0.075 mg/L. Previous optimization testing indicated that they could not consistently meet the 0.075 mg/L level.

Update on Optimization Activities and Pollutant Offset Needed

Figure 1 below summarizes effluent TP calculations at the Slinger WWTF for the two years prior to the original 2019 plan, prior to any WQT projects. That time period was a good representation of the Village's chemical and biological optimization efforts at the WWTF when continuous chemical dosing started in the middle of April 2017. In the calendar year 2018, the average effluent TP concentration was 0.083 mg/L. From May of 2018 through April of 2019, the average effluent TP concentration was 0.090 mg/L. Over the period shown in Figure 1, the average effluent TP concentration was also 0.090 mg/L. Based on those results, the Village had determined that WQT is needed to supplement chemical optimization at the WWTF in order to meet the WQBEL.

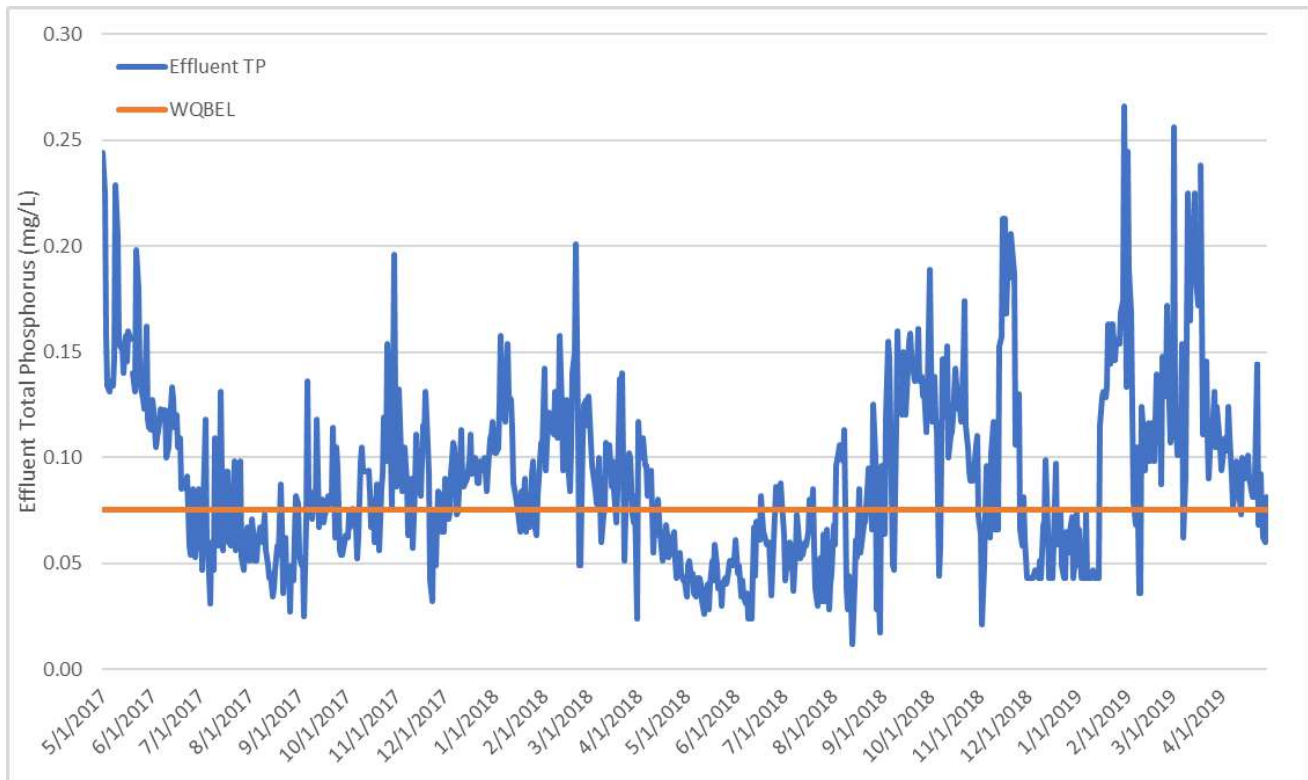


Figure 1: Effluent TP Concentration at the Slinger WWTF from May 2017 through April 2019
It was determined that the required offset to comply with WQBEL was calculated using this equation:
 $(0.095 \text{ mg/L} - 0.075 \text{ mg/L}) \times 1.0 \text{ MGD} \times 8.34 \times 2.4 \times 365 \text{ days/year} = \mathbf{146 \text{ lbs./year}}$

The required TP offset to comply with the Village's WQBEL was determined to be 146 lbs/year. This assumed an average TP discharge concentration of 0.095 mg/L, a flowrate of 1.0 MGD, and a trade ratio of 2.4. The concentration was determined to be achievable by Village staff based on the data presented in Figure 1. Higher total P levels in the latter portion of the two years shown is attributed to final clarifier and other repairs around the plant. The flowrate average flowrate at the time was also 0.81 MGD, making 1.0 MGD a conservative rate that left room for growth. The trade ratio was determined at the time in coordination with the WDNR staff, with an explanation in the latter portion of this plan.

This WQT limit can be utilized in more recent data to demonstrate how phosphorus reduction has improved at the facility, as seen in Figure 2.

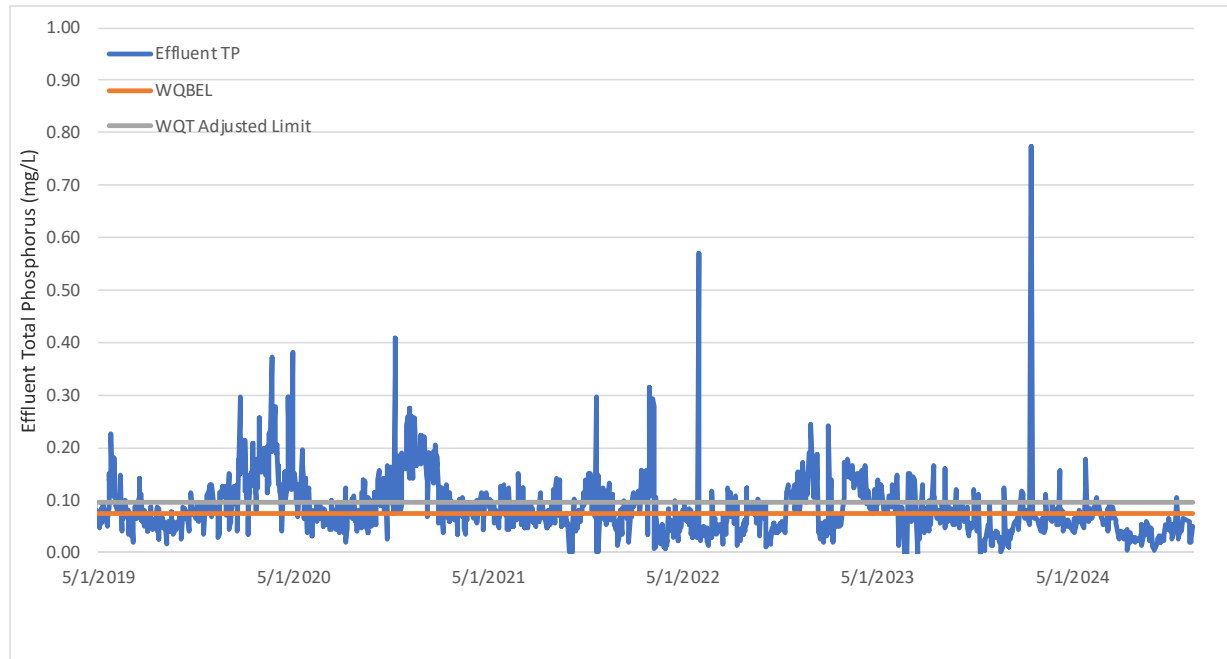


Figure 2: May 2019 to December 2024 Phosphorus Effluent Levels

This data indicates that there has been a decline in WWTF phosphorus levels as time has progressed, as on average the last year the phosphorus concentration was 0.058 mg/L, not utilizing any of their WQT credits. 2024 was also the first full year that Slinger WWTF reduced its acceptance of hauled waste, which was done to primarily reduce chlorides. This also benefited the phosphorus levels, as it improved their biological and chemical removal processes due to the reduction in high phosphorus loading sources. The WWTF continued utilizing polyaluminum chloride for chemical removal at similar levels, which increased their removal efficiency of phosphorus.

The Village also has to contend with chloride level restrictions, which chemical addition for phosphorus reduction contradicts with. Reduction of chemical addition would also decrease the solids generation from both phosphorus biosolids and chemical sludge, as well as lowering chloride that is introduced in water treatment. The Village will look to reduce chemical dosage by 5% to 10% and monitor their phosphorus levels to be more in line with the WQT range of 0.75 to 0.94 mg/L (between the orange and gray lines on Figure 2).

The remaining portions of this plan detail aspects from the initial trading plan that were critical to the determination of possible credits and the stabilization design development and selection.

STREAMBANK STABILIZATION SITE ANALYSIS

In anticipation that the Village needed additional phosphorus credits to meet the WQBEL, Slinger conducted a survey of nonpoint sources of TP in their HUC-12. The results of this survey was communicated in a number of past reports submitted as a part of the Village's compliance schedule. A preliminary survey of streambanks in the area showed that there were several areas in the City of Hartford that could benefit from conservation measures.

The selected site was a section of the Rubicon River in the City of Hartford, approximately 7.0 stream miles downstream of the Slinger WWTF. The site was in the same HUC-12 as the Slinger WWTF (Headwaters Rubicon River – 070900010302). Figure 3 shows the location of the credit user and credit generator within the Headwaters Rubicon River HUC-12. There is a SWIMS Station immediate downstream of the site (ID 673239) which contains minimal data from a statewide sediment analysis conducted in 1995-1996. The Rubicon River was impaired for phosphorus in this location. There are no mapped wetlands on the site, but there were wetland indicators adjacent to the river. The DPW facility south of the river used to be the location of the Hartford wastewater treatment facility before it moved further west, so the 10.77 acres of industrial land adjacent to the river is owned by the City of Hartford. During the most extreme weather events, water levels were reported to rise to the bottom of the bridges on either end of the site limits.

The Village of Slinger received comments from WDNR staff on the preliminary site analysis, and it was determined that an additional site survey was necessary to get a more accurate picture of the potential credits available at the site. The following discussion details the efforts to quantify the credits available at the Harford DPW Site.

The WDNR requested a comprehensive soil analysis of the site. The total length of the north and south banks of the Rubicon River between N. Wacker Dr. and Grant St. was measured to be 875 ft. In order to meet soil sampling guidance published by UW-Extension, the surveyor collected composite samples for 215-220 ft. sections of the streambank. These sections were labeled as “SB1”, “SB2”, etc. as shown in Appendix A in order to reflect their relative location along the north or south bank. 6-inch core samples were taken every 20 ft., giving a total of 11 sub-samples per composite. In addition, the surveyor followed the recommended W-shaped sampling pattern in collecting core samples, alternating sampling locations along the height of the bank. The results of the soil analyses are included in Appendix B.

At each of the core sampling locations, the height of the bank was also measured in order to give an average streambank height measurement for each streambank section. The results of the streambank height measurements, including the average height, are shown below in Table 1. For clarification, there is typically a differentiation made between the terms “bank height” and “eroding bank”. In this application, the streambank height measurements were made from the approximate normal water level to the crest of the bank. Based on conversations with staff of the City of Hartford, the water level reaches this crest during significant rain events, so the entire measured height was assumed to be a potential “eroding bank”. For this reason, these two terms are used interchangeably for the remainder of the plan.

In order to be conservative, the bank height measurements for the southern bank were divided in half to give a reduced eroding bank height that accounts for established grassy vegetation on that bank. This assumption was not made for the northern bank as much of the ground on this bank was bare and there were significantly more visual signs of erosion.

Table 1. Streambank Height Measurements Taken by Section during Site Survey

SB1	SB2	SB3	SB4	NB1	NB2	NB3	NB4
10	10.5	14	15	16	13	11	15.5
10	10	17	14.5	11	12	12.5	15
9	9.5	14	14	12	14	13	16
10	11	15	12	12	15	13	14.5
10	12	15.5	15	14	13	12	15
12	15	16.5	13	13	14	11.5	15.5
10.5	15	20	11	13	15	12	16
9	16	17	10.5	13	14	11	17
8	16	13.5	11	15	12	13	18
8	14	18	14	16	11	14	19.5
8.5	13.5	16	15	13.5	13.5	14	20
9.5	13.0	16.0	13.2	13.5	13.3	12.5	16.5

SSURGO soil maps from the Web Soil Survey were used to determine the predominant soil type at the site. Appendix C includes a soil map of the site, showing that the predominant soil type along the Rubicon River is Pella silt loam.

The following sections include pictures and a summary of notes and observations taken for each of the streambank sections included in the analysis. In addition, discussion of the assumptions made to populate the NRCS Streambank Erosion Estimator are included.

South Bank 1 and North Bank 1

South Bank (SB) 1 and North Bank (NB) 1 were the 220 ft. sections directly west of Grant St. The average streambank height of SB1 was 9.5 ft., and the average streambank height of NB1 was 13.5 ft. The soil TP concentration was 680 ppm and 720 ppm for SB1 and NB1, respectively. Figures 3-5 show various perspectives of the north and south bank for reference. There are three active storm water outlets in this section of the river which contribute storm water flows directly to the Rubicon River. Based on the location of these outlets, no direct scouring of the streambank was assumed to occur as a result of storm water flows.

The southern bank is vegetated but had a fairly steep slope down to the water level. Through the vegetated cover there were signs of soil loss throughout the measured streambank height, but the erodible bank height was divided by two to account for the stabilization provided by the existing vegetation. The lateral recession rate was estimated to be 0.05 ft./year per guidance included in the NRCS Streambank Erosion Estimator. The recession rate was determined to be “slight” due to some patches of bare bank, some rills, but no vegetative overhang or exposed tree roots.

The northern bank was covered with trees and brush but the soil was predominantly bare. There were exposed tree roots and other visual signs of erosion. For this reason, the entire average bank height was considered erodible, and the lateral recession rate was assumed to be 0.20 ft./year, or “moderate”.



Figure 4. SB1/NB1 Streambank Image 1



Figure 5. SB1/NB1 Streambank Image 2



Figure 6. SB1/NB1 Streambank Image 3

South Bank 2 and North Bank 2

South Bank 2 and North Bank 2 were the 220 ft. sections adjacent to businesses that exist north of the site, west of SB1 and NB1. The average streambank height of SB2 was 13.0 ft., and the average streambank height of NB2 was 13.3 ft. The soil TP concentration was 590 ppm and 540 ppm for SB2 and NB2, respectively. Figures 6-8 show various perspectives of the north and south bank for reference.

The southern bank was similarly vegetated to SB1 but has a gentler slope to the water level. Through the vegetated cover, there were still signs of soil loss, so the erodible bank height was again divided by two to account for the stabilization provided by the existing vegetation. The lateral recession rate was estimated to be 0.05 ft./year.

The northern bank had longer sections without trees and brush and the soil is predominantly bare. The erosion in this section was observed to be greater than NB1, with exposed tree roots, trees falling into the river, and notable signs of erosion. Again, the entire average bank height was considered erodible, and the lateral recession rate was assumed to be 0.40 ft./year, or “severe”. Erosion in this section was assumed to occur by scouring from the stream during high flows as well as by overland flow, freezing, and thawing across the entire bank. There was gravel from the parking lots of the adjacent businesses in several segments of NB2, showing that plowing and runoff from the adjacent parking lot may have been contributing to the deterioration of the streambank. For this reason, measures beyond the stabilization of the section of the streambank may be required to address all causes of erosion for this section of the streambank. These measures may include the City working with the owners of the businesses adjacent to the streambank to alter their methods of snow plowing during winter months to eliminate gravel and soil being pushed towards the stream location. If working with the business owners is not effective, the Village of Slinger may consider adding a barrier along the property line of sections of the streambank most susceptible to receiving gravel and soil from the adjacent parking lot areas.



Figure 7. SB2/NB2 Streambank Image 1



Figure 8. SB2/NB2 Streambank Image 2



Figure 9. SB2/NB2 Streambank Image 3

South Bank 3 and North Bank 3

South Bank 3 and North Bank 3 were the 220 ft. sections adjacent to businesses that existed north of the site, west of SB2 and NB2. The average streambank height of SB3 was 16.0 ft., and the average streambank height of NB3 was 12.5 ft. The soil TP concentration was 320 ppm and 440 ppm for SB3 and NB3, respectively. Figures 9-11 show various perspectives of the north and south bank for reference.

The southern bank was qualitatively similar to SB2. The erodible bank height was again divided by two to account for the stabilization provided by the existing vegetation. The lateral recession rate was estimated to be 0.05 ft./year. The northern bank was also very similar to the adjacent section NB2. The lateral recession rate was again assumed to be 0.40 ft./year, or “severe”, with the entire bank height showing signs of erosion.



Figure 10. SB3/NB3 Streambank Image 1



Figure 11. SB3/NB3 Streambank Image 2



Figure 12. SB3/NB3 Streambank Image 3

South Bank 4 and North Bank 4

South Bank 4 and North Bank 4 were the 215 ft. sections directly east of N. Wacker Dr. The average streambank height of SB4 was 13.2 ft., and the average streambank height of NB4 was 16.5 ft. The soil TP concentration was 420 ppm and 610 ppm for SB4 and NB4, respectively. Figures 12-14 show various perspectives of the north and south bank for reference.

The southern bank was similarly vegetated to past sections of the southern bank. The erodible bank height was again divided by two to account for the stabilization provided by the existing vegetation. The lateral recession rate was increased to 0.1 ft./year to account for the disrupted area of the bank as well as generally steeper slopes to the river location.

The northern bank section east of N. Wacker Dr. had a greater concentration of brush than sections NB2 and NB3. Also, there was a portion of the northern bank that serves as a depositional area in the eastern half NB4. For these reasons, the proposed length of streambank stabilization measures was reduced from 220 ft. to 130 ft per recommendation of WDNR staff. The 130-foot portion that the Village was planning to stabilize was in the northwestern portion of NB4, extending from the bridge southeast to the start of the depositional area. A lateral recession rate of 0.20 ft./year was assumed for this section of the bank as it is qualitatively similar to NB1. An erodible bank height of 12.4 ft. was assumed for the 130-foot portion of the streambank which is 75% of the average measured bank height.



Figure 13. SB4/NB4 Streambank Image 1



Figure 14. SB4/NB4 Streambank Image 2



Figure 15. SB4/NB4 Streambank Image 3

QUANTIFICATION OF CREDITS

Using the information and assumptions from the survey described above, the NRCS Streambank Erosion Estimator was used to quantify credits. The results of the analysis are shown below in Table 2 and Table 3.

Table 2. Estimated Soil Loss per Year

Field Number	Eroding Streambank Reach Number	Eroding Bank Length (Feet)	Eroding Bank Height * (Feet)	Area of Eroding Streambank (FT ²)	Lateral 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)
Rear of DPW Site	SB1	220.0	4.8	1,045	0.05	52.3	Silt Loam	85	2.2
	SB2	220.0	6.5	1,430	0.05	71.5	Silt Loam	85	3.0
	SB3	220.0	8.0	1,760	0.05	88.0	Silt Loam	85	3.7
	SB4	215.0	6.6	1,419	0.10	141.9	Silt Loam	85	6.0
	NB1	220.0	13.5	2,970	0.20	594.0	Silt Loam	85	25.2
	NB2	220.0	13.3	2,926	0.40	1,170.4	Silt Loam	85	49.7
	NB3	220.0	12.5	2,750	0.40	1,100.0	Silt Loam	85	46.8
	NB4	130.0	12.4	1,609	0.20	321.8	Silt Loam	85	13.7
Total Estimated Annual Streambank Erosion Soil Loss (Tons):									150.4

Table 3. Estimated Phosphorus Loss per Year

Field Number	Eroding Streambank Reach Number	Estimated Soil Loss (Tons/Year)	Estimated Soil Loss (Pounds/Year)	Estimated Soil Loss (Kgs/Year)	Phosphorous Concentration (ppm)	Estimated Phosphorous Loss (Kgs/year)	Estimated Phosphorous Loss (Lbs/year)
Rear of DPW Site	SB1	2.2	4441.25	2019	680	1.4	3.0
	SB2	3.0	6077.5	2763	590	1.6	3.6
	SB3	3.7	7480	3400	620	2.1	4.6
	SB4	6.0	12061.5	5483	420	2.3	5.1
	NB1	25.2	50490	22950	720	16.5	36.4
	NB2	49.7	99484	45220	540	24.4	53.7
	NB3	46.8	93500	42500	440	18.7	41.1
	NB4	13.7	27348.75	12431	610	7.6	16.7
Total Estimated Annual Phosphorous Loss (Lbs):							164.2

Based on the NRCS Streambank Erosion Estimator, the entire streambank length for both banks yielded approximately 164.2 lbs./year in TP loss. However, the north bank showed a greater potential for reducing phosphorus losses to the Rubicon River, totaling 147.9 lbs./year compared to 16.3 lbs./year estimated for the south bank.

TRADE RATIO DISCUSSION

The WQT guidance developed by the WDNR uses trade ratios to ensure that load reductions generated by the implementation of pollutant management measures result in a net water quality improvement at the point of standards application. This ratio takes five factors into account in its calculation:

- Delivery – accounts for the distance between the credit generator and the credit user
- Downstream – accounts for the relative position of the credit generator to the credit user in the watershed
- Equivalency – accounts for different chemical forms of the traded pollutant
- Uncertainty – accounts for modeling inaccuracies when quantifying load reductions
- Habitat Adjustment – accounts for the wildlife habitat benefits of wetland restoration

The trade ratio is then calculated with the following equation:

$$\text{Trade Ratio} = \text{Delivery} + \text{Downstream} + \text{Equivalency} + \text{Uncertainty} - \text{Habitat Adjustment} : 1$$

There is no equivalency factor used when trading phosphorus reduction credits, so this factor was negligible in this case. Also, no delivery factor was required for the current project site. All credits generated upstream of the Slinger WWTF received a downstream factor of 0, while those downstream of the treatment plant received a downstream factor of 0.1 to 0.8 depending on the difference between the credit user's load and the total load at the credit user's discharge point. It is important to note that downstream credits could only be generated within the same HUC-12 sub-watershed as the credit user. Finally, the uncertainty factor ranged from 1 to 4 based on the pollutant management measure implemented by the credit generator. The minimum trade ratio for point to nonpoint source trades was 1.2:1.

For the proposed streambank project, the two components of the trade ratio calculation were the downstream factor and the uncertainty factor. Based on WQT guidance, the uncertainty factor for streambank stabilization is either 2.0 or 3.0 depending on the inclusion of habitat restoration. The Village partnered with an engineering consultant with experience in streambank restoration in order to ensure that habitat restoration was included in the streambank restoration.

The downstream factor is calculated by determining the percent difference between the credit user's load (Slinger WWTF) and the total load at the point of the credit user's discharge. Through correspondence

with WDNR staff, the Village determined that this percent difference was between 50-75% assuming a level of treatment of 0.12 mg/L TP at the Slinger WWTF. This percent difference corresponds to a downstream factor of 0.4 which was assumed for the purposes of this plan.

Taking these two assumptions together, the total trade ratio applied to the proposed project is 2.4.

DESIGN AND MAINTENANCE CONSIDERATIONS

Of the two banks evaluated in the site survey, the Village focused primary on the north bank which shows a greater need for stabilization work. One of the first goals of the stabilization effort was to conduct a plant survey of the riparian edge of the stream location to determine the extent of invasive species such as reed canary grass or buckthorn. All invasive species were eradicated and replaced with native plantings as a part of the streambank stabilization design. All existing rocks and natural vegetation along the shoreline were preserved and utilized for the project.

There were several stabilization techniques that were implemented. These techniques included brush matting, branch packing, geotextile wrapped soil lifts, and stone toe protection combined with native plantings.

Brush matting (or brush mattresses) involves a combination of live stakes, live fascines, and branch cuttings to cover and stabilization streambanks. An example figure is shown below. A thick mat of dormant cuttings is placed on the bank and held down with stakes. The brush mattress serves as structural reinforcement as well as an area where native plantings can take root and provide vegetative stabilization. For the current project site, this technique was used alongside stone toe protection to a level at or above the ordinary high water level.

In addition to the restoration of riparian vegetation and the reduction of soil erosion, this technique improved fish habitat by shading the stream, lowering water temperatures, and offering protection from predators. Other means of fish habitat restoration were accomplished through the arrangement of rip-rap up to the ordinary high water mark and with the installation of intermittent rootwad composites along the streambank. An example rootwad composite detail is shown below. Existing fallen trees and cleared trees along the streambank were used in the construction of the rootwad composites. The quantity and location of the fish habitat structures can be seen in the design drawings and permitting. Photos of these habitats can be seen in the photo log in Appendix D.

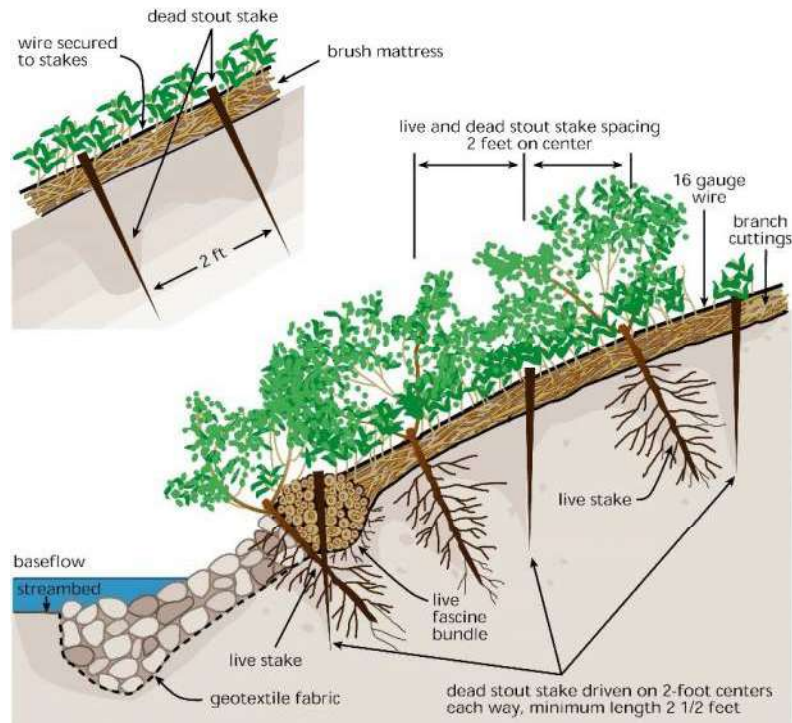


Figure 16. Example of Brush Matting Streambank Technique. Image Credit: Stream Corridor Restoration: Principles, Processes and Practices, 10/98, by the Federal Interagency Stream Restoration Working Group (FISRWG).

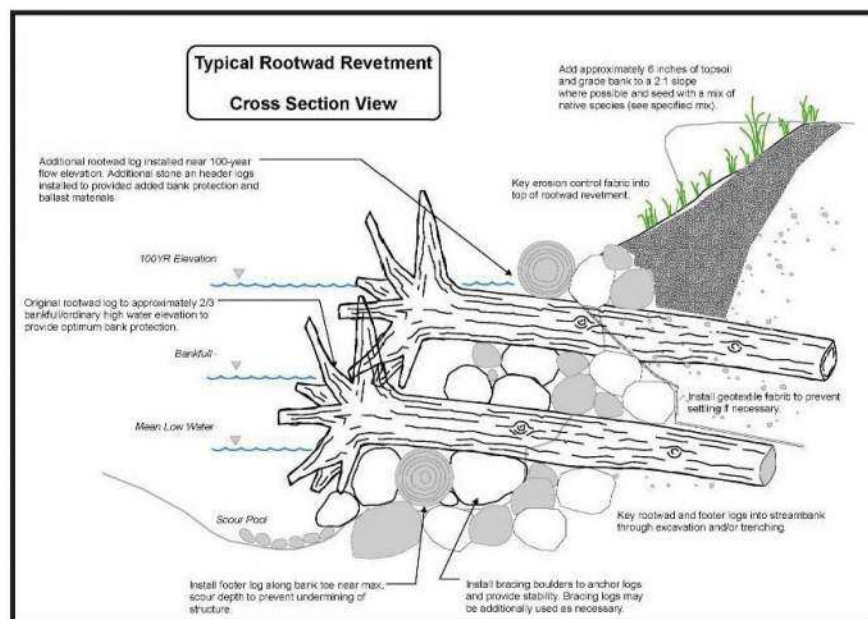


Figure 17. Typical Rootwad Composite Detail.

In addition to all design and implementation responsibilities, the Village of Slinger also developed and implemented a regular operation and maintenance (O&M) plan for ensuring adequate performance and long life of the practice. The plan is consistent with NRCS Code 580, and is included in Appendix D for reference. The maintenance logs generated since the construction are also included in Appendix D.

Per NRCS guidance, the streambank stabilization O&M plan defined the set intervals at which the practice will be inspected, including after every flood event. Maintenance activities include:

- Removal of debris in the stream that diverts flow to the streambank causing increased scouring and erosion.
- Monitoring and maintaining the establishment of native planting and control of invasive species if necessary.
- Repair of any damaged structural sections of the practice.
- Revegetation of areas affected by erosion.
- Photographic documentation of inspection and maintenance activities conducted at each O&M visit.

The Village's O&M plan also involved ensuring that no gravel or other materials are entering the stabilized section of the streambank from upland areas including the businesses along the north bank that were discussed in previous sections of this plan. As previously mentioned, the Village of Slinger and the City of Hartford worked with these property owners to mitigate these concerns and the Village O&M plan included provisions to monitor these sources of upland pollutants.

The purpose of management practice registration was to ensure the management practice had been properly installed in accordance with the intended design and final Water Quality Plan of the Village. Once the project was registered, the WDNR was able to more easily review information related to the maintenance of the practice for trade verification and auditing. The filed Management Practice Registration Form is included in Appendix E. In addition to management practice registration, an annual report is completed by the Village to verify the proper maintenance of the streambank stabilization practice. The report also notifies the WDNR about any changes to the trade agreement or compliance-related issues. Should the practice permanently fail, the Village would complete a Notice of Termination form along with additional coordination with WDNR staff.

In the past year maintenance has consisted of spraying herbicide to prevent reed canary grass, an invasive species in the area, as well as other weeds. These maintenance logs can be found in Appendix D as well.

WATER QUALITY TRADING PLAN IMPLEMENTATION AND TIMELINE

The estimated 164.2 lbs./year TP exceeded the amount of credits required by the Village WWTF to meet its WQBEL (146 lbs./year including an assumed trade ratio of 2.4). In fact, the estimated reduction from the north bank alone exceeds the threshold. For this reason, the Village limited their plans to implement streambank stabilization measures to concentrating on the entire length of the north bank only (with the exception of the depositional area of NB4) surveyed in this plan.

The Village understands that there is currently a difference between interim and long term credits as defined by the Rock River TMDL. This project was located in Reach 20 of the Rubicon River, which required a nonpoint source reduction of 27%. For this reason, 27% of the credits generated as a result of this project (approximately 40 pounds of TP per year) are considered interim credits, having a ten-year duration. The Village has accounted for the loss of these credits by continuing to optimize their effluent quality at the treatment facility. To make up for this loss in credits generated at the ten-year mark, the

Village has maintained a slightly lower effluent TP concentration of approximately 0.089 mg/L at 1.0 MGD.

The project was designed, permitted, and bid the project for construction in early 2021, with construction completed by the end of 2021. The goal was to have the practice implemented by the end of the June 2021. The Village maintained communication with the WDNR throughout the initial timeline and made adjustments when necessary.

The Village of Slinger finalized negotiations and reached a trade agreement with the City of Hartford to install the project. The City of Hartford acted as the sole partner in the proposed trade agreement. Finalization of the trade agreement was completed after the approval of the initial WQT plan, simultaneously with the initial design process.

To date the long-term credits from water quality trading have been sufficient for the Village to maintain their phosphorus effluent standards at the plant, and an increase in loading is not anticipated in the future. Therefore, the long-term credits are expected to be sufficient for the future. There is a long-term credit usage tracker included in Attachment 3 of this report.

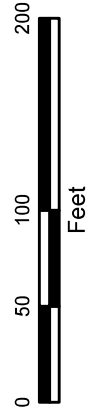
Appendix A

Streambank Stabilization Site Exhibit

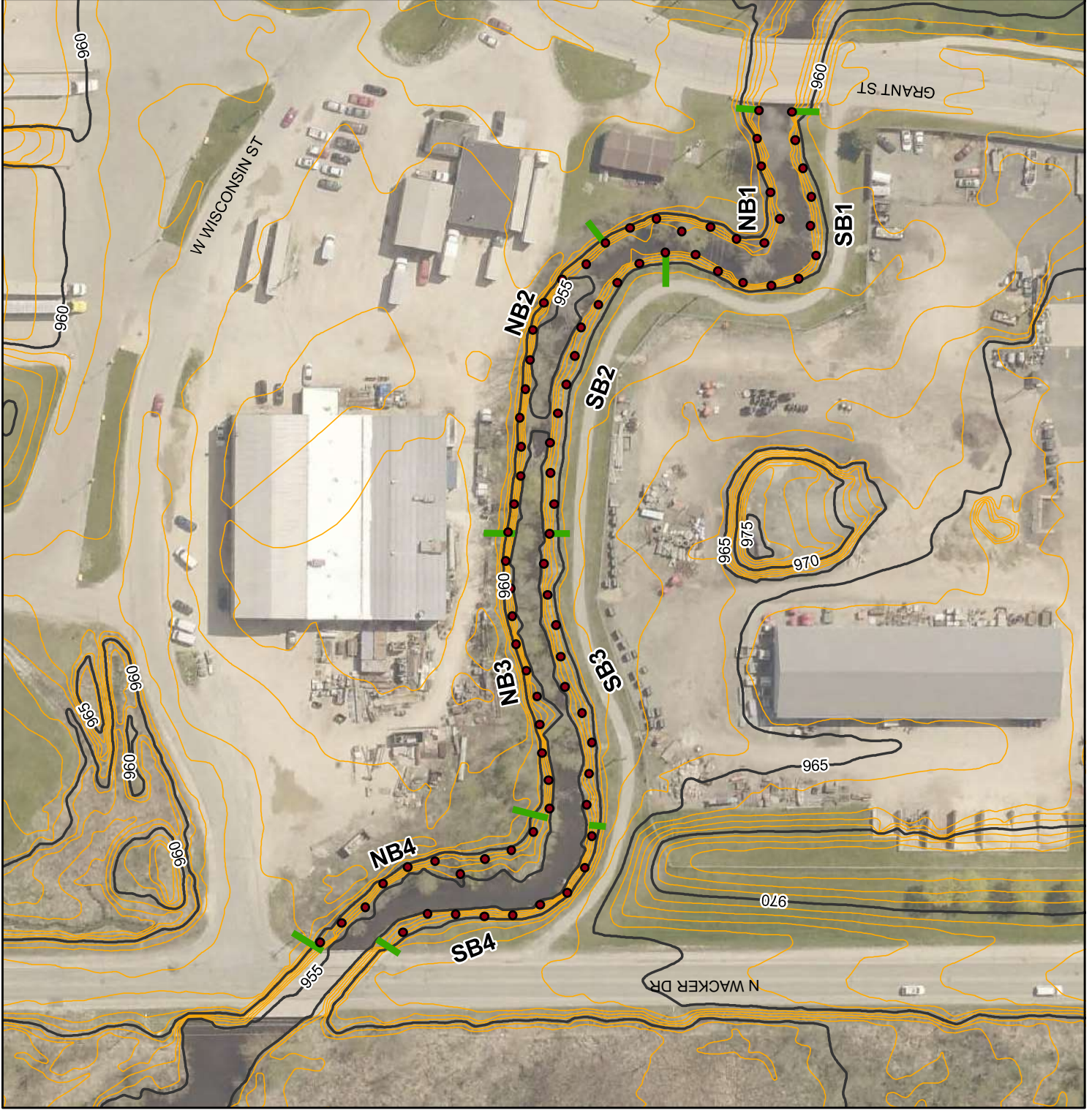
**Rubicon River Streambank
Stabilization Site**
City of Hartford, WI

Legend

- Soil Sample Sites
- Streambank Reach Boundary
- 5' Index Contour
- 1' Intermediate Contour



DATE: April 2019



Appendix B

Soil Lab Analysis

Client: Ruekert-Mielke Inc
Attn: David Arnott
W233 N2080 Ridgeview Parkway
Waukesha, WI 53188

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 04/18/19 Page 1 of 2
NLS Project: 319262
NLS Customer: 88946
Fax: 262 542 5631 Phone: 262 542 5733

Project: Waterford Streambank

SB 1 NLS ID: 1114644

COC: 218400:1 Matrix: SO

Collected: 04/09/19 13:30 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.068	% DWB	5	0.00025*	0.00082*	04/17/19	SW846 6010B	721026460
Solids, total on solids	79.2	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

SB 2 NLS ID: 1114645

COC: 218400:2 Matrix: SO

Collected: 04/09/19 14:00 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.059	% DWB	5	0.00024*	0.00080*	04/17/19	SW846 6010B	721026460
Solids, total on solids	76.6	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

SB 3 NLS ID: 1114646

COC: 218400:3 Matrix: SO

Collected: 04/09/19 14:30 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.062	% DWB	5	0.00026*	0.00086*	04/17/19	SW846 6010B	721026460
Solids, total on solids	76.6	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

SB 4 NLS ID: 1114647

COC: 218400:4 Matrix: SO

Collected: 04/09/19 15:00 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.042	% DWB	5	0.00020*	0.00068*	04/17/19	SW846 6010B	721026460
Solids, total on solids	78.5	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

NB 1 NLS ID: 1114648

COC: 218400:5 Matrix: SO

Collected: 04/09/19 15:30 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.072	% DWB	5	0.00031*	0.0011*	04/17/19	SW846 6010B	721026460
Solids, total on solids	62.9	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

NB 2 NLS ID: 1114649

COC: 218400:6 Matrix: SO

Collected: 04/09/19 16:00 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.054	% DWB	5	0.00021*	0.00072*	04/17/19	SW846 6010B	721026460
Solids, total on solids	76.5	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 04/18/19 Page 2 of 2
NLS Project: 319262
NLS Customer: 88946
Fax: 262 542 5631 Phone: 262 542 5733

Client: Ruekert-Mielke Inc
Attn: David Arnott
W233 N2080 Ridgeview Parkway
Waukesha, WI 53188

Project: Waterford Streambank

NB 3 NLS ID: 1114650

COC: 218400:7 Matrix: SO

Collected: 04/09/19 16:30 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.044	% DWB	5	0.00020*	0.00067*	04/17/19	SW846 6010B	721026460
Solids, total on solids	83.4	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

NB 4 NLS ID: 1114651

COC: 218400:8 Matrix: SO

Collected: 04/09/19 17:00 Received: 04/12/19

Parameter

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, total recoverable as P by ICP	0.061	% DWB	5	0.00034*	0.0012*	04/17/19	SW846 6010B	721026460
Solids, total on solids	64.1	%	1	0.10*		04/12/19	SM 2540-G 20ed	721026460
Metals digestion - tot. recov (solid) ICP	yes					04/16/19	SW846 3050M	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.

ND = Not Detected (< LOD) LOD = Limit of Detection

DWB = Dry Weight Basis %DWB = (mg/kg DWB) / 10000

MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

LOQ = Limit of Quantitation NA = Not Applicable

Reviewed by:

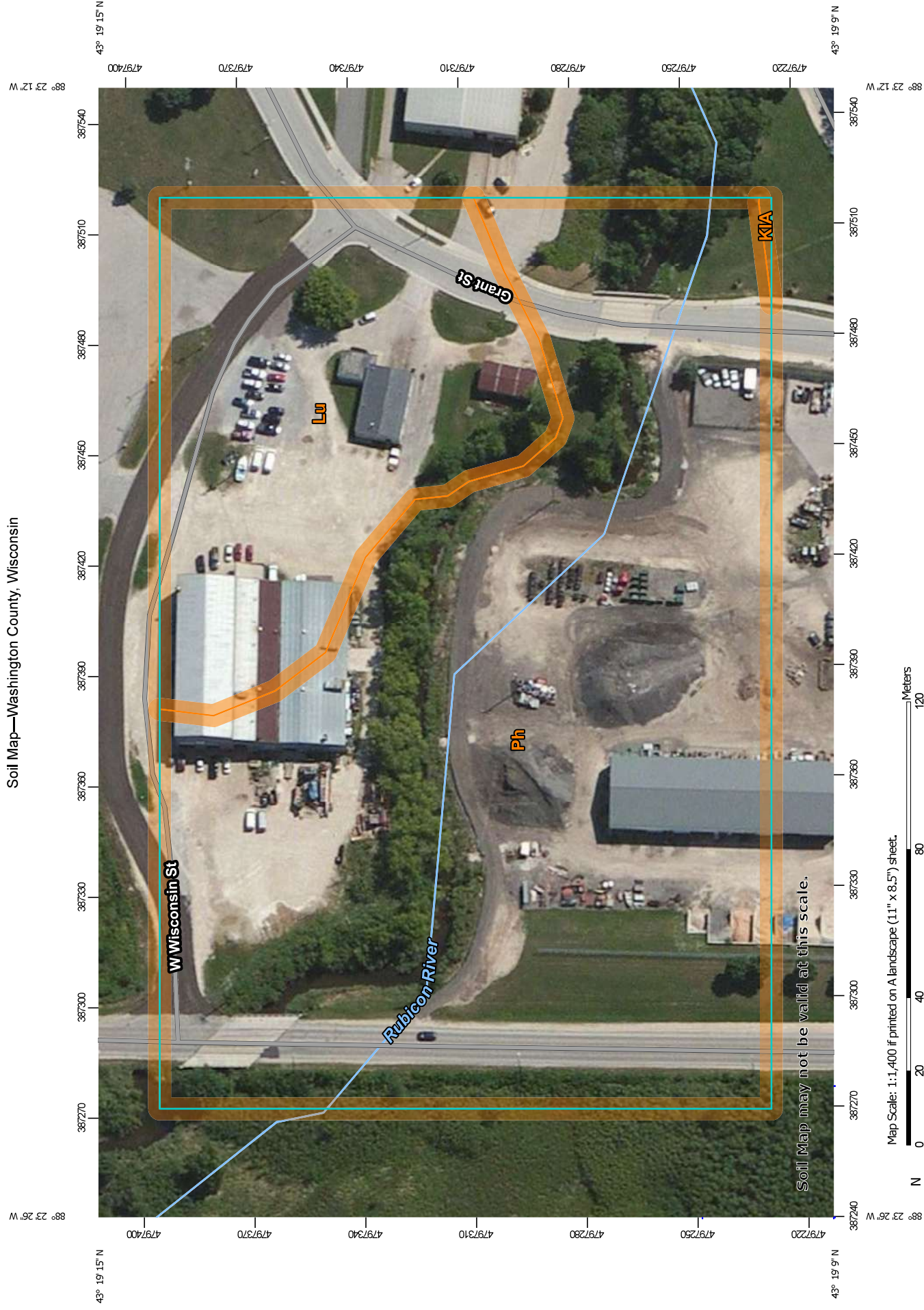
Authorized by:
R. T. Krueger
President



Appendix C

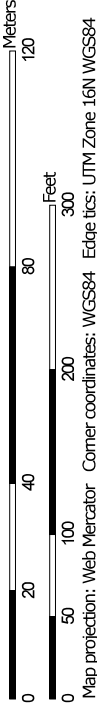
Soil Type Map

Soil Map—Washington County, Wisconsin



Soil Map may not be valid at this scale.

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



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



**Natural Resources
Conservation Service**

**Web Soil Survey
National Cooperative Soil Survey**

5/1/2019
Page 1 of 3

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

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Washington County, Wisconsin
Survey Area Data: Version 18, Sep 12, 2018

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

Date(s) aerial images were photographed: Apr 29, 2011—Sep 6, 2011

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KIA	Kendall silt loam, 1 to 3 percent slopes	0.0	0.1%
Lu	Loamy land	2.7	26.4%
Ph	Pella silt loam, 0 to 2 percent slopes	7.5	73.5%
Totals for Area of Interest		10.2	100.0%

Appendix D

Operation and Maintenance Plan Documents, Reports, and Photo Log

Rubicon River Streambank Stabilization

Hartford/Slinger, WI

MAINTENANCE PLAN



Prepared by:
Resource Environmental Solutions

April 28, 2022



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METHODS

1. Undesirable species control

Control of undesirable plant species will be performed throughout all plant community zones within the site boundaries as shown in the plans and site map provided. The focus of vegetation management shall be ensuring success of the planted and seeded vegetation in all plant community zones. This will be accomplished by using an adaptive management plan. Plans often change in response to new data and derived insights. For these reasons, this plan should be viewed as being neither conclusive nor absolute. This program is a starting point in an ongoing process of restoring the site's natural processes.

When regular monitoring and maintenance begins in spring 2022, it will provide feedback on the plan's effectiveness, and generate information to evaluate and justify the need for changes. This process of evaluation, adjustment, refinement, and change is called "Adaptive Management." Adaptive management is a tool that is fundamental to the restoration, management, and maintenance work in the management plan described below.

For stream bank and upland buffer maintenance, a minimum number of three site visits will be scheduled during the first growing season. In years two and three, a minimum number of two site visits will be scheduled. Each trip will include monitoring of all planted locations. Resource Environmental Solutions (RES) will supply a maintenance log (*Please see Appendix A for a copy of this log*) for each visit with a description of treatments and findings. For each trip, the Engineer will be notified a day in advance.

Noxious weeds and other invasive plant species as identified in Chapter NR 40, Wisconsin Administrative Code – Invasive Species Identification, Classification and Control shall be controlled by appropriate means. Not more than 10 percent vegetation cover of any of these species shall be present in the seedbed and planted areas after two years following the initial seeding and planting and at the termination of the maintenance period.



Main Tools for Control

Herbicide Management:

The main tool for invasive species control needed at the site will be chemical control using a backpack sprayer. We will selectively spray any undesirable vegetation throughout all of the plant community zones with little to no disturbance to native vegetation. Undesirable vegetation to be controlled, but not limited to, is reed canary grass, purple loosestrife, giant reed grass, spotted knapweed, Canada thistle, teasel, garlic mustard, common/glossy buckthorn, bush honeysuckle, etc. Care will be taken in the application and selection of chemicals to avoid damage to the live stake plantings. All chemicals to be used on this site will be approved by owner or owners representative prior to use. *(Please see Appendix D for a copy of list of herbicides proposed for use)*

At all times, RES will follow the application guidelines listed in the herbicide labels for percent solution and rates per acre, disposal, etc. Also dictated on the label are the site conditions that particular herbicide may be applied. For example, by law, RoundUp cannot be applied over water, but Rodeo can. Chemicals that will be used onsite in aquatic areas will be approved for that use. All other herbicides to be used for the control of undesirable species onsite will be approved for that use. All chemicals will be applied by Wisconsin State-licensed commercial that are certified for specific categories (i.e. 5.0 - Aquatic & Mosquito, 1.1 - Field Crops & Vegetables/6.0 – Right-of-Way & Natural Areas).

Herbicides will be mixed with water, surfactants, oils, fuels, anti-foaming agents, tackifiers, dyes, and/or drift control agents to achieve desired results as specified by the manufacturer and in accordance with all applicable regulations.

Herbicide Application Data Forms will be filled out daily as chemical control methods are utilized. The site will be posted prior/after each chemical application with RES company treatment signs indicating where and when treatments took place. For any work involving herbicide applications, a RES treatment record will be filled out. *(Please see Appendix B for the Herbicide Application Data Forms.)* Prior to any aquatic applications of herbicide RES will obtain a WI-DNR Aquatic Plant Management (APM) permit.



The types of equipment that may be used for herbicide management are backpack sprayers, spray bottles, wick applicators, Tyvek chemical suits, Nitrile chemical gloves, rubber steel-toed boots, and safety glasses.

Mowing:

The need for mechanical control may be utilized to keep undesirable species at bay to promote growth of desirable vegetation and reduce competition for live stake plantings. Mowing is a physical, non-selective activity that can be effectively implemented in the early stages of the restoration activities and is most often used during the construction and restoration phases of a project. If mowing is necessary, it will be performed as the undesirable vegetation starts to crowd and compete with the desirable vegetation.

Due to the sloping nature of the site, limited equipment will be used for mowing. Prevention of the establishment of invasive woody vegetation will be the primary focus and will require the use of brush saws and weed whips.

Manual Controls:

Multiple hand tools may be used in place of chemical treatment or mowing depending on site conditions and treatment size of areas. This includes, but would not be limited to cutting, collecting and disposal of undesirable species seed heads. All materials collected and removed from site will be disposed of through proper means being careful to not spread collected invasive species seed.

Additional Notes:

- One legacy wetland that was not impacted during construction will be treated with herbicide in the spring of the first maintenance year to control and prevent the spread of reed canary grass into the surrounding restoration area. It will be reseeded in the fall to prevent reestablishment of RCG.
- RES will follow all applicable safety regulations and guidelines of federal, state, and local jurisdictions, all applicable OSHA safety regulations and guidelines, and Federal Construction Safety and Health Standards while carrying out activities related to the project.
- The following safety equipment will be available at all times onsite for personnel: first aid kit, portable emergency eyewash, chemical spill kit, fire extinguisher, Material Safety Data Sheets, and appropriate PPE.



- All handling of materials and non-native species management will comply with the guidance provided in the Wisconsin Natural Resources Code 40 (Chapter NR 40).

2. Turf Management

All restored turf will be maintained by the site owner. If reseeding is required, RES will complete that work until a satisfactory stand of turf has established until end of warranty period.

3. Watering

Watering will be done as needed to maintain vegetation health. In the event of extreme drought, temporary irrigation systems may be installed.

4. Replacements

The contractor will work with the owner's representative to meet the performance standards outlined in the specifications. A site visit will be scheduled in the fall of year 1 with the project engineer to determine what replanting of live stakes, if any, is required. The contractor has the right to agree or disagree with replacements and offer alternative resolutions. Any agreed upon replacements will be installed during the next appropriate planting date as outlined in the specifications. Planting windows may be from April 1st to June 1st and October 1st to November 30th. Consideration for these replanting periods will be given for site conditions and weather. Replacement live stakes will be negotiated to determine what species are best suited for the site conditions. Some species may find the soil conditions on site to be more suitable than others and RES would like to plant more of the successful replacement species and have the option to remove replacement species that have shown poor survivability due to site conditions.

Replacements will occur:

- If bare areas larger than 25 square feet exist within native seeding areas.
- If vegetation is not in healthy condition, as determined by owner's representative and contractor.
- If large areas of live stakes are deemed unsuccessful.



Exclusions:

The contractor is not liable for replacement costs to seeds and plants damaged by extreme weather conditions (severe droughts/floods), plants not installed by the contractor, plants relocated or removed by others, acts of God, losses because of curtailment of water by local authorities, or damage by vandalism. Vegetation management is for the contracted bid items and applicable change order plantings only.

The restoration area will be clearly marked and the contractor requests that all service work adjacent to the project site avoid entering or interfering with the restoration area. For example, the plowing of snow from adjacent lots into the restoration area may result in soil scraping of topsoil and seeds or covering seeded area with gravel and debris. Such damage is not at fault of the contractor and may result in additional costs to the client for repairs. Additionally, all debris placed within the restoration site by others shall be removed at the request of RES at no cost to the contractor. Any damages associated with debris or materials placed within the site are not the responsibility of RES and warranty of those areas are void.

5. Erosion and Surface Repairs

Repairs that result from insufficient vegetation coverage or inappropriate or inadequate maintenance shall be repaired by the vegetation contractor at no additional expense to the owner. The contractor shall report and repair washed out areas within 24 hours of discovery by means of providing and installing new topsoil, seed, and surface fabric consistent to the project requirements.

REPORTING

1. Maintenance Logs

Maintenance logs will be filled out by the maintenance crews for every trip that occurs to the site, detailing specific areas and what activity occurred (herbicide treatment, mowing, watering, reseeding, replanting, tree and shrub condition, etc.) The maintenance logs will be sent to the owner's representative/engineer within a week of the site visit.

Please see Appendix A for a copy of this log.



2. Pesticide Application Forms

All pesticide treatments will be recorded on a form, detailing the target area, type and amount of chemical used, and the target species. Maintenance crews will be recording this information. A copy of the pesticide application forms will be sent to the owner's representative/engineer within 30 days of application.

Please see Appendix B for a copy of these forms.

3. Annual Vegetation Establishment Report

At the end of each growing season, beginning in the fall of 2022 and ending in the fall of 2024, an annual vegetation report will be submitted to the owner's representative within 30 days of final vegetation treatment for that season. This report will provide a summary of establishment maintenance logs with copies of reports, summary of vegetation control methods with schedule of operations, summary of removal of undesirable vegetation, summary of correspondence for the reporting period, summary of contacts and proposed work to take place during the next reporting period.

4. Post Storm Inspection Report

Within the first three days after a storm event over 0.5" of rainfall within the watershed or within 24 hours of contact by owner's representative a post storm inspection will be conducted. The inspection will note location, site damages resulting from rain event, repair needs and priority, and estimated cost to repair if outside of contract scope. Inspection reports will be returned to owner, who will determine extent of any repairs to be performed under the maintenance contact.

Please see Appendix C for a copy of the Post Storm Inspection Report.



629 S 89th Street
Milwaukee, WI 53214

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

APPENDICES

Appendix A. Maintenance Log



VEGETATION MAINTENANCE LOG

Project: _____ Client: _____

By: _____ Date: _____ Time: _____

RES Project Number: _____

Invasive Species Control:

Irrigation:

Erosion Repairs:

Replacements/Replanting:

Pest Control/Herbivory Fence:

Damage by Others:

Completed by:

Date:

Copies: ☐ Owner ☐ A/E ☐ Contractor ☐ Consultants ☐ _____ ☐ _____ ☐ File



629 S 89th Street
Milwaukee, WI 53214

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

Appendix B. Herbicide Application Data Forms



RES Great Lakes

17921 Smith Road, P.O. Box 256 Brodhead, WI 53520
Phone: (608) 897-8641 • Fax: (608) 897-2044
Email: res.us

SPECIALISTS IN ENVIRONMENTAL MANAGEMENT AND RESEARCH

HERBICIDE APPLICATION DATA FORM

DATE: _____ PROJECT MANAGER: _____

PROJECT NAME: _____ PROJECT #: _____

PROJECT LOCATION: (City, State) _____

APPLICATOR(S) NAME: _____

APPLICATOR(S) LICENSE #: _____

START TIME: _____ END TIME: _____ LABOR HOURS: _____

DESCRIPTION/LOCATION OF AREA TREATED (or as indicated on map): _____

VEGETATION TREATED: _____

CAUTION SIGNAGE PLACED: _____ REENTRY PERIOD: _____ MIXED LOAD SITE MAPPED: _____

☒	Equipment Used	☒	Method Used
	Backpack Sprayer		Spot Spray
	Glove Applicator		Broadcast Spray
	Hand Sprayer		Wick Application
	Wick Applicator		Stump Treat
	Tractor Sprayer		Other: _____
	Polaris Sprayer		Other: _____

PRODUCT INFORMATION

Product Name	Spray Volume	Manufacturer	% a.i.	EPA#	Amount Used	Application Rate
RoundUp Custom		Monsanto	53.8%	524-343		
Garlon 3A		Dow	44.4%	62719-037		
Milestone		Dow	40.6%	62719-519		
Escort		Bayer	60%	432-1549		

WEATHER CONDITIONS: DIRECTION & WIND SPEED: _____ TEMPERATURE: _____ HUMIDITY: _____

(Please check one)

CLEAR: _____ PARTLY CLOUDY: _____ CLOUDY: _____

DID IT RAIN WITHIN 12 HOURS AFTER APPLICATION? _____ YES, if so, when: _____

NOTES/COMMENTS: _____

*Product Labels and MSDS sheets are available by request free of charge
Revised 2-15-07



629 S 89th Street
Milwaukee, WI 53214

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

Appendix C. Post Storm Inspection Report



Stormwater Construction Site Inspection Report

Project Name: _____

Inspection Date: _____ Inspection Time: _____

Inspector: _____

Type of Inspection: _____

Weather Information		
Has there been a storm event since the last inspection?		
Storm Date/Time:	Storm Duration (hrs):	Approx. Precipitation Qty (in):
Weather at time of this inspection?		Temperature:
Comments:		

Site Specific BMPs			
BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes:
1	Are sediment trapping structures in place and functioning?		
2	Have all disturbed areas been stabilized?		
3	Has permanent or temporary seeding been established?		



629 S 89th Street
Milwaukee, WI 53214

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

4	Are finished slopes adequately stabilized?
5	Are adequate measures installed to protect and stabilize streambanks?
6	Is necessary rehabilitation of in-stream construction complete?
7	Have all temporary control structures been removed?
8	Do any areas previously seeded require maintenance? (fertilizer, reseeding, or weed control)
9	Is there evidence of sediment leaving site, affecting downstream property?
10	Are there signs of damage to installed trees/shrubs?

Additional Notes/Comments



629 S 89th Street
Milwaukee, WI 53214

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

Appendix D. Herbicide List for Use on Rubicon River Project

Product Name	Manufacturer	% a.i.	EPA#
RoundUp Custom	Monsanto	53.8%	524-343
RODEO	Dow	53.7%	62719-324
Garlon 3A	Dow	44.4%	62719-037
Milestone	Dow	40.6%	62719-519
Escort	Bayer	60%	432-1549
Polaris AC	Nufarm	54.7%	228-570

*Additional herbicide types may be submitted for approval once maintenance period has begun.

Maintenance Log



VEGETATION MAINTENANCE LOG

Project: Rubicon Streambank Stabilization

Client: _____

By: Deanna Nickey

Date: 6/15/23 Time: 5:30 pm

RES Project Number: 105035

Invasive Species Control:

Herbicide application to Thistle spp. and Reed canary grass.

Mowing and/or hand-pulling of mustard spp., Dames Rocket, Sweet Clover, Ragweed spp., Wormwood, Velvet leaf, Sow Thistle and Horseweed

Irrigation:

N/A

Erosion Repairs:

N/A

Replacements/Replanting:

Pest Control/Herbivory Fence:

Damage by Others:

Completed by: Deanna Nickey

Date: 6/15/23

Copies: ☐ Owner ☐ A/E ☐ Contractor ☐ Consultants ☐ _____ ☐ _____ ☐ File



HERBICIDE APPLICATION DATA FORM

PROJECT NAME: Rubicon PROJECT #: 105035

PROJECT LOCATION: Rubicon PROJECT MANAGER: Deanna Nickey

CITY: Rubicon STATE: WI ZIP: 53078

APPLICATOR(S) NAME: Matt Blechacz CERTIFICATION #: 109244

APPLICATION DATE: 6 / 15 / 23 START TIME: 9 : 00 END TIME: 11 : 00 LABOR HOURS: 2

DESCRIPTION/LOCATION OF AREA TREATED (or as indicated on map):

Whole Site

VEGETATION TREATED:

Reed Canary Grass, Thistle

CAUTION SIGNAGE PLACED: X REENTRY PERIOD: 48 hours MIXED LOAD SITE MAPPED: X

☒	Equipment Used	☒	Method Used
<u>X</u>	Backpack Sprayer	<u>x</u>	Spot Spray
	Glove Applicator		Broadcast Spray
	Hand Sprayer		Wick Application
	Wick Applicator		Stump Treatment
	Wand Applicator		Other:
	Polaris Sprayer		Other:

PRODUCT INFORMATION

Product Name	Spray Volume	Manufacturer	% a.i.	EPA#	Amount Used	Application Rate
Garlon 3A		Dow	44.4	62719-037		
RoundUp Custom	<u>2</u>	Monsanto	53.8	524-343	<u>12 oz</u>	<u>6 oz./gal.</u>
Milestone		Dow	40.6	62719-519		
Polaris AC		NuFarm	53.1	228-480		
Escort		Bayer	60	432-1549		

WEATHER CONDITIONS (please check one):

DIRECTION & WIND SPEED: 11 mph N TEMPERATURE: 62 F HUMIDITY: 58%

CLEAR: _____ PARTLY CLOUDY: _____ CLOUDY: X

DID IT RAIN WITHIN 12 HOURS AFTER APPLICATION? _____ YES, If so, when: _____

X NO

NOTES/COMMENTS: _____

*Product Labels and SDS's sheets are available by request free of charge.



VEGETATION MAINTENANCE LOG

Project: Rubicon Client: _____
By: Ben Michq Date: 8-21-23 Time: 8:00 - 12:00
RES Project Number: 105035

Invasive Species Control:

Queen Annes Lace, Reed Canary Grass, Thistle, Sweet Clover
Bird's foot Trefoil, Burdock.
Mowed and applied herbicide

Irrigation:

None

Erosion Repairs:

None

Replacements/Replanting:

None

Pest Control/Herbivory Fence:

None

Damage by Others:

Completed by: Ben Michq Date: 8-21-23

Copies: ☐ Owner ☐ A/E ☐ Contractor ☐ Consultants ☐ _____ ☐ _____ ☐ File



HERBICIDE APPLICATION DATA FORM

PROJECT NAME: Rubicon PROJECT #: 105035

PROJECT LOCATION: Hartford PROJECT MANAGER: Deanna Nickey

CITY: Hartford STATE: WI ZIP: 53027

APPLICATOR(S) NAME: Mark Engel CERTIFICATION #: 103210

APPLICATION DATE: 08 / 21 / 2023 START TIME: 8 : 00 END TIME: 12 : 00 LABOR HOURS: 4

DESCRIPTION/LOCATION OF AREA TREATED (or as indicated on map):

Whole site

VEGETATION TREATED:

RCG, thistles, burdock, birdsfoot trefoil

CAUTION SIGNAGE PLACED: X REENTRY PERIOD: 48 hours MIXED LOAD SITE MAPPED: X

✓	Equipment Used	✓	Method Used
X	Backpack Sprayer	x	Spot Spray
	Glove Applicator		Broadcast Spray
	Hand Sprayer		Wick Application
	Wick Applicator		Stump Treatment
	Wand Applicator		Other:
	Polaris Sprayer		Other:

PRODUCT INFORMATION

Product Name	Spray Volume	Manufacturer	% a.i.	EPA#	Amount Used	Application Rate
Garlon 3A		Dow	44.4	62719-037		
RoundUp Custom	1 gal	Monsanto	53.8	524-343	6 oz	6 oz / gal
Milestone	1 gal	Dow	40.6	62719-519	1/3 oz / gal	1/3 oz.
Polaris AC		NuFarm	53.1	228-480		
Escort		Bayer	60	432-1549		

WEATHER CONDITIONS (please check one):

DIRECTION & WIND SPEED: E 6mph TEMPERATURE: 79 F HUMIDITY: 57%

CLEAR: _____ PARTLY CLOUDY: _____ CLOUDY: _____

DID IT RAIN WITHIN 12 HOURS AFTER APPLICATION? _____ YES, If so, when: _____

X NO

NOTES/COMMENTS: _____

*Product Labels and SDS's sheets are available by request free of charge.



HERBICIDE APPLICATION DATA FORM

PROJECT NAME: Rubicon PROJECT #: 105035

PROJECT LOCATION: Hartford PROJECT MANAGER: Deanna Nickey

CITY: Hartford STATE: WI ZIP: 53027

APPLICATOR(S) NAME: Karl Pawinski, Anthony Ritger CERTIFICATION #: 110800, 114402

APPLICATION DATE: 6 / 13 / 2024 START TIME: 1 : 30 END TIME: 2 : 30 LABOR HOURS: 1

DESCRIPTION/LOCATION OF AREA TREATED (or as indicated on map):

Whole site

VEGETATION TREATED:

RCG, thistles, burdock, birdsfoot trefoil, mullein

CAUTION SIGNAGE PLACED: X REENTRY PERIOD: 48 hours MIXED LOAD SITE MAPPED: X

✓	Equipment Used	✓	Method Used
X	Backpack Sprayer	x	Spot Spray
	Glove Applicator		Broadcast Spray
	Hand Sprayer		Wick Application
	Wick Applicator		Stump Treatment
	Wand Applicator		Other:
	Polaris Sprayer		Other:

PRODUCT INFORMATION

Product Name	Spray Volume	Manufacturer	% a.i.	EPA#	Amount Used	Application Rate
Garlon 3A		Dow	44.4	62719-037		
RoundUp Custom	3 gal	Monsanto	53.8	524-343	6 oz	18 oz / gal
Milestone	2 gal	Dow	40.6	62719-519	1/3 oz / gal	2/3 oz.
Polaris AC		NuFarm	53.1	228-480		
Escort		Bayer	60	432-1549		

WEATHER CONDITIONS (please check one):

DIRECTION & WIND SPEED: W 12mph TEMPERATURE: 80 F HUMIDITY: 51%

CLEAR: _____ PARTLY CLOUDY: _____ CLOUDY: X

DID IT RAIN WITHIN 12 HOURS AFTER APPLICATION? _____ YES, If so, when: _____

X _____ NO

NOTES/COMMENTS: _____

*Product Labels and SDS's sheets are available by request free of charge.



HERBICIDE APPLICATION DATA FORM

PROJECT NAME: Rubicon PROJECT #: 105035

PROJECT LOCATION: Hartford PROJECT MANAGER: Deanna Nickey

CITY: Hartford STATE: WI ZIP: 53027

APPLICATOR(S) NAME: Hailey Hughes CERTIFICATION #: 117808

APPLICATION DATE: 9 / 18 / 2024 START TIME: 8 : 30 END TIME: 10 : 00 LABOR HOURS: 1.5

DESCRIPTION/LOCATION OF AREA TREATED (or as indicated on map):

Whole site

VEGETATION TREATED:

RCG

CAUTION SIGNAGE PLACED: X REENTRY PERIOD: 48 hours MIXED LOAD SITE MAPPED: X

✓	Equipment Used	✓	Method Used
X	Backpack Sprayer	x	Spot Spray
	Glove Applicator		Broadcast Spray
	Hand Sprayer		Wick Application
	Wick Applicator		Stump Treatment
	Wand Applicator		Other:
	Polaris Sprayer		Other:

PRODUCT INFORMATION

Product Name	Spray Volume	Manufacturer	% a.i.	EPA#	Amount Used	Application Rate
Garlon 3A		Dow	44.4	62719-037		
RoundUp Custom	1 gal	Monsanto	53.8	524-343	6 oz	6 oz / gal
Milestone		Dow	40.6	62719-519		
Polaris AC		NuFarm	53.1	228-480		
Escort		Bayer	60	432-1549		

WEATHER CONDITIONS (please check one):

DIRECTION & WIND SPEED: ESE 8 mph TEMPERATURE: 80 F HUMIDITY: 52%

CLEAR: _____ PARTLY CLOUDY: _____ CLOUDY: X

DID IT RAIN WITHIN 12 HOURS AFTER APPLICATION? _____ YES, If so, when: _____

X _____ NO

NOTES/COMMENTS: _____

*Product Labels and SDS's sheets are available by request free of charge.

Photo Logs

Slinger Water Quality Trading Plan Update 2025 Photo Log



Photos of Rubicon River, between Wacker Drive and Grant Street, facing North

Date: 6/11/2024



Slinger Water Quality Trading Plan Update 2025 Photo Log



Photos of Rubicon River, between Wacker Drive and Grant Street, facing North

Date: 6/11/2024



Slinger Water Quality Trading Plan Update 2025 Photo Log



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Slinger Water Quality Trading Plan Update 2025 Photo Log



Photos of Rubicon River, between Wacker Drive and Grant Street, facing North

Date: 6/11/2024





Figure 1: Fish Habitat on Rubicon



Figure 2: Fish Habitat on Rubicon



Figure 3: Fish Habitat on Rubicon



Figure 4: Fish Habitat on Rubicon



Figure 5: Fish Habitat on Rubicon



Figure 6: Fish Habitat on Rubicon



Figure 7: Fish Habitat on Rubicon

Appendix E

Water Quality Trading Management Practice Registration Form

**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 Village of Slinger	Permit Number WI- 0020290-10-0	Facility Site Number	
Facility Address 120 MBW Road	City Slinger	State WI	ZIP Code 53086
Project Contact Name (if applicable) Greg Moser	Address 120 MBW Road	City Slinger	State WI
ZIP Code 53086			
Project Name City of Hartford Water Quality Trade			

Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ☐ Yes
☒ No

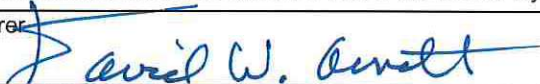
Broker/Exchange Organization Name	Contact Name	
Address	Phone Number	Email

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	WQT-2020-0001	Streambank stabilization	61.6	2.4	Modeling SNAP PLUS
County Washington	Closest Receiving Water Name Rubicon River		Land Parcel ID(s) See WQT Plan	Parameter(s) being traded Total phosphorus	

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 3/23/23
--	------------------------

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	

Attachment 1

Water Quality Trading Plan Checklist

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 Slinger Wastewater Treatment Facility		Permit Number WI- 0020290		Facility Site Number 5823	
Facility Address 120 MBW Road			City Slinger	State WI	ZIP Code 53086
Project Contact Name (if applicable) Greg Moser		Address 300 Slinger Rd.		City Slinger	State WI
				State WI	ZIP Code 53086
Project Name Village of Slinger Water Quality Trading Plan					
Receiving Water Name Unnamed Trib to Rubicon River		Parameter(s) being traded Total Phosphorus		HUC 12(s) 070900010302	

Credit Generator Information

Credit generator type (select all that apply):

☐ Permitted Discharge (non-MS4CAFO)	☒ Urban nonpoint source discharge
☐ Permitted MS4	☐ Agricultural nonpoint source discharge
☐ Permitted CAFO	☐ 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 WPDES 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				

Water Quality Trading Checklist

Form 3400-208 (1/14)

Page 2 of 3

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	TBD	☐ 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 2
b. Management practices used to generate credits ☒ Yes ☐ No	Section 2
c. Amount of credit being generated ☒ Yes ☐ No	Section 3
d. Description of applicable trade ratio per agreement/management practice ☒ Yes ☐ No	Section 4
e. Location where credits will be generated ☒ Yes ☐ No	Section 2
f. Timeline for credits and agreements ☒ Yes ☐ No	Section 6
g. Method for quantifying credits ☒ Yes ☐ No	Section 2-3

Water Quality Trading Checklist

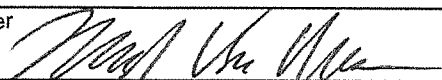
Form 3400-208 (1/14)

Page 3 of 3

Does plan have a narrative that describes:		Plan Section
h. Tracking procedures	☒ Yes ☐ No	Section 5
i. Conditions under which the management practices may be inspected	☒ Yes ☐ No	Section 5
j. Reporting requirements should the management practice fail	☒ Yes ☐ No	Section 5
k. Operation and maintenance plan for each management practice	☒ Yes ☐ No	Section 5
l. Location of credit generator in proximity to receiving water and credit user	☒ Yes ☐ No	Section 2
m. Practice registration documents, if available	☐ Yes ☒ No	
n. History of project site(s)	☒ Yes ☐ No	Section 2
o. Other: _____	☐ Yes ☐ No	

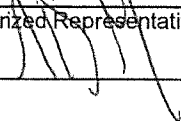
The preparer certifies all of the following:

- 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 05/03/2019
---	------------------------

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 5/3/19
--	--------------------

Attachment 2

Engineering Plan Set

**RUBICON RIVER STREAMBANK
STABILIZATION - IN CITY OF HARTFORD**

VILLAGE OF SLINGER

WASHINGTON COUNTY, WISCONSIN

**VILLAGE OF SLINGER
WASHINGTON COUNTY, WISCONSIN**

SHEET INDEX

DESCRIPTION	SHEET NO.
GENERAL NOTES	05
TREE CLEARING PLAN	06 & 17
PROPOSED EROSION CONTROL PLAN	08 TO 10
PROPOSED STREAMBANK STABILIZATION PLAN	
PROPOSED RESTORATION PLAN	
CONSTRUCTION DETAILS	
RUBICON RIVER CROSS SECTIONS	

LEGEND - CIVIL ENGINEERING DRAWINGS

[illegible]

CHECKED BY:

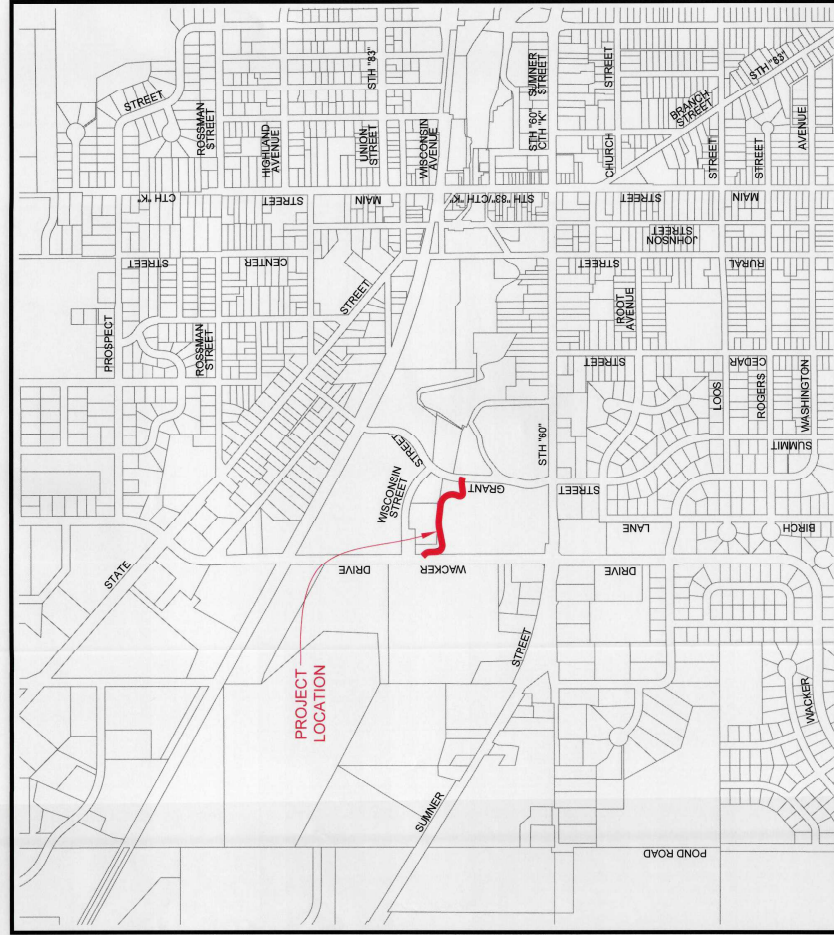


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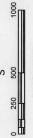
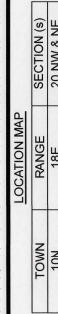
Waukesha • Kenosha • Madison
Global Water Center • Fox Valley

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PROJECT NUMBER: 18-10010 200



ORIGINAL PLAN SET
IS IN COLOR



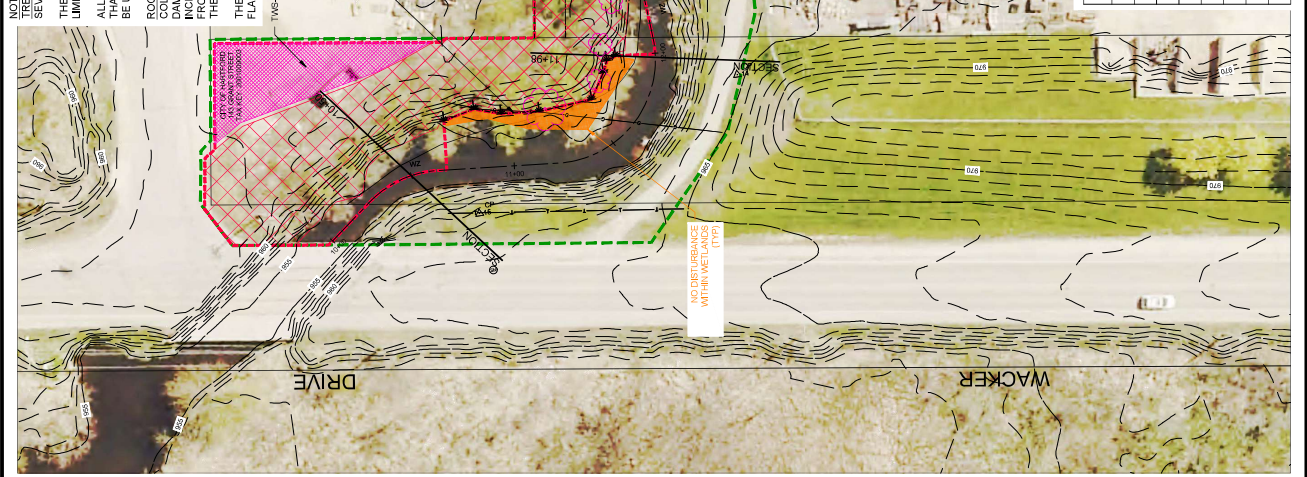
SCALE IN FEET
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PROJECT NUMBER: 18-10010 200

1. POST WDNR CERTIFICATE OF PERMIT COVERAGE ON SITE AND MAINTAIN UNTIL CONSTRUCTION ACTIVITIES HAVE CEASED, THE SITE IS STABILIZED, AND A NOTICE OF TERMINATION IS FILED WITH WDNR.

2. KEEP A COPY OF THE CURRENT EROSION CONTROL PLAN ON SITE THROUGHOUT THE DURATION OF THE PROJECT.
3. PLAN REVISIONS OR AMENDMENTS ONLY ALLOWED WITH ENGINEER'S APPROVAL. WDNOR APPROVAL REQUIRED PRIOR TO FIELD IMPLEMENTATION FOR CHAPTER 30 APPROVED PROJECTS.
4. OWNER IS RESPONSIBLE FOR ROUTINE SITE INSPECTIONS AT LEAST ONCE EVERY 7 DAYS AND WITHIN 24 HOURS AFTER A RAINFALL EVENT OF 0.5 INCHES OR GREATER. CONTRACTOR SHALL REPAIR DEFICIENT EROSION AND SEDIMENT CONTROL MEASURES WITHIN 24 HOURS AFTER INSPECTION. KEEP INSPECTION REPORTS ON-SITE AND MAKE THEM AVAILABLE UPON REQUEST.
5. INSPECT AND MAINTAIN ALL INSTALLED EROSION CONTROL PRACTICES UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
6. WHEN POSSIBLE PRESERVE EXISTING VEGETATION (ESPECIALLY ADJACENT TO SURFACE WATERS). MINIMIZE LAND-DISTURBING CONSTRUCTION ACTIVITY ON SLOPES OF 20% OR MORE. MINIMIZE SOIL COMPACTION AND PRESERVE TOPSOIL.
7. FOLLOW 01 57 13 AND REFER TO THE WDNOR STORMWATER CONSTRUCTION TECHNICAL STANDARDS AT http://dnr.wa.gov/topic/stormwater/standards/consol_standards.html.
8. INSTALL PERIMETER EROSION CONTROL BARS AND ROCK TRAPPING PAD CONSTRUCTION ENTRANCES PRIOR TO ANY LAND-DISTURBING ACTIVITIES, INCLUDING CLEARING AND GRUBBING. USE WDNOR TECHNICAL STANDARD STONE TRAPPING PAD AND THE WASHING #1087 FOR ROCK CONSTRUCTION ENTRANCES.
9. GRADE CONSTRUCTION GRADING ACTIVITIES TO MINIMIZE THE CUMULATIVE EXPOSED AREA. CONDUCT TEMPORARY GRADING FOR EROSION CONTROL PER WDNOR TECHNICAL STANDARD TEMPORARY GRADING PRACTICES FOR EROSION CONTROL #1067. MAINTAIN SITE DRAINAGE AT ALL TIMES DURING CONSTRUCTION.
10. PERMITTING OF GROUNDWATER DEWATERING IS THE RESPONSIBILITY OF CONTRACTOR. GROUNDWATER DEWATERING IS SUBJECT TO A DNR WASTEWATER DISCHARGE PERMIT AND A DNR HIGH-CAPACITY WELL APPROVAL. IF CUMULATIVE PUMP CAPACITY IS 75 GPM OR MORE.
11. PROVIDE ANTI-SLOUGH PROTECTION AND MAINTAIN NON-EROSIVE FLOW DURING DEWATERING. PERFORM DEWATERING OF ACCUMULATED SURFACE RUNOFF IN ACCORDANCE WITH WDNOR TECHNICAL STANDARD DEWATERING #1061.
12. INSTALL AND MAINTAIN SILT FENCING PER WDNOR TECHNICAL STANDARD SILT FENCE #1056. REMOVE SEDIMENT FROM BEHIND SILT FENCES AND SEDIMENT BARRIERS BEFORE SEDIMENT REACHES A DEPTH THAT IS EQUAL TO ONE-HALF OF THE FENCE AND/OR BARRIER HEIGHT.
13. REPAIR BREAK AND GAPS IN SILT FENCES AND BARRIERS IMMEDIATELY. REPLACE DECOMPOSING STRAW BALES (TYPICAL BALE LIFE IS 3 MONTHS), LOCATE, INSTALL, AND MAINTAIN STRAW BALES PER WDNOR TECHNICAL STANDARD DITCH CHECKS #1062.
14. IMMEDIATELY STABILIZE STOCKPILES AND SURROUNDING STOCKPILES AS NEEDED WITH SILT FENCE OR OTHER PERIMETER CONTROL. IF STOCKPILES WILL REMAIN INACTIVE FOR 7 DAYS OR LONGER.
15. IMMEDIATELY STABILIZE ALL DISTURBED AREAS THAT WILL REMAIN INACTIVE FOR 14 DAYS OR LONGER. FOLLOW 01 57 13 FOR LATE SEASON STABILIZATION AFTER SEPTEMBER 15TH.
16. STABILIZE AREAS OF FINAL GRADING WITHIN 7 DAYS OF REACHING FINAL GRADE.
17. SWEEP/CLEAN UP ALL SEDIMENT/TRASH THAT MOVES OFF-SITE DUE TO CONSTRUCTION ACTIVITY OR STORM EVENTS BEFORE THE END OF THE SAME WORKDAY OR AS DIRECTED BY OWNER & ENGINEER. SEPARATE WASTE MATERIALS (SOILS & TRASH) AND DISPOSE OF APPROPRIATELY.
18. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST PER WDNOR TECHNICAL STANDARD DUST CONTROL ON CONSTRUCTION SITES #1068.
19. PROPERLY DISPOSE OF ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, OR OTHER CONSTRUCTION MATERIALS) AND DO NOT ALLOW THESE MATERIALS TO BE CARRIED BY RUNOFF INTO THE RECEIVING CHANNEL.
20. FOR NON-CHANNELIZED FLOW ON DISTURBED OR CONSTRUCTED SLOPES PROVIDE EROSION CONTROL MATTING FOLLOWING SPECIFICATIONS. INSTALL AND MAINTAIN PER WDNOR TECHNICAL STANDARD CHANNEL EROSION MAT #1063.
21. MAKE PROVISIONS FOR WATERING, FOLLOW 32 00 00 FOR PERMANENT RESTORATION. FOLLOW WDNOR TECHNICAL STANDARD SEED FOR CONSTRUCTION SITE EROSION CONTROL #1069 FOR TEMPORARY SEEDING.
22. INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES IF NECESSARY OR AS DIRECTED BY OWNER OR ENGINEER.
23. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE WDNOR REMEDIATION AND WASTE MANAGEMENT REQUIREMENTS FOR HANDLING AND DISPOSING OF CONTAMINATED MATERIALS.

Prescriptive Compliance Areas	Bare Soil	Slope & Channel Management	Periods of Inactivity	Final Grade
Soil stockpiles that will exist for more than 7 days	Areas that Do Not Drain to Sediment Basins or Traps Limit the duration of soil exposure to no more than 30 days.	<u>General</u> Design and implement approved soil stabilization practices per DNR technical standards.	<u>Planned Inactivity</u> Stabilize immediately if area will be left inactive for more than 14 days.	<u>Permanent Features</u> Stabilize area immediately after reaching final grade.
Utility trench backfills	Areas that Drain to Sediment Basins or Traps Limit the duration of soil exposure to no more than 30 days. However, use the duration from the soil loss and sediment discharge calculations for the other areas of the site if less than 30 days.	Refer to WisDOT Slope & Channel Matrices for appropriate slope and slope length conditions. <u>Slopes Steeper than 20%</u> Provide stable diversion of off-site runoff around the slope.	<u>Unplanned Inactivity</u> Stabilize area immediately if period of inactivity reaches 14 days.	<u>Temporary Features</u> Stabilize area immediately after establishment of temporary feature or reaching specified temporary grade.
Temporary ditches/swales that will exist for more than 7 days				
Permanent ditches/swales				
Small areas – Less than 1 acre and less than 1% of site				
Discrete areas – Less than 1 acre		Provides slope interruption in accordance with Manufactured Perimeter Control & Slope Interruption Products Technical Standard 1071 or equivalent methods to reduce uninterrupted slope length.		
Storm water practice side slopes				
Slopes steeper than 20%				



NOTES:
TREES TO REMAIN:
SEVEN TREES WERE IDENTIFIED THAT WILL REMAIN ON SITE. THESE WILL BE FLAGGED IN THE FIELD BY THE OWNER. THESE WILL BE FLAGGED AS PINK. FLAGGING LOCATIONS ARE DENOTED BELOW.

ALL NATIVE TREES (EXCLUDING NON-NATIVE AND INVASIVE) GREATER THAN 4" DBH THAT WILL BE REMOVED AS PART OF THE PROJECT WITHIN 35 FT OF THE OHMM SHALL BE USED DURING CONSTRUCTION. STOCKPILE APPROPRIATELY.

ROOT WAD TREE COLLECTION:
COLLECT ROOT WADS FROM FORESTED AREAS BEING CLEARED. BE CAREFUL TO AVOID DAMAGE TO ROOT WADS. ROOT WADS SHOULD BE PLUSHED OVER WADS. WADS ARE NOT BURNED. 80% - 100% BURN RATE. ROOT WADS CAN BE PLUSHED OVER WADS. WADS ARE NOT BURNED. LEAVING ROOT FANS INTACT. THE TREE TOPS SHOULD BE REMOVED. LEAVING THE TRUNKS (BOLES) A MINIMUM OF 5 TO 6 FEET IN DIAMETER.

THESE WILL BE FLAGGED IN THE FIELD BY OWNER. THESE WILL BE FLAGGED AS PINK. FLAGGING LOCATIONS ARE DENOTED BELOW.

PERMANENT ACCESS AND EGRESS
BY FINDER HALLWAY ON
10/13/2020
BY FINDER HALLWAY ON
10/13/2020

GRANITE, L.L.C.
10 W. WISCONSIN STREET
P.O. BOX 2001080001
P.O. BOX 2001080002

TREE #158
TREE #170
TREE #159
TREE #172
TREE #173
TREE #154
TREE #155
TREE #156
TREE #157
TREE #158
TREE #159
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TREE #193
TREE #194
TREE #195
TREE #196
TREE #197
TREE #198
TREE #199
TREE #200

NO DISTURBANCE
WITHIN WETLANDS
TYPE

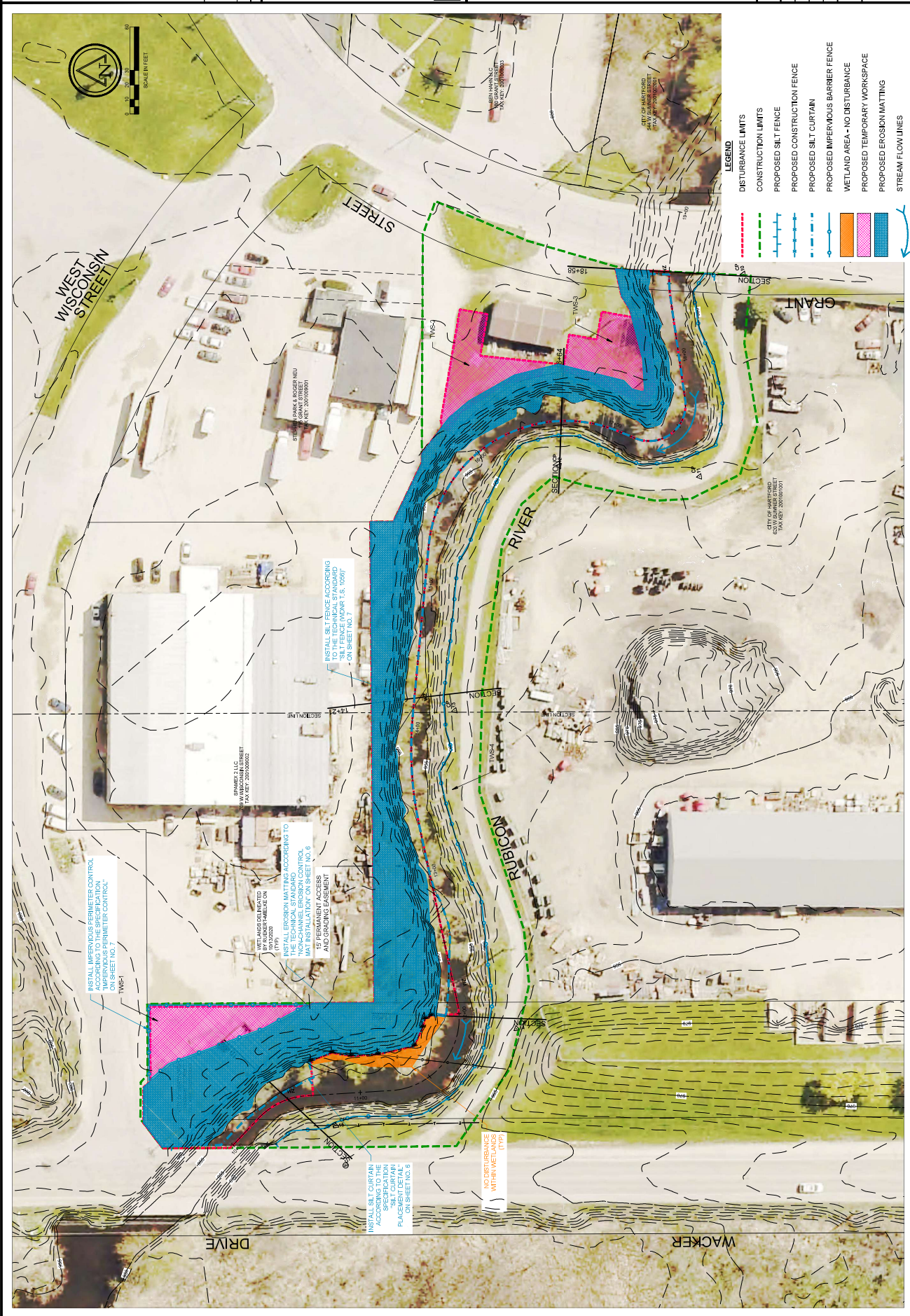
PROPOSED BASEMENT
BOUNDARY

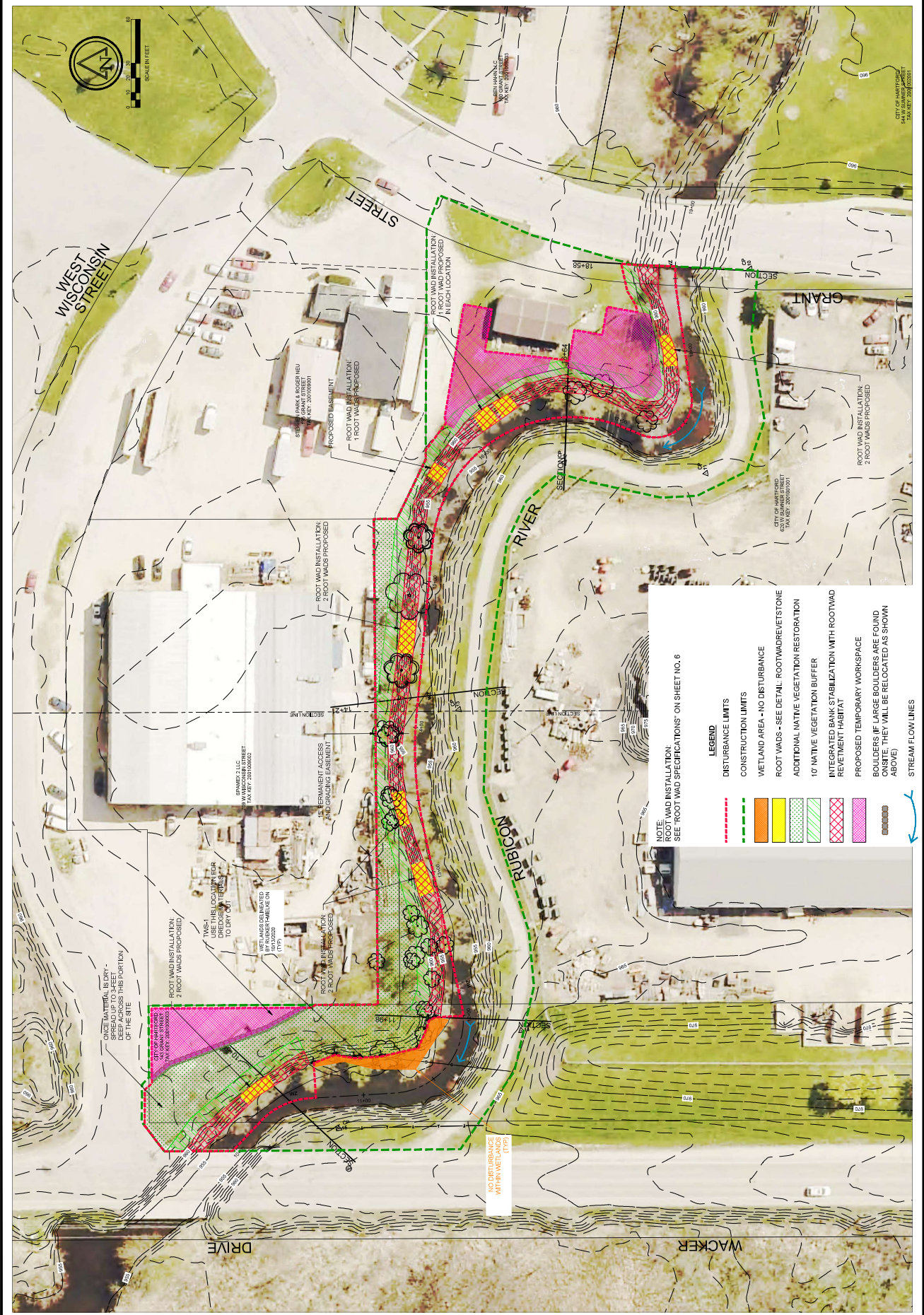
SECTION 1
SECTION 2
SECTION 3

WACKER DRIVE
GRANT STREET
RIVER
WEST WISCONSIN STREET

TREE INVENTORY			
TREE NUMBER	COMMON NAME	TREE SPECIES	KEEP/REMOVE
135	EASTERN COTTONWOOD	POPULUS DELTOIDES	KEEP
168	SILVER MAPLE	ACER SACCHARINUM	KEEP
169	SILVER MAPLE	ACER SACCHARINUM	KEEP
170	SILVER MAPLE	ACER SACCHARINUM	KEEP
172	BLACK WILLOW	SALIX NIGRA	KEEP
173	BLACK WILLOW	SALIX NIGRA	KEEP
179	SILVER MAPLE	ACER SACCHARINUM	KEEP

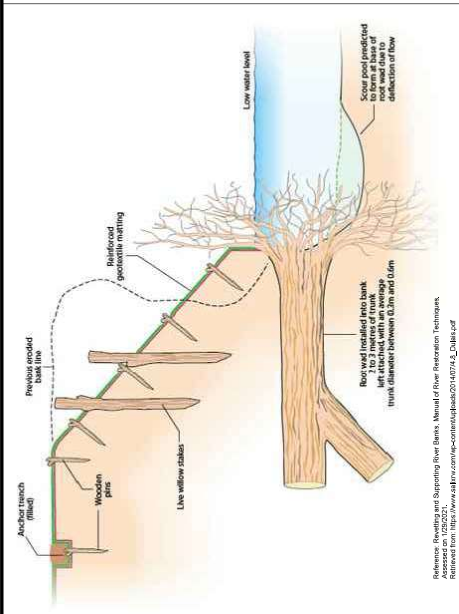
- LEGEND**
- DISTURBANCE LIMITS
 - CONSTRUCTION LIMITS
 - WETLAND AREA - NO DISTURBANCE
 - CLEARING AND GRUBBING
 - PROPOSED TEMPORARY WORKSPACE
 - TREES TO REMAIN
 - ROOT WAD TREE



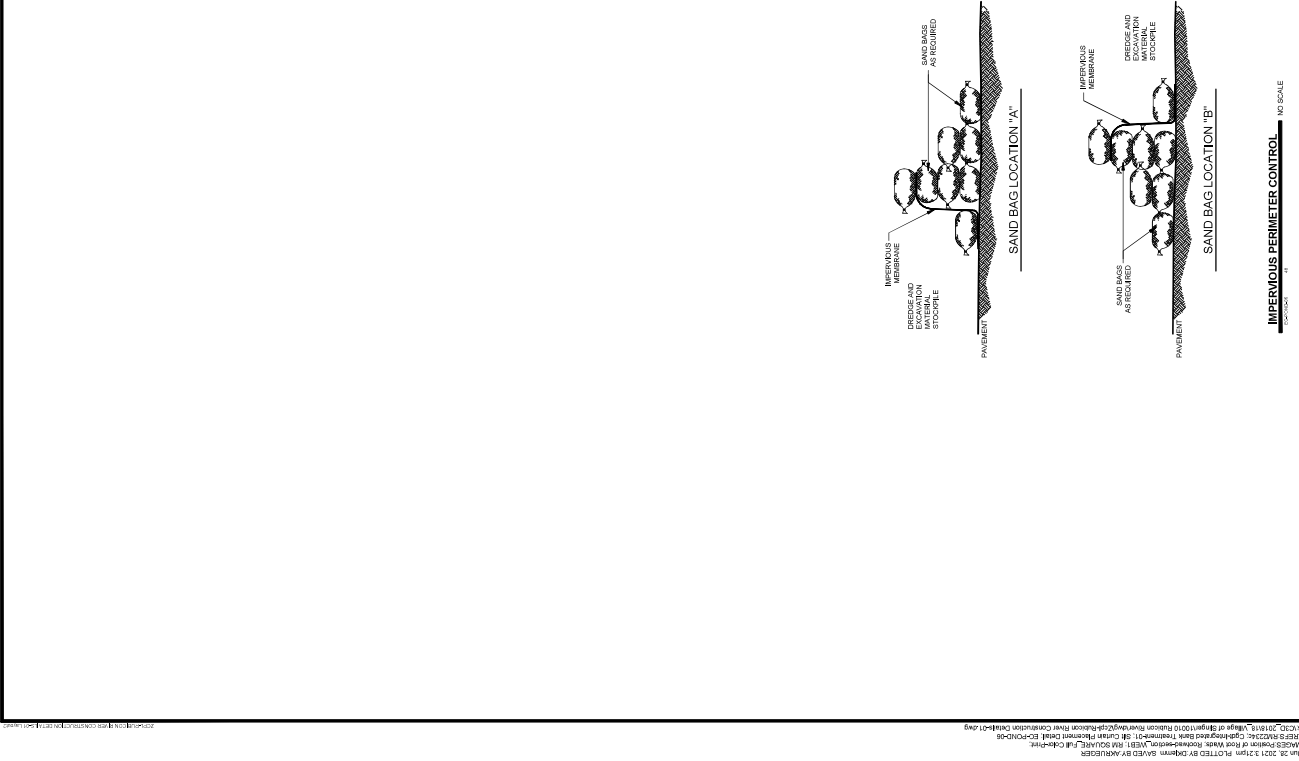


[illegible]

2019年12月30日，根据《中华人民共和国公司法》及《公司章程》的有关规定，并经2019年12月30日召开的2019年第四次临时股东大会审议通过，公司决定回购部分社会公众股份。截至2019年12月30日，公司已回购社会公众股份1,000,000股，占公司总股本的1.00%。



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Seeding (WDNR T.S. 1059)

DEFINITION
Planting seed to establish temporary/permanent vegetation for erosion control.

PURPOSE
Temporary Seeding reduces runoff and erosion until permanent vegetation or other erosion control practices can be established.
Permanent Seeding permanently stabilizes areas of exposed soil.
Nurse Crop is seeded with a permanent mix to provide fast-growing cover to protect the soil surface until permanent vegetation becomes established.

CONDITIONS WHERE PRACTICE APPLIES
Areas of exposed soil where the establishment of vegetation is desired.

- Temporary seeding: disturbed areas that will not be brought to final grade or on which land-disturbing activities will not be performed for a period greater than 30 days and requires vegetative cover for less than one year.
- Permanent seeding: where perennial vegetative cover is needed.

SEED

- Seed shall conform to WI statutes and WI Administrative Code ch. ATCP 20 regarding noxious weed seed content and labeling.
- Use seed within one year of test date appearing on the label.
- Store seed to protect it from damage by heat, moisture, rodents. Discard and replace previously tested and accepted seed that becomes damaged.

Silt Fence (WDNR T.S. 1056)

DEFINITION
Silt fence is a temporary sediment barrier of entrenched permeable geotextile fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff from small areas of disturbed soil to create ponding.

PURPOSE
Reduce slope length and intercept and retain sediment from disturbed areas.

CONDITIONS WHERE PRACTICE APPLIES
This standard applies to the following applications where:

- Erosion occurs in the form of sheet and rill erosion. There is no concentration of water flowing to the barrier (channel erosion).
- Where adjacent areas need protection from sediment-laden runoff.
- Where effectiveness is required for one year or less.
- Where conditions allow for silt fence to be properly entrenched and staked as outlined in Criteria Section V of WDNR T.S. Silt Fence (1056).

Under no circumstance shall products be used in the following applications:

- Below the ordinary high watermark or placed perpendicular to flow in streams, swales, ditches or any place where flow is concentrated.
- Where the maximum gradient upslope of the fence is >50% (2:1).
- Lettering on the fence is not permissible on WisDOT projects.
- Must have support cord.

SEEDING INSTALLATION

Seedbed Preparation

- Permanent seeding needs a seedbed of at least 4 inches of loose topsoil.
- Necessity of fertilizer application should be based on soil testing results.
- Prior to seeding, work the area being seeded with appropriate equipment to prepare a tilled fine, but firm, seedbed. Remove rocks, twigs, foreign materials, and dirt clods >2 inches diameter that cannot be broken down.

Sowing

- Apply uniformly over the seedbed at the correct seeding rate. Appropriate seed mixes should be lightly incorporated into the seedbed.

DOT Seed Mixture	Sowing Rate (pounds/1,000 square feet)
10	1.5
20	3
30	2
40	2
60	2
70 and 70A	equivalent seeding rate of 1.5
75	0.4
80	0.7
Temporary Seeding	0.8
Nurse Crop Seeding	0.8

- Seed when soil temperatures remain consistently above 53° F. Avoid seeding during periods where seedlings could be damaged or killed by frost (usually late September to early November).
- Dormant seed after November 1. Do not sow seeds over snow cover.

Seed Protection

- Protect seed using mulch (WDNR T.S. 1058) or erosion mat (WDNR T.S. 1052). Limit vehicle traffic in areas that have been permanently seeded.

INSPECTION AND MAINTENANCE

Inspect per permit requirements. Verify seed germination and vegetation establishment. Maintenance includes reapplying mulch and matting, irrigating, regrading, and reseeding.

SILT FENCE INSTALLATION

- Construct in an arc with the ends pointing upslope to avoid erosion around ends of the fence. Best installation method is static slicing. Failure to properly anchor silt fence could result in water and sediment release beneath the silt fence. It is critical to backfill and compact the trench.
- Construct from a continuous roll of geotextile to avoid joints. Where joints are necessary, overlap to the next post or wrap adjoining fabrics together around the joint post and tightly fasten.
- When not used in conjunction with other practices and when using for slope interruption, install spacing per:

Slope	Fence Spacing
<2 %	100 feet
2 - 5 %	75 feet
5 - 10 %	50 feet
10 - 33 %	25 feet
> 33 %	20 feet

This detail is an example of typical installation guidance.

RUBICON RIVER STREAMBANK STABILIZATION- IN CITY OF HARTFORD
VILLAGE OF SLINGER
WASHINGTON COUNTY, WISCONSIN

Ruekert • Mielke
www.ruekertmielke.com
Waukesha • Kenosha • Madison
Global Water Center • Fox Valley

TOWN: 10N	RANGE: 18E	SECTION(s): 20 NW & NE
1		
2		
3		
4		
5		
6		
7		

Attachment 3

Credit Usage Log

Year of Summary

Credits Available for 6-month period

2022

Data set starts in April 2022

30.8

Month	Credits Used (cumulative)	Credits Available at End of Month (pounds)
January	#REF!	#REF!
February	#REF!	#REF!
March	#DIV/0!	#DIV/0!
April	0.00	30.80
May	0.00	30.80
June	0.00	30.80
Total	0.00	30.80 Should be positive number.

Month	Credits Used (cumulative)	Credits Available at End of Month (pounds)
July	0.00	30.80
August	0.00	30.80
September	0.84	29.96
October	0.84	29.96
November	0.84	29.96
December	11.02	19.78
Total	11.02	19.78 Should be positive number.

Year of Summary

Credits Available for 6-month period

2023

30.8

Month	Credits Used (cumulative)	Credits Available at End of Month (pounds)
January	0.00	30.80
February	0.00	30.80
March	17.08	13.72
April	26.47	4.33
May	33.93	-3.13
June	33.93	-3.13
Total	33.93	-3.13 Should be positive number.

Month	Credits Used (cumulative)	Credits Available at End of Month (pounds)
July	0.07	30.73
August	0.19	30.61
September	0.19	30.61
October	0.19	30.61
November	0.19	30.61
December	0.19	30.61
Total	0.19	30.61 Should be positive number.

Year of Summary

Credits Available for 6-month period

2024

30.8

	Credits Used	Credits Available at End of Month
Month	(cumulative)	(pounds)
January	0.00	30.80
February	0.00	30.80
March	0.00	30.80
April	0.00	30.80
May	0.00	30.80
June	0.00	30.80
Total	0.00	30.80 Should be positive number.

	Credits Used	Credits Available at End of Month
Month	(cumulative)	(pounds)
July	0.00	30.80
August	0.00	30.80
September	0.00	30.80
October	0.00	30.80
November	0.00	30.80
December	0.00	30.80
Total	0.00	30.80 Should be positive number.