

Wauzeka Public Noticed Permit Fact Sheet

General Information

Permit Number	WI-0022276-11-0
Permittee	Village of Wauzeka, P O Box 344 410 East Front St, Wauzeka, WI 53826
Permitted Facility	Wauzeka Wastewater Treatment Facility, 410 East Front St., Wauzeka, WI
Permit Term	November 01, 2026 to September 30, 2031
Discharge Location	North bank of the Kickapoo River, 60 ft south from fence behind the plant, approximately 250 feet upstream railroad bridge over the Kickapoo River SW1/4, NW1/4, Section 17, T7N R4W, Town of Wauzeka, Crawford County, WI
Receiving Water	Kickapoo River in the Lower Kickapoo River Watershed of Lower Wisconsin River Basin in Crawford County
Stream Flow (Q _{7,10})	190 cfs
Stream Classification	Warm Water Sportfish, Nonpublic Water Supply
Discharge Type	Existing, continuous
Annual Average Design Flow (MGD)	0.08 MGD
Industrial or Commercial Contributors	None
Plant Classification	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 Wauzeka Wastewater Treatment Facility treats domestic wastewater from the Village of Wauzeka. The annual average design flow is 0.08 million gallons per day (MGD) and the actual annual average in 2025 was 0.0257 MGD. The treatment facility is a contact stabilization package plant. Wastewater is treated via a fine screen, secondary clarifier, contact stabilization, activated sludge and then disinfected seasonally with ultraviolet light prior to discharge to the Kickapoo River. The facility utilizes aluminum sulfate for phosphorus removal. Sludge is aerobically digested, then hauled and land applied by a contracted hauler. No major operational changes occurred during the last permit term.

Substantial Compliance Determination

Enforcement During Last Permit: Wauzeka received significant compliance assistance with their water quality trading (WQT) projects after unusual annual reports prompted a site visit. The site visit determined that there were significant erosion and other issues with the WQT projects that needed quick repair. Wauzeka worked with the department to rectify the issues and has since improved on their annual reporting. A Notice of Noncompliance (NON) was issued in 2021 for failure to sample sludge in 2020. There have only been 3 effluent limit violations across the entire permit term – 2 for BOD in 2021 and 1 for phosphorus in 2022. The facility has also submitted a few forms late. Overall, the facility has shown a willingness to work with the department and correct issues as they become a problem. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on May 19, 2026, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Katie Jo Jerzak, PE on 08/17/2026.

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	Flow is not measured at the influent sample point	Representative influent samples shall be collected at the influent wet well prior to any return flows.
001	0.0257 MGD (2025)	Representative composite and grab effluent samples shall be collected at the V-notch weir after disinfection prior to discharge to the Kickapoo River. Flow shall be monitored at the V-notch weir.
002	3 metric tons land applied in 2025	Representative composite sludge samples shall be collected at the outlet pipe on the sludge storage tanks and monitored for Lists 1, 2, 3 & 4 and PFAS annually and once in 2027 for PCBs.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT AT WET WELL

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

Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section. Language was added into the sample point location clarifying that samples shall be collected prior to any return flows.

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 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT TO THE KICKAPOO RIVER

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Min	6.0 su	5/Week	Grab	See pH section in permit
pH Field	Daily Max	9.0 su	5/Week	Grab	See pH section in permit
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Look up the variable ammonia limit from the 'Variable Ammonia Limitation' table in the permit and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section in

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					permit.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	108 mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	108 mg/L	2/Week	24-Hr Flow Prop Comp	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit & monitoring apply May - Sept
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May - Sept. See the E. coli Percent Limit section in permit. Enter the result in the DMR on the last day of the month.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Phosphorus, Total	Monthly Avg	7.0 mg/L	2/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level.
Phosphorus, Total		lbs/day	2/Week	Calculated	Report daily mass discharged using Equation 1a. in the WQT section in permit.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) section in permit. Available TP Credits are specified in Table 2 and in the approved Water Quality Trading Plan.
WQT Credits Used (TP)	Annual Total	236 lbs/yr	Monthly	Calculated	The sum of total monthly credits used may not exceed

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Table 2 values listed in permit.
WQT Computed Compliance (TP)	6-Month Avg	0.1 mg/L	Monthly	Calculated	Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Computed Compliance (TP)	Monthly Avg	0.3 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) section in permit. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.067 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3b. in the Water Quality Trading (WQT) section in permit. Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Nitrogen Series Monitoring section in permit for specific quarters that monitoring is required.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Nitrogen Series Monitoring section in permit for specific quarters that monitoring is required.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	See Nitrogen Series Monitoring section in permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit: 1) the sample frequency for flow has changed from “continuous” to “daily” for eDMR reporting purposes, 2) Total Nitrogen Monitoring (TKN, N02+N03 and Total N) has been reduced from quarterly to annually in specific quarters as outlined in the permit, 3) the sample frequency for ammonia increased from weekly to 2/week, and 4) Monitoring for PFOS and PFOA every two months is included in the permit in accordance with s. NR 106.98(2)(d), Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

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. At this time, there is an increase in monitoring frequency for ammonia from weekly to 2/week. All other monitoring frequencies for the other parameters remain the same as the previous permit term, due to the facility’s consistent and good effluent quality.

Limits were determined for Wauzeka’s existing discharge to the Kickapoo River using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the July 31, 2026 memo from Nicole Krueger to Holly Heldstab titled “Water Quality-Based Effluent Limitations for the Wauzeka Wastewater Treatment Facility WPDES Permit No. WI-0022276-11”.

MUNICIPAL EFFLUENT LIMITS – In accordance with the federal regulation 40 CFR 122.45(d), and to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

Ammonia: Weekly and monthly average ammonia limits apply. Daily maximum ammonia limits that vary with effluent pH apply year-round are presented in the table below.

Variable Daily Max Ammonia Limitation

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

Phosphorus – Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for the Kickapoo River is 100 ug/L. In this case, the WQBEL is 0.3 mg/L (monthly average), 0.1 mg/L & 0.067 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 0.3 mg/L). This final effluent limit was derived from and complies with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. The minimum concentration limit (MCL) of 7.0 mg/L (monthly average) 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-2026-0024) or approved amendments thereof. The total ‘WQT TP Credits’ available are designated in the approved WQT Plan. The Village is implementing a variety of management practices including two wet detention ponds and streambank stabilization. The WQT Plan proposes the generation of 236 lbs/yr of phosphorus credits for the next five years.

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

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that PFOS+PFOA biosolids monitoring data is greater than 25 µg/kg.

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

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

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal coliform & aerobic digestion	Aerobic SOUR test & injection	Land application	3 metric tons (2025)
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						
Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 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	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
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	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Grab	Once in 2027
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Grab	Once in 2027
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more 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: 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).

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.

4 Schedules

4.1 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	10/31/2027
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	10/31/2028

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

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

4.2 Water Quality Trading (WQT) Annual Report

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

Explanation of Schedule: Annual Water Quality Trading (WQT) Reports - 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 credit verification package 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

Other Comments

None

Attachments

- Water Quality Trading Plan, WQT-2026-0004
- Water Quality Trading Conditional Credit Certification letter dated March 13, 2026 from Jenna Monahan to Ravis Lomas, Village of Wauzeka Village President
- Water Quality Based Effluent Limits: July 31, 2026 memo from Nicole Krueger to Holly Heldstab titled “Water Quality-Based Effluent Limitations for the Wauzeka Wastewater Treatment Facility WPDES Permit No. WI-0022276-11”.

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Holly Heldstab, Wastewater Specialist

Date: 09/10/2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 07/31/2026

TO: Holly Heldstab – WCR

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Wauzeka Wastewater Treatment Facility
WPDES Permit No. WI-0022276-11

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 the Wauzeka Wastewater Treatment Facility in Crawford County. This municipal wastewater treatment facility (WWTF) discharges to the Kickapoo River, located in the Lower Kickapoo River Watershed in the Lower Wisconsin River Basin.

The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD ₅			45 mg/L	30 mg/L		1,3
TSS			45 mg/L	30 mg/L		1,3
pH	9.0 s.u.	6.0 s.u.				1,3
Ammonia Nitrogen	Variable		108 mg/L	108 mg/L		4,5
Bacteria						6
<i>E. coli</i>				126 #/100 mL geometric mean		
PFOS and PFOA						7
Phosphorus MCL WQBEL				7.0 mg/L 0.300 mg/L	0.100 mg/L 0.067 lbs/day	1,8
TKN, Nitrite+Nitrate, and Total Nitrogen						1,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
8. Wauzeka is complying with the phosphorus WQBELs through water quality trading. The minimum control level (MCL) is the end of pipe limit.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. 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 nitrite (NO₂), nitrate (NO₃), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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

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 (2) – Narrative & Outfall Map

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

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

WPDES Permit No. WI-0022276-11

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Wauzeka Wastewater Treatment Facility treats domestic wastewater from the Village of Wauzeka. The annual average design flow is 0.08 million gallons per day (MGD). The treatment facility is a contact stabilization package plant. Wastewater is treated via a fine screen, secondary clarifier, contact stabilization, activated sludge and then disinfected seasonally with ultraviolet light prior to discharge to the Kickapoo River. Aluminum sulfate is added for the removal of phosphorus. Sludge is aerobically digested, then hauled and landspread.

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

Existing Permit Limitations

The current permit, which expired on March 31, 2026, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			45 mg/L	30 mg/L		2,3
TSS			45 mg/L	30 mg/L		2,3
pH	9.0 s.u.	6.0 s.u.				2
Ammonia Nitrogen	Variable					4
<i>E. coli</i> May – September				126#/100 mL geometric mean		5
Phosphorus MCL WQBEL				7.0 mg/L 0.300 mg/L	0.100 mg/L 0.067 lbs/day	6
TKN, Nitrite+Nitrate, and Total Nitrogen						1

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 Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
4. The variable daily maximum ammonia limits are shown below:

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

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. Wauzeka is complying with the phosphorous WQBELs through water quality trading (WQT) and the minimum control level (MCL) applies as the end of pipe limit.

Receiving Water Information

- Name: Kickapoo River
- Waterbody Identification Code (WBIC): 1182400
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use.
- 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 05410500, where Outfall 001 is located.
 - 7-Q₁₀ = 190 cubic feet per second (cfs)
 - 7-Q₂ = 248 cfs
 - Harmonic Mean Flow = 364 cfs using a drainage area of 690 mi²

The 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 = 266 mg/L as CaCO₃. This value represents the geometric mean of data from the Kickapoo River at Bridge St in Steuben (Station ID 123017).
- % 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 Kickapoo River at Bridge St in Steuben (Station ID 123017) is used for this evaluation. 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: There are several other dischargers to the Kickapoo River; however, they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Kickapoo River upstream of the outfall is 303(d) listed as impaired for mercury and phosphorus (miles 19.05 - 25.45) and phosphorus (miles 61.03 – 119.40). The Wisconsin River, approximately ¾ miles downstream of Outfall 001, is 303(d) listed as impaired for mercury and PCBs.

Effluent Information

- Design flow rate(s):
Annual average = 0.08 million gallons per day (MGD)
For reference, the actual average flow from 05/01/2021 – 05/31/2026 was 0.037 MGD.
- Hardness = 295 mg/L as CaCO₃. This value represents the geometric mean of four samples collected in May 2025 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with 0 industrial contributors.
- Water supply: Municipal wells.
- Additives:
 - Hawkins Inc. – Aluminum Sulfate: Phosphorus removal
 - 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.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- 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.

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
05/02/2025	5.9	05/15/2025	4.5	05/30/2025	<3.2
05/06/2025	6.0	05/20/2025	4.3	06/02/2025	11
05/09/2025	7.6	05/23/2025	4.2	06/05/2025	<3.2
05/12/2025	5.6	05/27/2025	3.4		
Average = 4.8 µg/L					

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

Chloride Effluent Data

Sample Date	Chloride mg/L
05/02/2025	136
05/06/2025	113
05/09/2025	160
05/12/2025	126
Average	134

The following table presents the average concentrations and loadings at Outfall 001 from 05/01/2021 – 05/31/2026 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 Discharged
BOD ₅	9.16 mg/L*	
TSS	4.46 mg/L	
pH field	7.34 s.u.	
Ammonia Nitrogen	3.95 mg/L	
<i>E. coli</i>	13.1 #/100 mL**	
Phosphorus	0.53 mg/L	0.17 lbs/day

*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. Adm. 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.

Q_s = 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).

Q_e = 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

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

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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 not the case for Wauzeka, and the limits are set based on two times the acute toxicity criteria.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 152 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 MAX. CONC.
Arsenic		340	0.48	680	136	<1.1	
Cadmium	295	35.7	0.011	71.3	14.3	<0.17	
Chromium	295	4373	0.98	8746	1749	<1.5	
Copper	295	43.1	0.50	86.1	17.2	4.77	
Lead	295	304	0.79	608	122	<5.4	
Nickel	268	1080	1.17	2161	432	<4.7	
Zinc	295	310	3.05	620	124	22	
Chloride (mg/L)		757	7.49	1514	303	134	160

* 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.

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 47.5 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.
Arsenic		152	0.48	58374	11675	<1.1
Cadmium	175	3.82	0.011	1465	293	<0.17
Chromium	266	294	0.98	112884	22577	<1.5
Copper	266	23.9	0.50	9009	1802	4.77
Lead	266	72.1	0.79	27425	5485	<5.4
Nickel	266	119	1.17	45497	9099	<4.7
Zinc	266	283	3.05	107788	21558	22
Chloride (mg/L)		395	7.49	149098	29820	134

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 90.9 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.011	272017	54403	<0.17
Chromium (+3)	3818000	0.98	2807001977	561400395	<1.5
Lead	140	0.79	102349	20469.8	<5.4
Nickel	43000	1.17	31612843	6322569	<4.7

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 90.9 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	0.48	9427	1885	<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 not required for one of the toxic substances in this section.

Mercury – The permit application did not require monitoring for mercury because Wauzeka is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code.” A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level, with all concentrations being nondetect. Therefore, no mercury monitoring is recommended at Outfall 001.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from Wauzeka Waterworks (PWS ID: 61202537) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
06/06/2023	682512001	BF428	<0.291	<0.401

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Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
06/06/2023	682513001	BF429	<0.294	<0.405
Average =			ND	ND

The available biosolids data is shown in the table below:

Biosolids PFAS Data

Sample Date	PFOS (µg/kg)	PFOA (µg/kg)
10/21/2025	25.1	4.55
Total	29.65	

Because the PFOS+PFOA biosolids monitoring data is greater than 25 µg/kg, **effluent PFOS and PFOA monitoring is recommended at a once every two months frequency.**

**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 limits. These limits are re-evaluated at this time due to the following changes:

- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.

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

The effluent pH data was examined as part of this evaluation. A total of 1325 sample results were reported from 05/04/2021 – 05/29/2026. The maximum reported value was 8.73 s.u. (Standard pH Units). The effluent pH was 7.71 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 7.68 s.u. The mean plus the standard deviation multiplied by a factor of 2.326, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.67 s.u. Therefore, a value of 7.7 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.7 s.u. into the equation above yields an ATC = 14 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

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ammonia limit calculation ($2 \times \text{ATC}$) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
$2 \times \text{ATC}$	29
$1-Q_{10}$	17674

The $2 \times \text{ATC}$ method yields the most stringent limits for Wauzeka.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWSF

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

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

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,

E = 0.854,

C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or

C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and

T = the temperature ($^{\circ}\text{C}$) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (°C) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

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

The “default” basin assumed values are used for Temperature, pH and background ammonia concentrations, because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Q _e (MGD)	0.08	0.08	0.08
Background Information	7-Q ₁₀ (cfs)	190	190	190
	7-Q ₂ (cfs)	248	248	248
	Ammonia (mg/L)	0.06	0.06	0.085
	Average Temperature (°C)	12	19	4
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	8.10	8.13	8.07
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	95	190	47.5
	Reference Monthly Flow (cfs)	105	211	52.7
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	5.22	3.39	
	Early Life Stages Absent			7.35
	30-day Chronic			
	Early Life Stages Present	2.09	1.36	
Effluent Limitations mg/L	Early Life Stages Absent			2.94
	Weekly Average			
	Early Life Stages Present	3968	5118	
	Early Life Stages Absent			2796
	Monthly Average			
	Early Life Stages Present	1730	2210	
	Early Life Stages Absent			1219

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 05/04/2021 – 05/27/2026.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P ₉₉	14.2
4-day P ₉₉	8.28
30-day P ₉₉	5.28
Mean	3.95
Std	2.79
Sample size	530
Range	0.06 - 18.48

Reasonable Potential

The need to include ammonia limits in Wauzeka's permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia year-round 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.

Expression of Limits

Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum ammonia limit is necessary for Wauzeka, **weekly and monthly average limits are also required under this code revision.**

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

In this case, the recommended daily maximum limits vary with effluent pH, so additional limits should be set equal to the highest recommended limit. Therefore, **monthly and weekly average limits of 108 mg/L** are recommended in the permit.

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. Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are denoted in bold text.

Final Ammonia Nitrogen Limits

Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
Variable	108	108

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 Wauzeka has phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.

Water Quality-Based Effluent Limits (WQBEL)

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

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

Qs = 100% of the 7-Q₂ of 248 cfs

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

Qe = effluent flow rate = 0.08 MGD = 0.124 cfs

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

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Adm. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

Attachment #1

A previous evaluation resulted in a WQBEL of 0.100 mg/L using a background concentration of 0.137 mg/L in the Kickapoo River at Bridge St in Steubun (SWIMS station ID 123017) from 05/16/2007 – 10/12/2017. 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.

A review of all available in stream total phosphorus data from 05/26/2016 – 05/21/2026 (n=70) stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in the Kickapoo River at Bridge St in Steubun (SWIMS station ID 123017) is 0.11 mg/L, upstream from the point of discharge.

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 0.100 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 is 0.100 mg/L.**

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 05/04/2021 – 05/27/2026.

Total Phosphorus Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P ₉₉	2.32	1.97
4-day P ₉₉	1.29	1.33
30-day P ₉₉	0.76	0.56
Mean	0.53	0.17
Std	0.47	0.60
Sample size	530	529
Range	0.07 - 7.74	0.01 - 13.25

Reasonable Potential Determination

The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion and is currently operating the treatment facility to remove phosphorus and meet the WQBELs. Therefore, **the WQBELs are required to continue in the reissued permit per ss. NR 217.15 and 205.067(5), Wis. Adm. Codes.**

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 0.100 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 0.300 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

Mass Limits

A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of a phosphorus impaired water. **This final mass limit shall be $0.100 \text{ mg/L} \times 8.34 \times 0.080 \text{ MGD} = 0.067 \text{ lbs/day}$ expressed as a six-month average.**

Water Quality Trading Minimum Control Level

A WQT plan has been submitted as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the phosphorus WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but an MCL must be set as a limit not to be exceeded at the outfall location. **Therefore, the phosphorus MCL of 7.0 mg/L as a monthly average is recommended during the reissued permit term to serve as the MCL, which is equal to the currently effective MCL.**

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

Due to the amount of upstream flow available for dilution in the limit calculation ($Q_s:Q_e > 20:1$), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

At temperatures above ~103°F, conventional biological treatment systems stop functioning properly and experience upsets. There is no indication that this has ever occurred at this treatment system. This information, coupled with the lack of significant industrial heat load, lead to the conclusion that there is no reasonable potential for the discharge to exceed the 120°F limitation. **No limits or monitoring are recommended to be included in the reissued permit for temperature.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

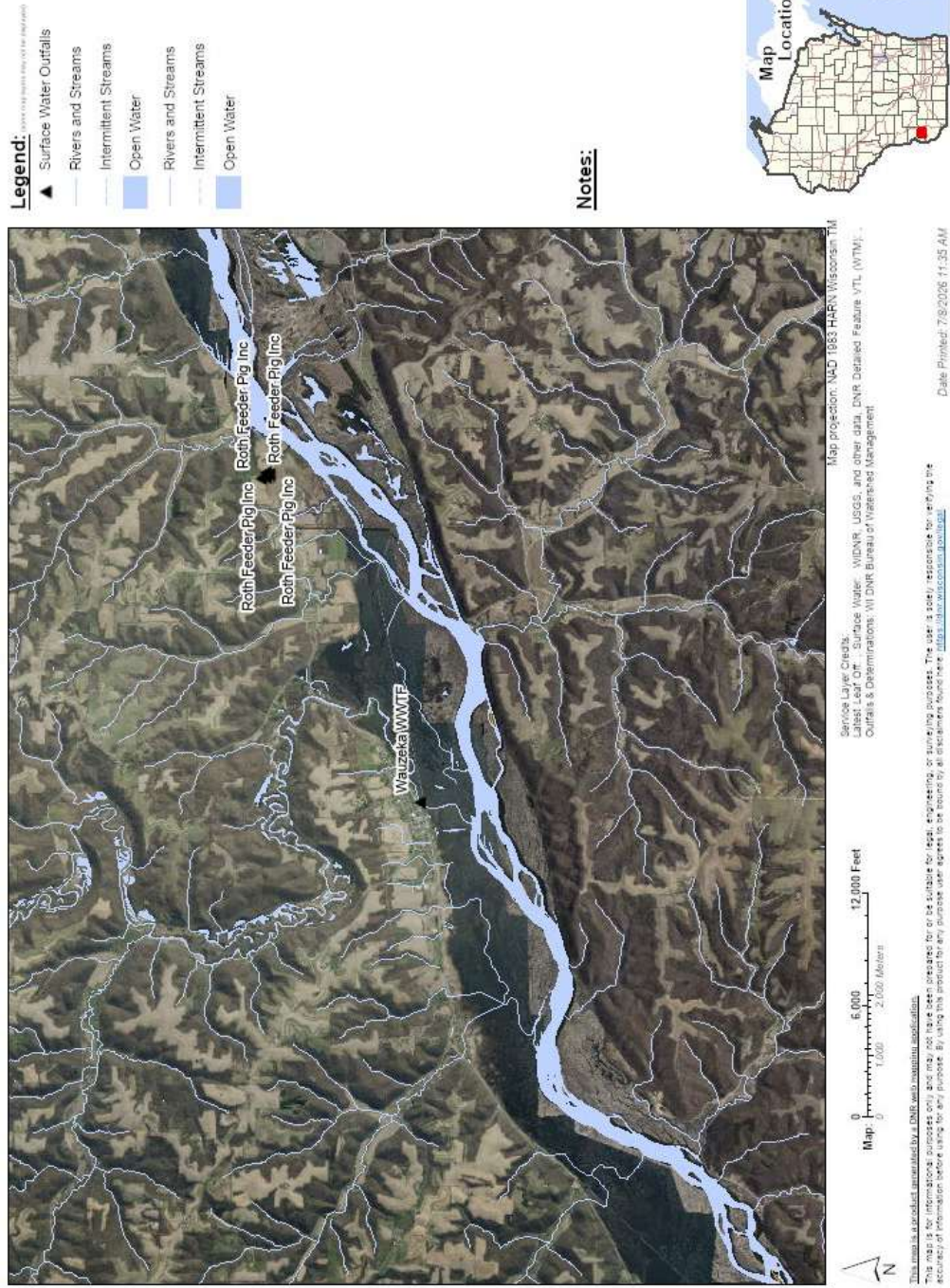
WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data 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).

- Chronic testing is usually not recommended where the ratio of the 7-Q₁₀ to the effluent flow exceeds 100:1 and acute testing is not typically recommended if the ratio exceeds 1000:1. For Wauzeka, that ratio is approximately 1535:1. With this amount of dilution, there is believed to be little potential for acute or chronic toxicity effects in the Kickapoo River associated with the discharge from Wauzeka, **so the need for acute and chronic WET testing will not be considered further.**

Attachment #1



Wauzeka WWTF Outfall Location





March 13, 2026

Ravis Lomas, Village President
Village of Wauzeka
PO Box 344
Wauzeka, WI 53826

Subject: Village of Wauzeka WPDES Permit #WI-0022276
Water Quality Trading Plan – CONDITIONAL CREDIT CERTIFICATION

Dear Mr. Lomas:

Thank you for submitting the final draft of the Water Quality Trading (WQT) Plan. The final plan draft was received on February 26, 2026. Based on the WDNR review, the WQT Plan is in general conformance with the WDNR Water Quality Trading Guidance and Wis. Stat 283.84. The WQT Plan indicates that the Village of Wauzeka will utilize Water Quality Trading to comply with the effluent limitations for TP for their discharge to the Kickapoo River. The WQT Plan proposes to utilize two wet detention ponds and streambank stabilization for the generation of available phosphorus credit quantities shown in Table 1. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limit. These credits are generated and expire on a calendar year basis.

Table 1: Total Phosphorus Credits Available per WQT-2026-0004

Year	Available TP Credits Total (lbs/yr)
2026	236
2027	236
2028	236
2029	236
2030	236
2031	236

*In the event that the permit is not reissued prior to the expiration date, annual available TP credits listed below will be available in the subsequent year(s).

The WDNR certifies the credits in this WQT Plan as a basis for water quality trading during the WPDES permit term. Please note that the credits generated by ponds 1 and 2 are based on the current agricultural management of the tributary areas. Changes in management, including cropping and tillage practices, that differ from those documented within the SnapPlus model, will require an evaluation to ensure that the changes do not impact the number of credits generated.

The maintenance plan for the ponds should be consistent with the requirements outlined in the Wisconsin Department of Natural Resources Technical Standard 1001 but may require more frequent inspections and removal of accumulated sediment given that these ponds treat agricultural areas, which may receive more significant sediment and phosphorus loadings than ponds treating similarly sized urban watersheds. The WDNR

concur that at a minimum the ponds should be inspected monthly and following heavy rain events. The use of wet detention basins to treat agricultural runoff has shown mixed results with ponds often becoming sources of phosphorus if the phosphorus laden sediment is not regularly removed. Excessive growth of algae in the ponds and sediment accumulation above the sediment storage depth could be indications that phosphorus leaching could be occurring and that the pond requires corrective action. Failure to maintain the ponds will negatively impact their treatment ability and will reduce the amount of credits being generated.

The WDNR has assigned the WQT Plan a tracking number of WQT-2026-0004 which will be referenced as such in the draft WPDES permit. The final WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring. Any modifications to the WQT Plan within the permit term will also require a modification to the permit and a public notification period.

If you have any questions or comments, please contact me at 715-492-4323 or at jenna.monahan@wisconsin.gov

Sincerely,

A handwritten signature in black ink that reads "Jenna Monahan". The script is cursive and fluid, with the first name "Jenna" and last name "Monahan" clearly legible.

Jenna Monahan, P.E.
Wastewater Engineer - West Central Region
Wisconsin Department of Natural Resources

CC (email): Jordan Fure, Delta 3
Bart Nies, Delta 3
Matt Claucherty, WDNR
Geisa Thielen, WDNR
Holly Heldstab, WDNR
Katie Jo Jerzak, WDNR

WATER QUALITY TRADING PLAN

November 25, 2020

Updated: February 26, 2026



Village of Wauzeka Wastewater Treatment Facility

WPDES Permit No. WI-0022276-11-0

410 East Front Street

Wauzeka, Wisconsin

Prepared by:

Delta 3 Engineering, Inc.

875 S Chestnut St. | Platteville, WI 53818

Phone: (608) 348-5355

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Project Number: D15-096

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Attachments

- 1) Notice of Intent to Conduct Water Quality Trading Submitted by Village of Wauzeka Wastewater Treatment Facility to WDNR (2/13/19)
- 2) Water Quality Trading Checklist
- 3) Village of Wauzeka Location Map
- 4) Sanitary Sewer Map
- 5) WWTF Schematic
- 6) HUC-12 Watershed Map
- 7) Conceptual Plan
- 8) Soils Map
- 9) Wet Detention Pond Catchments Map
- 10) Modeling Data
- 11) Soil Testing Data
- 12) Streambank Erosion Documentation
- 13) Operation and Maintenance (O&M) Plan
- 14) Annual Water Quality Trading (WQT) Reports 2022-2025

I. Executive Summary -

This Water Quality Trading Plan summarizes the Village of Wauzeka's (Village) plan to utilize Water Quality Trading (WQT) for compliance with the final total phosphorus limit as provided in the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0. The Wastewater Treatment Facility (WWTF) treated an average of 0.035 MGD in 2024. The WWTF had an average effluent Total Phosphorus (TP) concentration of 0.54 mg/L during this permit term. The WWTF is required to utilize WQT Credits to satisfy the final annual six-month average limit of 0.1 mg/L and a monthly average limit of 0.3 mg/L which became effective May 1, 2021.

NRCS Streambank Erosion Estimator, Snap-Plus, HydroCAD, and P8 modeling methods were used to calculate the TP credits that would be generated based on the installation of best management practices (BMPs). These credits will be used to demonstrate compliance with the final total phosphorus limit as proposed in the WPDES Permit. Modeling results are provided in Table 1.1.

Table 1.1 – Modeling Results

Proposed BMP	Proposed Phosphorus Reductions (lbs/yr)	Trade Ratio	Proposed Phosphorus Credits
Wet Detention Pond #1	172	2.1:1	81.9
Wet Detention Pond #2	222	2.1:1	105.7
Streambank Stabilization	97	2:1	48.5
Total			236.1

NOTE: Justification for Trade Ratio is provided below.

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

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

Downstream:

1. 0 (Trades upstream of the Outfall 001)
2. 0.1 (Trades downstream of the Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty:

3. *Sediment Control Basin = 2 (For agricultural runoff)*
4. *Streambank Stabilization = 2 (with In-Stream Habitat Improvements)*

As demonstrated in Table 1.1, the WWTF had registered 236.1 credits. The implementation of this WQT Plan will provide WQT Credits to the WWTF for meeting final TP limits.

II. Background -

The purpose of this Water Quality Trading Plan (Plan) is to describe the Village's use of Water Quality Trading to comply with the total phosphorus limits as provided in Village's WPDES Permit #WI-0022276-10-0. The Plan was developed following the Notice of Intent to Conduct Water Quality Trading, provided in Attachment #1, which was submitted on February 13, 2019. The Water Quality Trading Checklist Form 3400-208 is provided in Attachment #2.

The Village of Wauzeka is located in Crawford County along State Trunk Highway '60' in southwest Wisconsin. The Village operates and maintains its own public wastewater and water systems. The Village is located in Sections 17 and 18, Town 7 North, Range 4 West of the Fourth Principal Meridian. The Village has a population of 711 and contains one (1) service area, which is the Village Proper.

The downtown portion of the Village is comprised mostly of commercial and residential development and is situated along the Wisconsin River and Kickapoo River. The Village currently does not have any industrial development. The Village has a generally gentle slope ranging from 1% to 5%. Elevations in the area range from approximately 640± at the Wastewater Treatment Facility (WWTF) to 748± at the water tower, which is located on the north side of the Village. The topography of the area is shown in Attachment #3.

The existing sanitary sewer collection consists of 85 sanitary sewer manholes; one (1) sanitary lift station; 22,900 feet of sanitary sewer; and 605 feet of sanitary force main. The Village currently uses its CMOM Program for documenting operation and maintenance activities within the collection system. A map of the Village Sanitary Sewer System is provided in Attachment #4.

The Village of Wauzeka owns and operates a Wastewater Treatment Facility (WWTF) that utilizes a contact stabilization activated sludge treatment facility. The facility consists of a vertical mechanical screen, grit removal, aeration tanks, and final clarifier. The effluent discharges to the Kickapoo River. Sludge from the treatment process is aerobically digested and stored prior to land spreading on DNR approved sites. Alum is used at the treatment facility for the removal of Phosphorus. The current WWTF can treat a design flow of 0.08 MGD. Please see Attachment #5 for the flow schematic of the Village of Wauzeka's WWTF. The WWTF has one (1) receiving water and effluent discharge location, Outfall 001: Kickapoo River (Lower Kickapoo River Watershed, Lower Wisconsin River Basin).

To reduce effluent TP, the Village has made efforts to optimize TP reduction at the WWTF. The Village has also implemented source reduction measures such as investigating potential TP contributors and requiring pretreatment. None of the businesses were determined to be substantial contributors for TP. Furthermore, the Village has implemented chemical addition and evaluated Alum dosage rates to identify the optimal dosage. The Village had determined that Alum alone will not satisfy final Effluent TP Limits.

Additionally, the Village has investigated watershed compliance alternatives such as Water Quality Trading (WQT) and Adaptive Management (AM). Utilizing the results from PRESTO, the watershed for the Wauzeka WWTF has a nonpoint source ratio of 1:99 and is considered to be nonpoint-source dominated. The Village has performed stream monitoring on the Kickapoo River upstream and downstream of the WWTF outfall. The results are provided in Table 2.1 below. The stream monitoring locations are provided in Figure 2.1. Instream monitoring demonstrated that the Kickapoo River was not meeting the water quality standard of 0.1 mg/L for TP. Additionally, testing performed below Outfall 001 demonstrated that the Village of Wauzeka Effluent had no measurable effect on in-stream TP concentrations.

Following the initial investigation, the Village elected to move forward with WQT. The Village intends to perform WQT projects within the Village's HUC-12 #070700060507 as provided in Attachment #6.

Table 2.1 – 2018/2019 Stream Monitoring Data

	Total Phosphorus Concentration (mg/L)	
Date	Kickapoo River upstream (1)	Kickapoo River downstream (2)
Jan. 4, 2019	0.19	0.11
Jan. 10, 2019	0.28	0.28
Jan. 16, 2019	0.14	0.14



Figure 2.1 – Stream Monitoring Locations

The annual average effluent flows and loadings at the WWTF from 2018 through 2025 are provided in in Table 2.2.

Table 2.2 – 2018-2024 Annual Averages

Year	Outfall	Flow	Phosphorus	Phosphorus	Phosphorus
		MGD	mg/L	lbs./day	WQT Credits Used
		Effluent	Effluent	Effluent	
2018	001	0.046	3.76	1.44	-
2019	001	0.079	1.20	0.65	-
2020	001	0.049	0.40	0.16	-
2021	001	0.043	0.55	0.21	21.55
2022	001	0.046	0.46	0.15	39.67
2023	001	0.035	0.61	0.30	99.70
2024	001	0.035	0.53	0.14	39.75
2025	001	0.026	0.60	0.11	32.45

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

Seasonal Average (2021-2025) Daily Flow (Q) = 0.037 MGD
Average Phosphorus concentration (2021-2025) = 0.55 mg/L

$$0.037 \text{ MGD} \times 0.55 \text{ mg/L} \times 8.34 \times 365 \text{ days/yr.} = \mathbf{62 \text{ lbs./yr.}}$$

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

Seasonal Average Daily Flow (Q) = 0.037 MGD
Proposed Seasonal Phosphorus Concentration Limit = 0.100 mg/L

$$0.037 \text{ MGD} \times 0.100 \text{ mg/L} \times 8.34 \times 365 \text{ days/yr.} = \mathbf{11 \text{ lbs./yr.}}$$

- 3) Reduction of Total Phosphorus required at WWTF:

$$62 \text{ lbs./yr.} - 11 \text{ lbs./yr.} = \mathbf{51 \text{ lbs./yr.}}$$

The current required reduction of Total Phosphorus is approximately 51 lbs/yr which is 22% of the available 236.1 WQT Credits. The Village currently has adequate WQT Credits to offset discharges.

III. Location and Description of Credit Generation Sites –

The Village discharges to the Kickapoo River (Lower Kickapoo River Watershed, Lower Wisconsin River Basin) at Outfall 001. As mentioned previously, the Village has performed WQT projects within the Village's HUC-12 #070700060507. The Village has implemented BMPs to generate TP credits. Specifically, the Village has installed two (2) wet detention ponds and constructed a Streambank Stabilization along the banks of the Kickapoo River. Locations of the BMPs are provided in Figure 3.1 below. These Projects were constructed on properties owned by the Village.



Figure 3.1 – BMP locations in relation to Outfall 001.

IV. Methods for Nonpoint Source Reduction -

The Plan identifies trading practices that have reduced TP runoff by more than 491 lbs and will utilize a 2:1 trade ratio for upstream trades and a 2.1:1 trade ratio for downstream trades. Downstream trade ratios were determined by Table 4.1 as provided by the Wisconsin DNR.

Table 4.1 – Downstream Trading Factor

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

$$\text{Percent Difference} = \frac{(1 - (Q_e \times C_e) / (Q_e \times C_e + Q_s \times C_s)) \times 100}{3\%} = 3\%$$
$$\text{Downstream Trading Factor} = 0.1$$

Q_s = Receiving water flow (7Q2) = 248 cfs

Q_e = Effluent flow = 0.079 MGD = 0.12 cfs

C_s = Background concentration of TP = 0.137 mg/L

C_e = Effluent concentration of TP = 1.20 mg/L

A. Methods Used to Generate Load Reductions

The Village has also generated TP load reductions by installing two (2) wet detention ponds in conjunction with streambank stabilization.

The two (2) wet detention ponds are new BMP structures. Wet pond construction was performed as per NR 350 *Sediment Basin* standards. The wet detention ponds reduce Phosphorus loading to the stormwater system by settling TP laden sediment. Sediment storage is provided within the wet detention pond. Sediment is periodically removed as needed.

Flows continue to discharge to the same drainage-way as previous while peak flows and TSS concentrations have been reduced. An emergency spillway was provided in the event the outlet pipe(s) plug or cannot handle excess flows. This stormwater treatment project was constructed within HUC-12 #070700060507 in order to generate TP credits. A concept plan for the wet detention pond construction is provided in Attachment #7.

For streambank stabilization, the Village is generating TP load reductions through streambank grading and riprapping of approximately 1,375 feet. Streambank Stabilization was performed as per NR 328 *Shore Erosion Control Structures in*

Navigable Waterways, NRCS 580 *Streambank and Shoreline Protection*, and NRCS 395 *Stream Habitat Improvement and Management*. Streambank shaping and riprapping has eliminated the discharge of sediment to the stream. In-stream habitat improvements were installed with the streambank stabilization improvements. A concept plan for streambank stabilization is provided in Attachment 7.

The Village is contracted with Bart Nies, PE/President for Delta 3 Engineering, Inc. to design the BMPs and prepare the plans, specification, and operation and maintenance manual. The Village acquired all required permits and authorizations prior to construction. To register credits, the Village has entered into a trade agreement with the DNR pursuant to *s. 283.84(1)(c), Wis. Stats.*

B. History of Project Site

The properties on which streambank stabilization and wet detention ponds #1 and #2 are located is owned by the Village of Wauzeka.

Wet detention ponds #1 and #2

Wet detention ponds #1 and #2 is located within an existing stormwater drainage way. An intermittent stream is shown on the surface water data viewer. Both wet detention ponds have been evaluated for presence of wetlands. The DNR has reviewed the proposed sites and did not have any restrictive conflicts during permitting. The watershed draining to the Pond #1 is composed of 34.66 acres of forest and 15.70 acres of row crops. The area draining to Pond #2 is composed of 20.53 acres of forest and 15.10 acres of row crops. The soils in the catchment areas are composed primarily of silt loam with slopes ranging from 5% to 20%. A soils map is provided in Attachment #8. A map of the catchment areas is provided in Attachment #9.

Streambank Stabilization

The land adjacent to the proposed streambank stabilization is maintained lawn which is utilized as a Village Municipal Park. The land is primarily open with minimal trees. The streambank had experienced significant erosion as the Kickappoo River had been developed and cleared for agricultural and residential use. The banks were typically bare with some rills and vegetative overhang. Tree roots, fallen trees, and slumps were visible within the proposed banks. The erosion indicators demonstrate the lateral recession rate is Moderate to Severe.

C. Models Used to Derive Load Reductions

Total Phosphorus Runoff delivered to the proposed wet detention ponds was determined with the aid of the Snap-Plus Model and RUSLE2 Data. The modeling data is provided in Attachment #10.

NRCS Streambank Erosion modeling methods were used to calculate the total phosphorus credits that would be generated based on the installation of BMPs. Model results are provided in Attachment #10. These credits are used to demonstrate compliance

with the final total phosphorus limit as proposed in the WPDES Permit. Modeling results are provided in Table 4.1.

Soil testing has been completed to determine TP concentrations within the soil. Soil sampling was performed along the stream reaches and within each field and included the use of a soil sampler which pulled ¾” cores at 8” depth. Approximately six (6) cores were taken at each sampling location to provide a representative sample. Soils testing data is provided in Attachment #11. An onsite evaluation has been conducted to estimate stream bank recession rate. The data, narrative, and photos documenting the current state of eroding stream banks are provided in Attachment #12.

With the collected data, the NRCS Streambank Erosion Estimator was used to calculate TP loss from each reach of the eroding streambank. The streambank grading and riprap design will continue to eliminate streambank recession thus eliminating TP inputs due to streambank recession in riprap areas. The Village has implement in-stream habitat improvements as identified as a priority in the 2011 Water Quality Management Plan Update for the Lower Kickapoo River Watershed and coordinated with Kirk Olson – DNR Fisheries Biologist. The Village submitted the final design plans and specifications to the DNR and received approval. TP Credits were registered following construction of the BMPs.

The Plan and Model inputs have not changed; therefore models and calculations are accurate as previously approved. TP Credits generated have been used to demonstrate compliance with the final total phosphorus limit as proposed in the WPDES Permit.

Table 4.1 – TP Credit Production

BMP	Phosphorus Reductions (lbs/yr)	Trade Ratio	WQT Phosphorus Credits
Wet Detention Pond #1	172	2.1:1	81.9
Wet Detention Pond #2	222	2.1:1	105.7
Streambank Stabilization	97	2:1	48.5
Total			236.1

NOTE: Justification for Trade Ratio is provided below.

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

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

Downstream:

1. 0 (Trades upstream of the Outfall 001)
2. 0.1 (Trades downstream of the Outfall 001)

Equivalency = 0 (Not necessary of Total Phosphorus)

Uncertainty:

3. *Sediment Control Basin* = 2 (For agricultural runoff)
4. *Streambank Stabilization* = 2 (with In-Stream Habitat Improvements)

D. Operation and Maintenance

An Operation and Maintenance (O&M) Plan is provided in Attachment #13. The O&M plan describes how the Best Management Practices (BMPs) are operated and

maintained. The O&M Plan also addresses response procedures for Practice Registration, Noncompliance Notification, and Notification of Trade Agreement Termination.

BMP Installation and Maintenance Standards:

- NR 328 *Shore Erosion Control Structures in Navigable Waterways*
- NRCS 580 *Streambank and Shoreline Protection*
- NRCS 395 *Stream Habitat Improvement and Management*
- NRCS 350 *Sediment Basin*

Restoration landscaping and seeding were installed following construction of these projects and have been closely monitored for two (2) growing seasons and will continue to be monitored to ensure the new seeding grows and erosion is not prevalent. The Village is also addressing weed and invasive vegetation growth when present as needed. The BMPs have and will continue to be inspected by Village staff following heavy rain events at a minimum. Inspection will be used to determine appropriate actions in order to maintain the inlet, outlets, riprap and other features for continuous and ongoing stormwater treatment and TP credit generation. The BMPs have and will continue to be inspected annually by a licensed Professional Engineer of Delta 3 Engineering to ensure that the BMPs are functioning as intended in order to meet the requirements of this WQT Plan. Please see Attachment #14 – Annual WQT Reports for BMP inspections.

V. Trade Timeline –

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

Table 5.1 – Trade Timeline

Item	Completion Date
Site Investigation	November 30, 2018
Conceptual Design	March 31, 2019
Final Design	December 31, 2020
Construction Permits	January 1, 2020
Construction of BMPs	June 1, 2021
Phosphorus Credit Registration	August 31, 2021
Use of Phosphorus Credits by Village of Wauzeka (Ongoing for Permit Compliance)	November 1, 2021

Credits have been used by the Village since 10/31/2021. Credits will continue as long as the trading practices are maintained as outlined in this WQT Plan.

VI. Inspection Reporting –

a. Tracking Procedures

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

b. Inspection

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

The inspection reports will include:

- i. Name and contact information of the inspector
- ii. Inspection Date
- iii. Relevant standards set forth in the Design Plan or Operation and Maintenance Plan
- iv. Issues identified
- v. When and how any issues identified were addressed
- vi. When and how any issues identified will be addressed in the future
- vii. Inspection photos of the BMPs (annually at a minimum)
- viii. Vegetative and Structural Condition

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

c. Management Practice Registration Form

The Village had filed a completed registration form 3400-207 for Water Quality Trading Management Practice Registration separately from this Plan.

d. Annual Water Quality Trading Report Submittal

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

- i. The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance;
- ii. A summary of the annual inspection of the practice that generated any of the pollutant reduction credits used during the previous year, this

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

e. Monthly Certification of Management Practices

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

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

f. Notification of Failure to Generate Credits

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

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

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

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

g. Conditions under which Management Practices May Be Inspected

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

VII. Certification –

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

Village of Wauzeka Wastewater Treatment Facility

By: Travis E Lomas

Travis Lomas
Village President
Village of Wauzeka
213B E. Front Street
P.O. Box 344
Wauzeka, WI 53826
Telephone: (608) 875-5281
Email: travlomas@yahoo.com

Attachment #1

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

Applicant Information

Permittee Name Village of Wauzeka		Permit Number WI- 0022276-09-0		Facility Site Number	
Facility Address 410 East Front Street			City Wauzeka	State WI	ZIP Code 53826
Project Contact Name (if applicable) Bart Nies (Delta 3 Eng.)		Address 875 South Chestnut Street		City Platteville	State WI
				State WI	ZIP Code 53818
Project Name					

Receiving Water Name Kickapoo River	Parameter(s) being traded Total Phosphorus	HUC 12(s) 070700060507
--	---	---------------------------

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

☐ Point source dominated
☒ Nonpoint source dominated

Credit Generator Information

Credit generator type (select all that apply):

☐ Permitted Discharge (non-MS4/CAFO)	☒ 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
☐ Unsure

Are any of the credit generators downstream of the applicant? ☐ Yes

☒ No
☐ Unsure

Will a broker/exchange be used to facilitate trade? ☐ Yes; Name: _____

☒ No
☐ Unsure

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

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

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Page 2 of 2

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

List the practices that will be used to generate credits:

Stream bank stabilization, Bioretention, Infiltration basin, Wet Detention Ponds, Street Sweeping etc.

The Village plans to implement site specific Best Management Practices (BMPs) in conjunction with SNAP-Plus and NRCS Erosion models to generate Phosphorus Trading Credits. The Village of Wauzeka intends to trade with stormwater projects performed on Village of Wauzeka properties. The Village will need to develop a trade agreement with the DNR for this trade.

Method for quantifying credits generated: ☐ Monitoring

☒ Modeling, Names: SNAP-Plus, NRCS Erosion Model

☐ Other: _____

Projected date credits will be available: 11/01/2021

The preparer certifies all of the following:

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

Signature of Preparer

Jordan Fune

Date Signed

2/11/19

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

L. J. Lundlach

Date Signed

2/13/19

Attachment #2

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

Applicant Information

Permittee Name Village of Wauzeka		Permit Number WI- 0022276-09-0		Facility Site Number	
Facility Address 410 East Front St.			City Wauzeka	State WI	ZIP Code 53826
Project Contact Name (if applicable) Jesse Mezera		Address 410 East Front St.		City Wauzeka	State WI
				State WI	ZIP Code 53826
Project Name Village of Wauzeka - Water Quality Trading for Total Phosphorus					
Receiving Water Name Kickapoo River		Parameter(s) being traded Total Phosphorus		HUC 12(s) 070700060507	

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 WDPES permit requirements? ☐ Yes
☐ No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				

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				☐ Yes ☐ No ☐ Only in part
☒ Urban NPS ☐ Agricultural NPS ☐ Other	Stormwater Infiltration	STEPL Model	N/A	☐ Yes ☒ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part

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

Water Quality Trading Checklist

Form 3400-208 (1/14)

Page 1 of 3

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 Village of Wauzeka		Permit Number WI- 0022276-09-0		Facility Site Number	
Facility Address 410 East Front St.			City Wauzeka	State WI	ZIP Code 53826
Project Contact Name (if applicable) Jesse Mezera		Address 410 East Front St.		City Wauzeka	State WI
				ZIP Code 53826	
Project Name Village of Wauzeka - Water Quality Trading for Total Phosphorus					
Receiving Water Name Kickapoo River		Parameter(s) being traded Total Phosphorus		HUC 12(s) 070700060507	

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 WDPES permit requirements? ☐ Yes
☐ No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				
☐ Traditional ☐ MS4 ☐ CAFO				

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	N/A	☐ Yes ☒ No ☐ Only in part
☐ Urban NPS ☒ Agricultural NPS ☐ Other	Sedimentation Basin	SnapPlus	N/A	☐ Yes ☒ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part
☐ Urban NPS ☐ Agricultural NPS ☐ Other				☐ Yes ☐ No ☐ Only in part

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

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 IV
i. Conditions under which the management practices may be inspected	☒ Yes ☐ No	Section VI
j. Reporting requirements should the management practice fail	☒ Yes ☐ No	Section VI
k. Operation and maintenance plan for each management practice	☒ Yes ☐ No	Section IV
l. Location of credit generator in proximity to receiving water and credit user	☒ Yes ☐ No	Section III
m. Practice registration documents, if available	☐ Yes ☒ No	
n. History of project site(s)	☒ Yes ☐ No	Section IV
o. Other: _____	☐ Yes ☐ No	

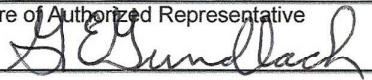
The preparer certifies all of the following:

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

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

Authorized Representative Signature

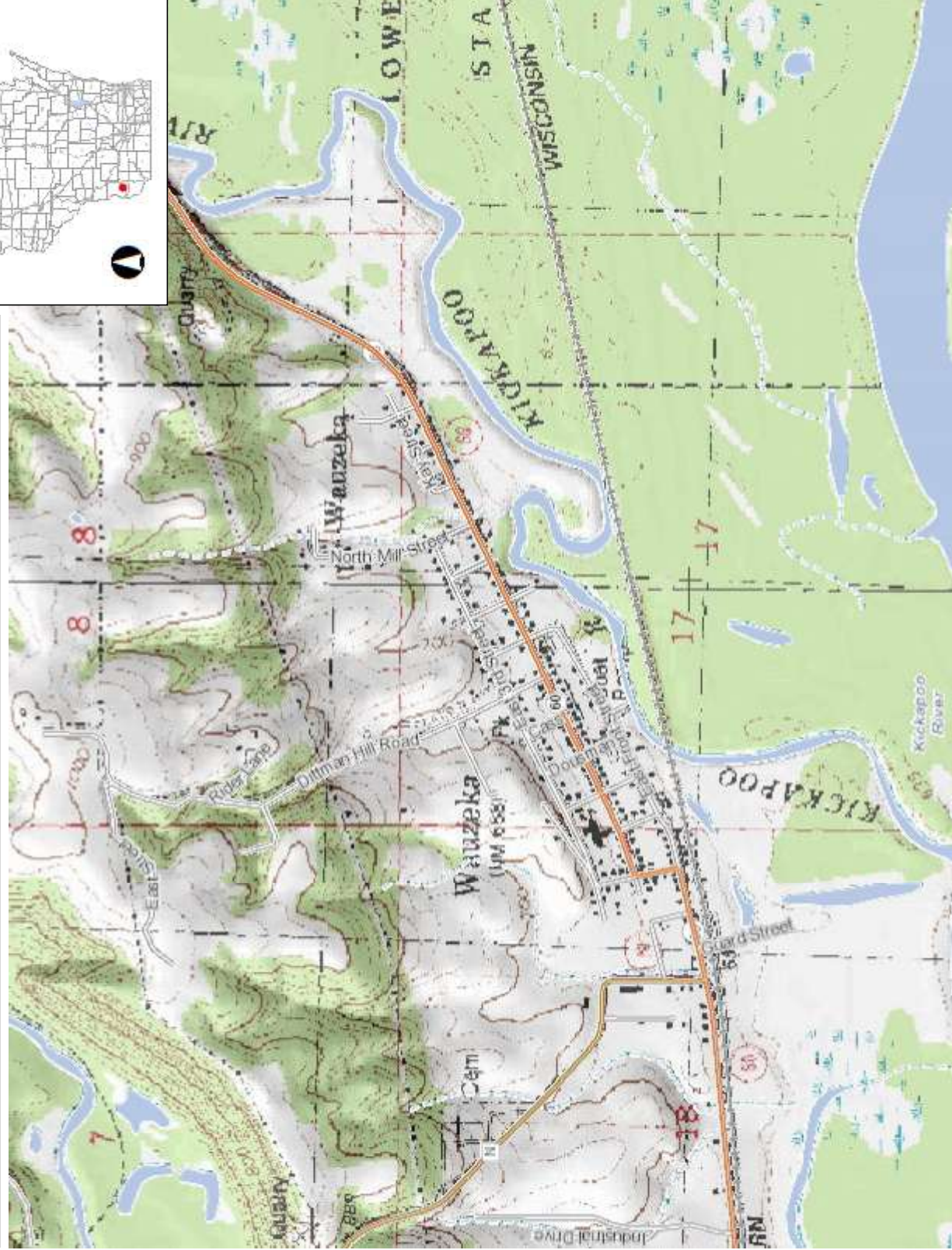
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. 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 8-13-19
--	------------------------

Attachment #3



Location Map



Legend

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

Notes

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

0.5 0 0.25 0.5 Miles

NAD_1983_HARN_Wisconsin_TM

1: 15,840

Attachment #4

SANITARY SEWER SYSTEM MAP VILLAGE OF WAUZEKA CRAWFORD COUNTY WISCONSIN

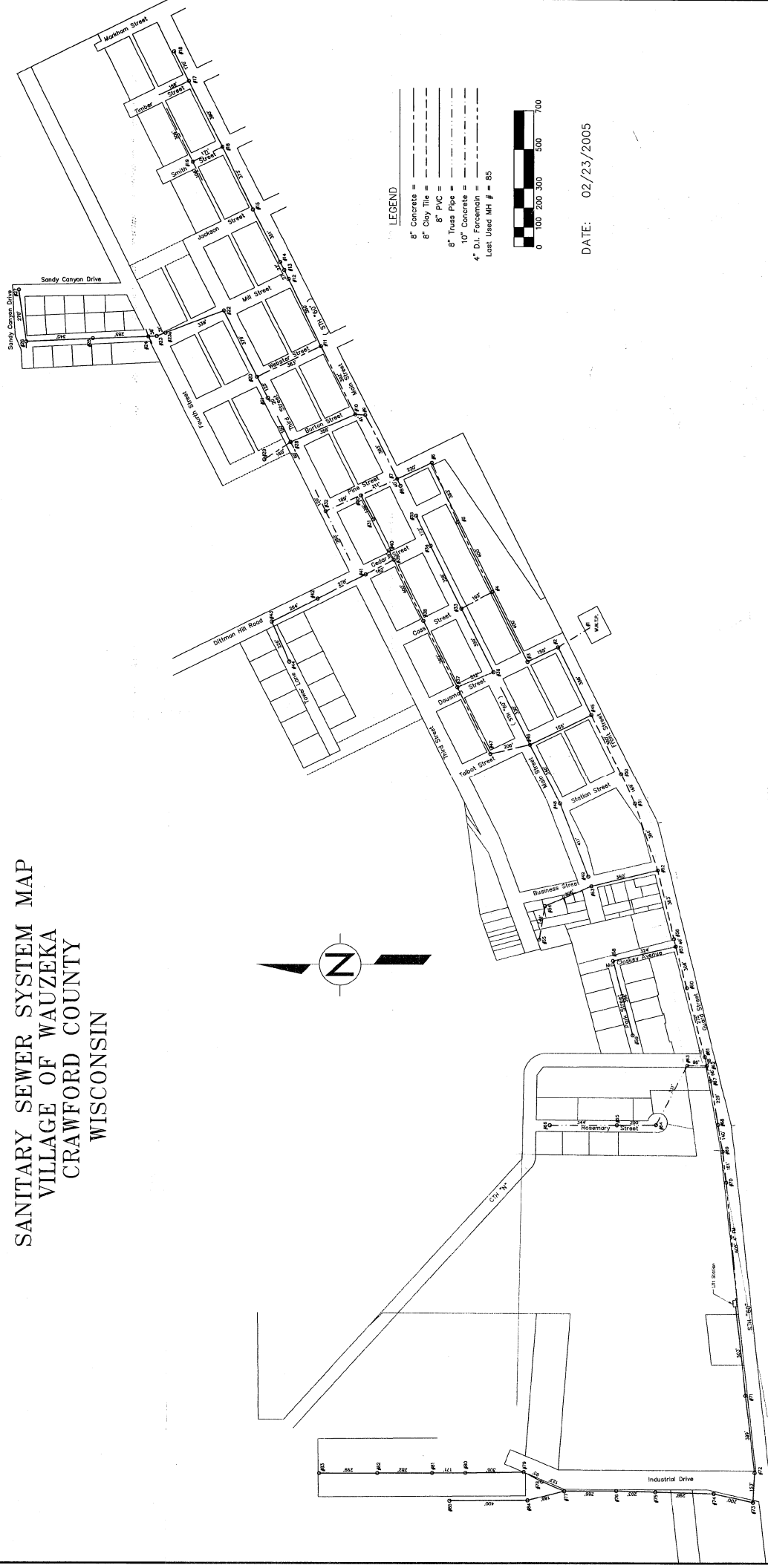


Exhibit 4 - Sanitary Sewer Map

Attachment #5



1# T1217x3

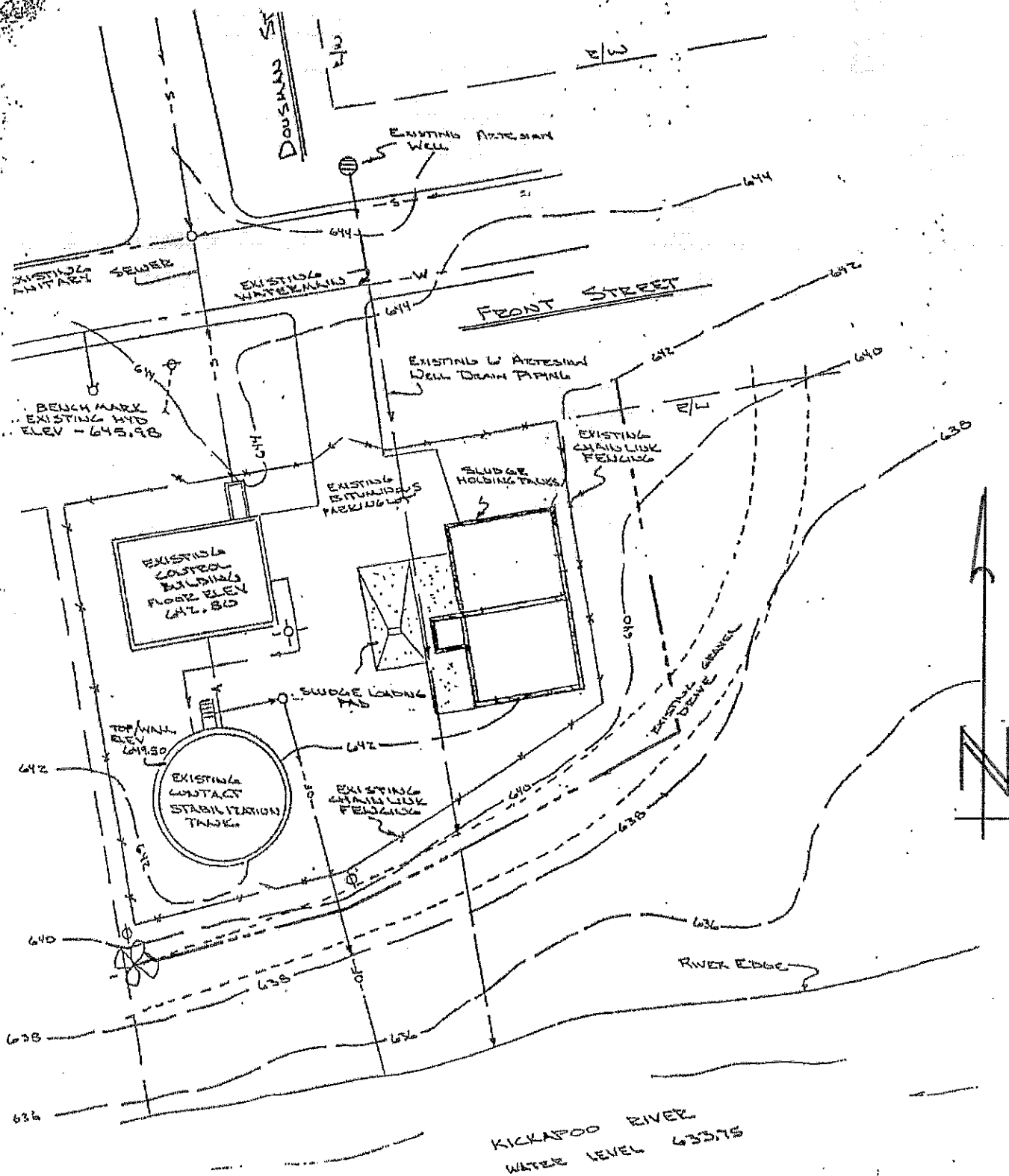


EXHIBIT #2
SITE PLAN
VILLAGE OF WAUZEKA

Attachment #6

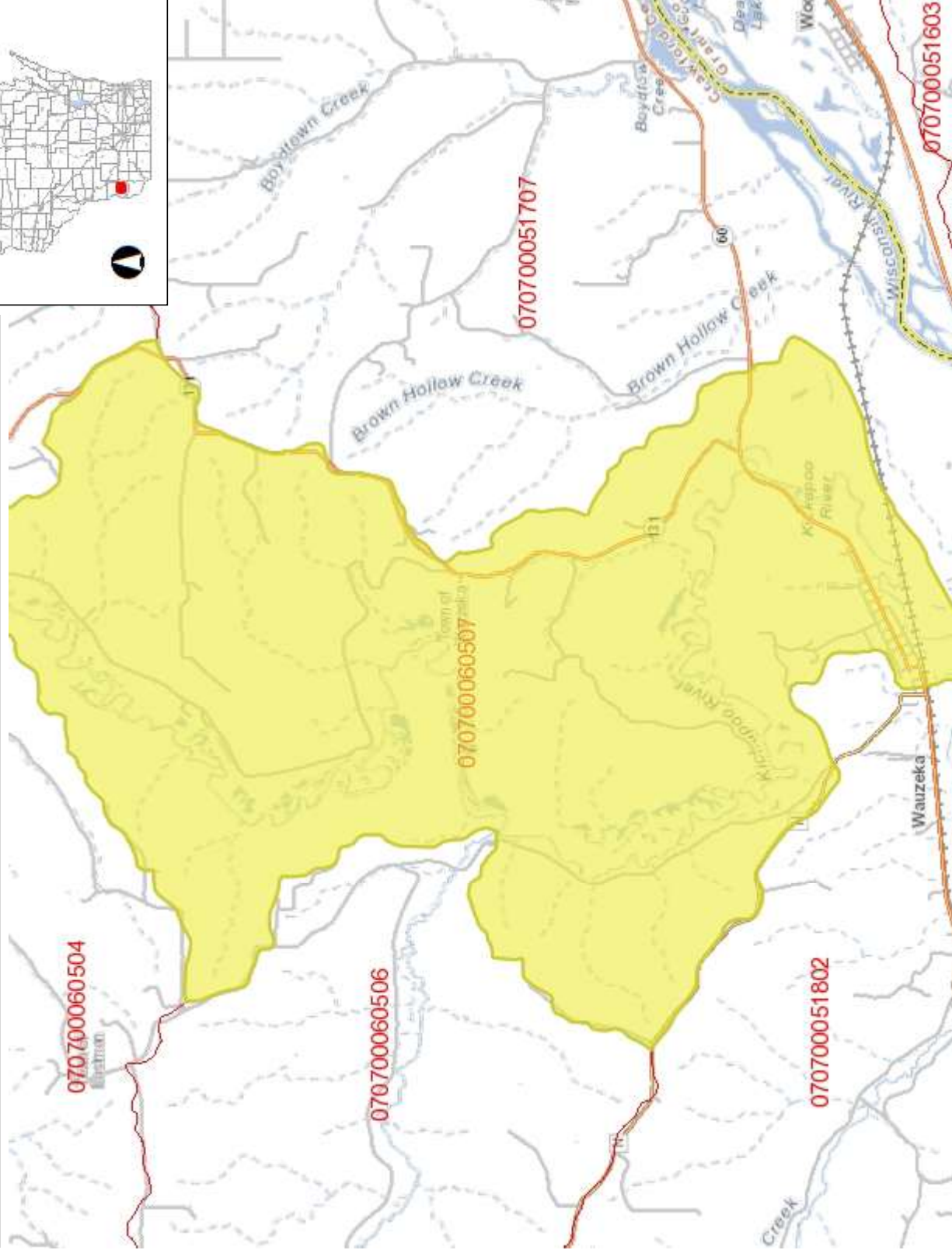


HUC-12 Watershed Map



Legend

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



Notes

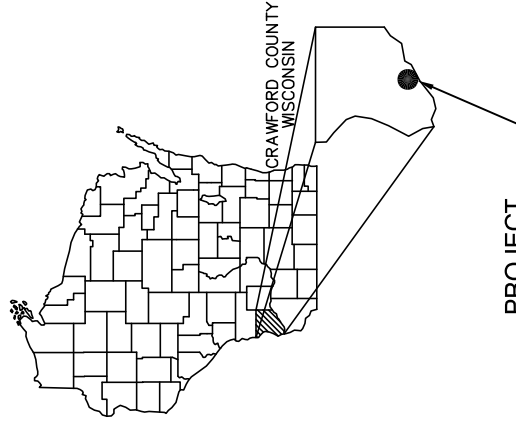
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No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

Attachment #7

SHEET INDEX

DESCRIPTION	SHEET NO.
TITLE SHEET	1
GENERAL NOTES	2
TYPICAL SECTIONS	3
MISC. QUANTITIES	4-5
WATERMAIN DETAILS	6
STANDARD DETAIL DRAWINGS	7-12
PLAN & PROFILE	13-14
CROSS SECTIONS	15-18

PLAN OF PROPOSED IMPROVEMENT **WAUZEKA HEIGHTS** VILLAGE OF WAUZEKA CRAWFORD COUNTY, WISCONSIN

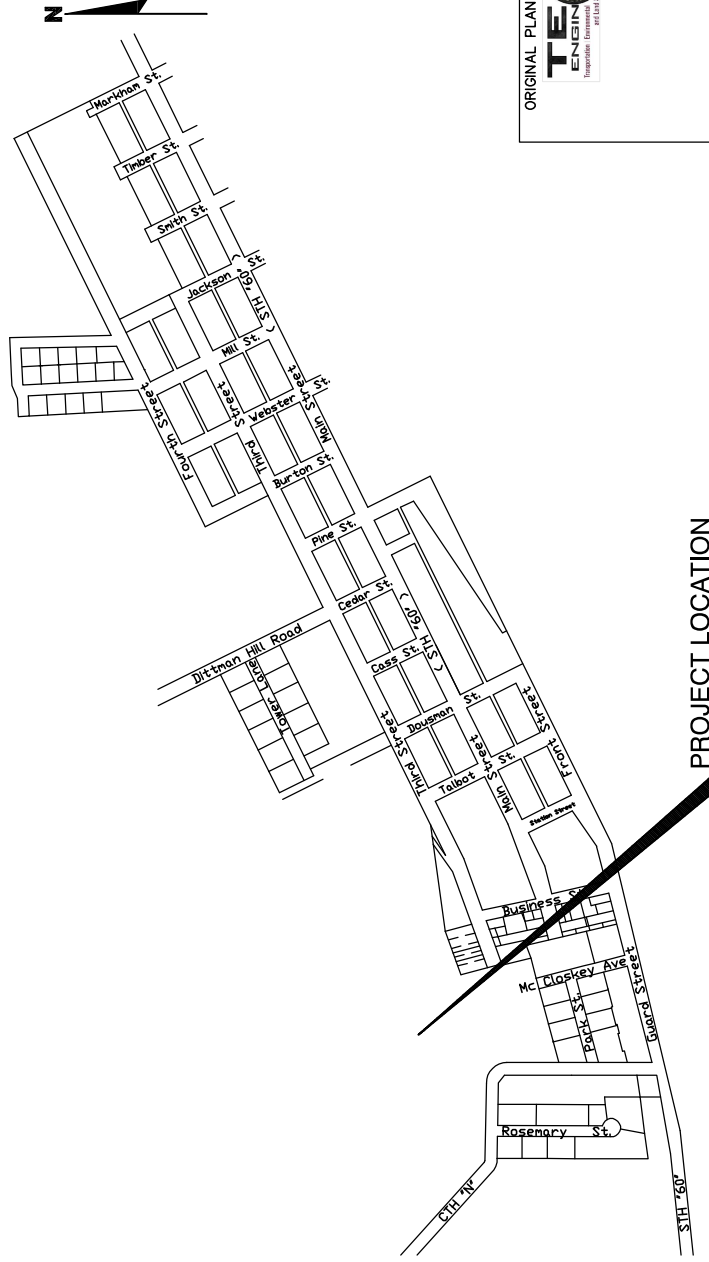


PROJECT
LOCATION

CONVENTIONAL SYMBOLS

- 6" S — SLOPE INTERCEPT
- 12" S — EXISTING SANITARY SEWER
- 12" ST — EXISTING STORM SEWER
- 6" W — EXISTING WATER MAIN
- 6" G — EXISTING GAS LINE
- TV — EXISTING BURIED CABLE TV
- E — EXISTING BURIED ELECTRIC
- T — EXISTING BURIED TELEPHONE
- 8" WM — EXISTING WATER MAIN
- 24" SS — EXISTING STORM SEWER
- 12" SS — EXISTING SANITARY SEWER
- COM — COMBUSTIBLE FLUIDS

- MARSH
- PROPOSED HYDRANT
- EXISTING HYDRANT
- PROPOSED VALVE
- 8" W — EXISTING VALVE
- EXISTING MANHOLE
- PROPOSED MANHOLE
- POWER POLE
- ELECTRIC PEDESTAL
- TELEPHONE PEDESTAL
- CABLE TV PEDESTAL
- TRAILLINE



PROJECT LOCATION

ORIGINAL PLANS PREPARED BY



(Date) (Signature)

Transportation - Environmental
 Agricultural - Municipal
 and Land Surveying



118 East Main Street
 Potosi, WI 53843
 Phone: (608) 788-5075

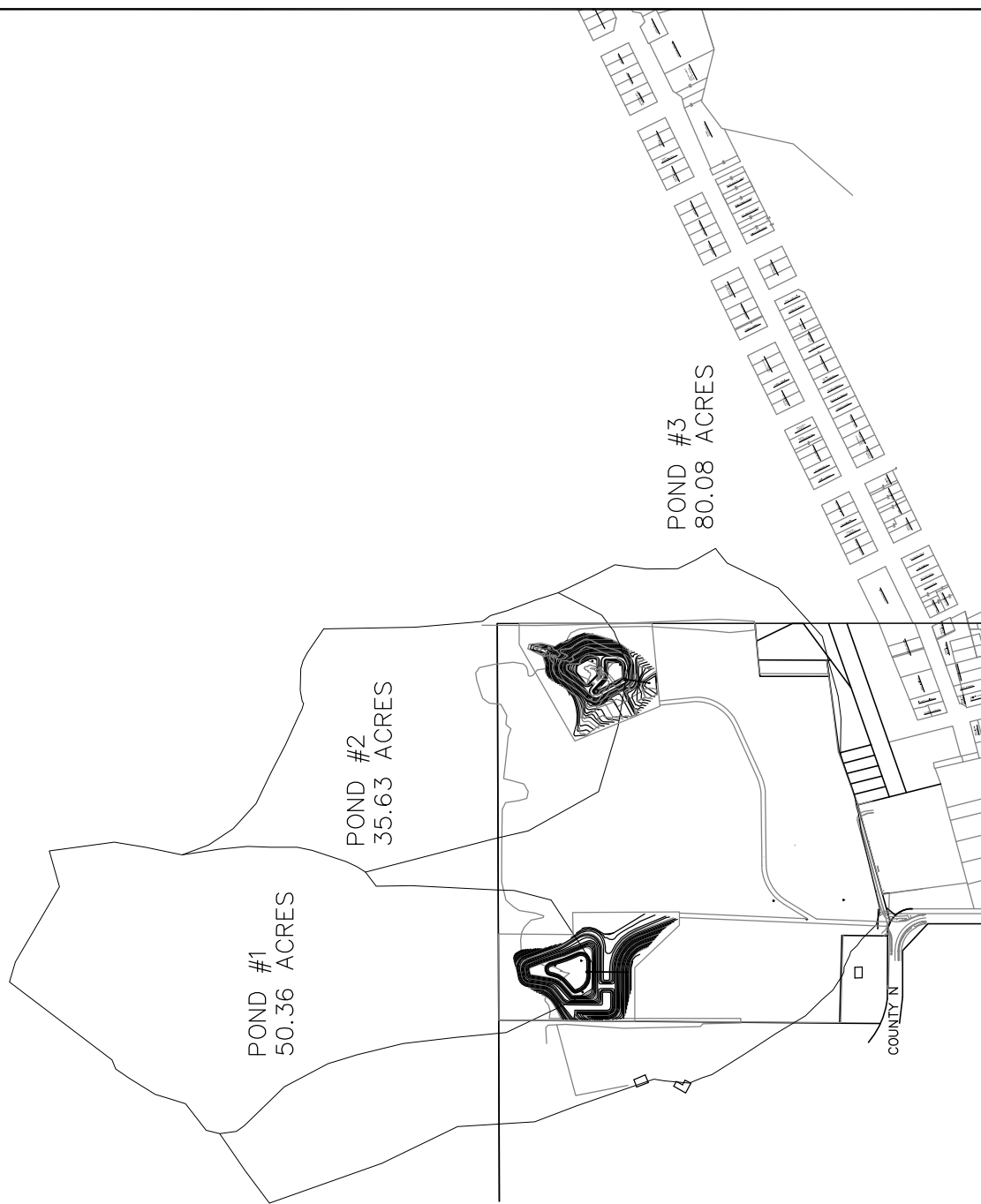
WAUZEKA HEIGHTS
 VILLAGE OF WAUZEKA
 CRAWFORD COUNTY, WISCONSIN

TITLE SHEET
 1 OF XX

REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME
			20-1794-1	TJB	JFK	3/23/20	TITLE SHEET



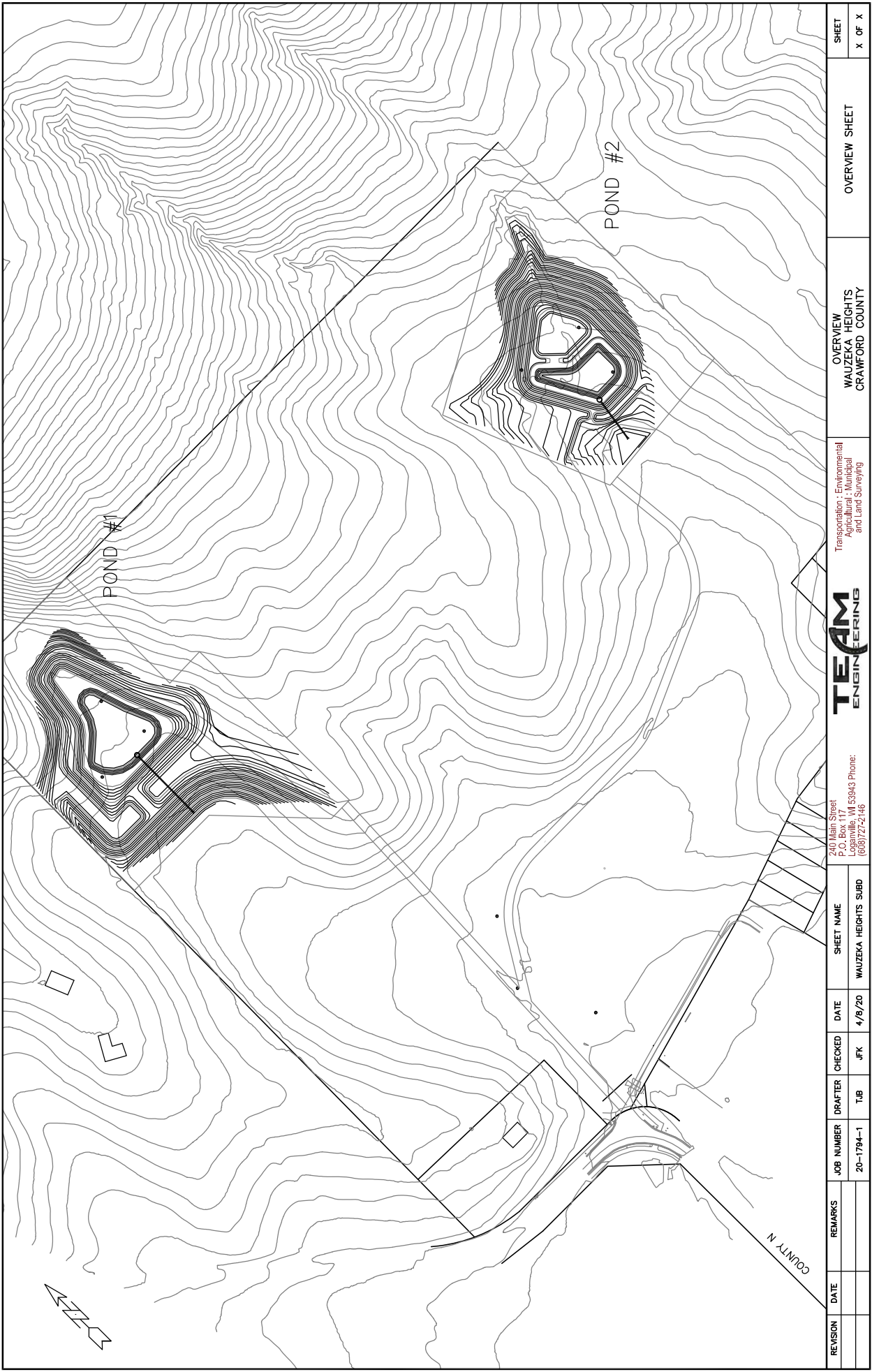
SCALE: 1" = 500'



REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME		TRANSPORTATION - ENVIRONMENTAL AGRICULTURAL - MUNICIPAL AND LAND SURVEYING	DRAINAGE OVERVIEW WAUZEKA HEIGHTS CRAWFORD COUNTY	DRAINAGE OVERVIEW SHEET		SHEET	
							20-1794-1	WAUZEKA HEIGHTS SUBD					X	OF X
			20-1794-1	T.B	JFK	4/8/20								



240 Main Street
P.O. Box 117
Logansville, WI 53943 Phone:
(608) 727-2146



Transportation - Environmental
Engineering
Agricultural - Municipal
and Land Surveying

TEAM
ENGINEERING

240 Main Street
P.O. Box 117
Logansville, WI 53943 Phone:
(608) 727-2146

SHEET NAME
WALZEKA HEIGHTS SUBD

DATE
4/8/20

CHECKED
JFK

DRAFTER
T.B.

JOB NUMBER
20-1794-1

REMARKS

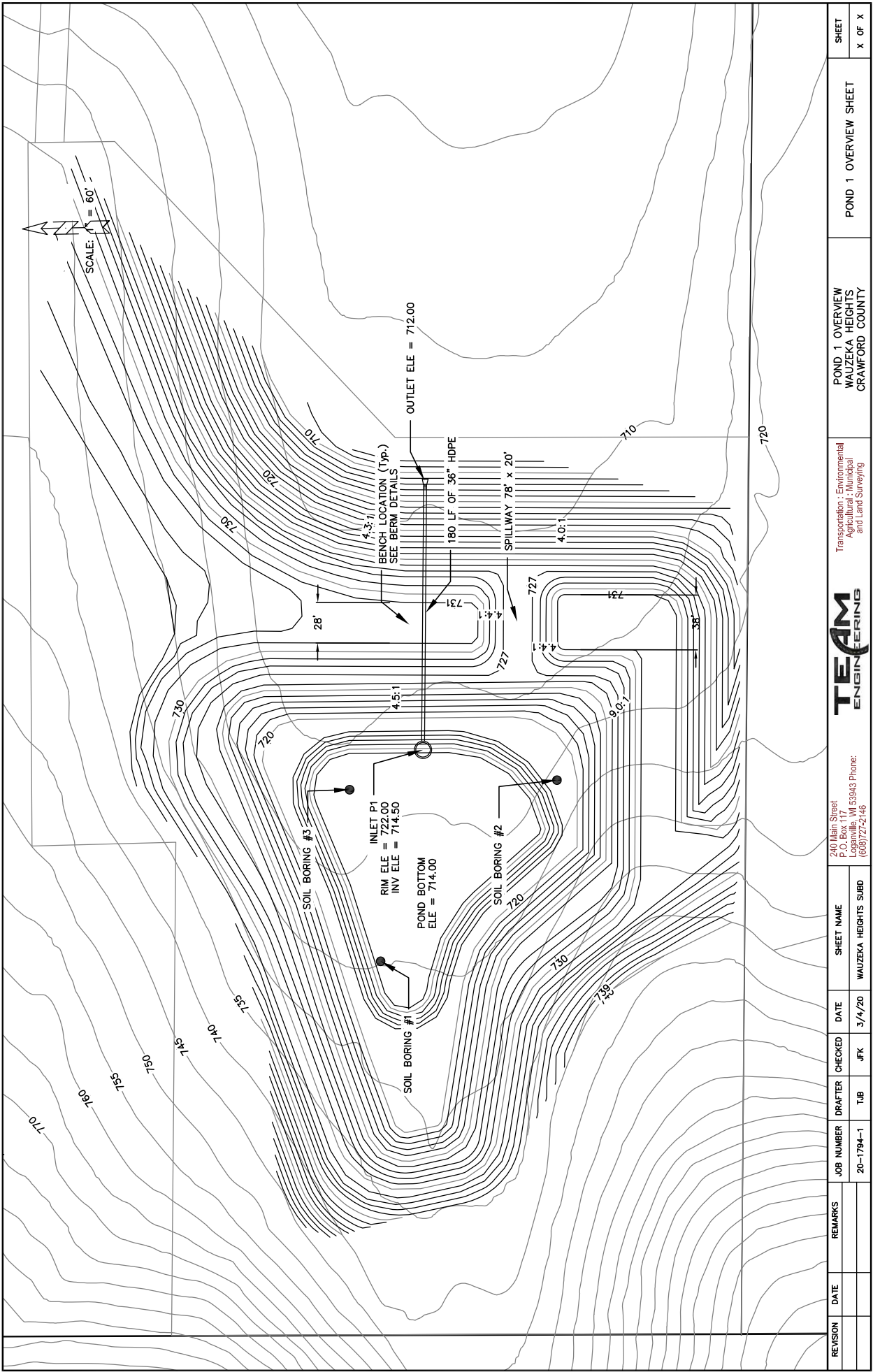
DATE

REVISION

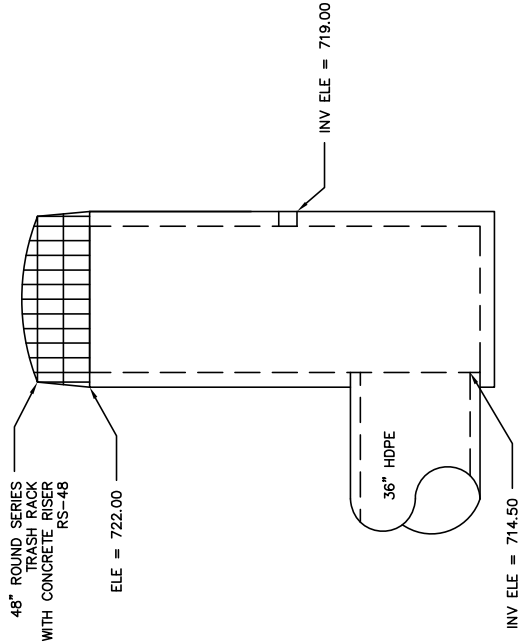
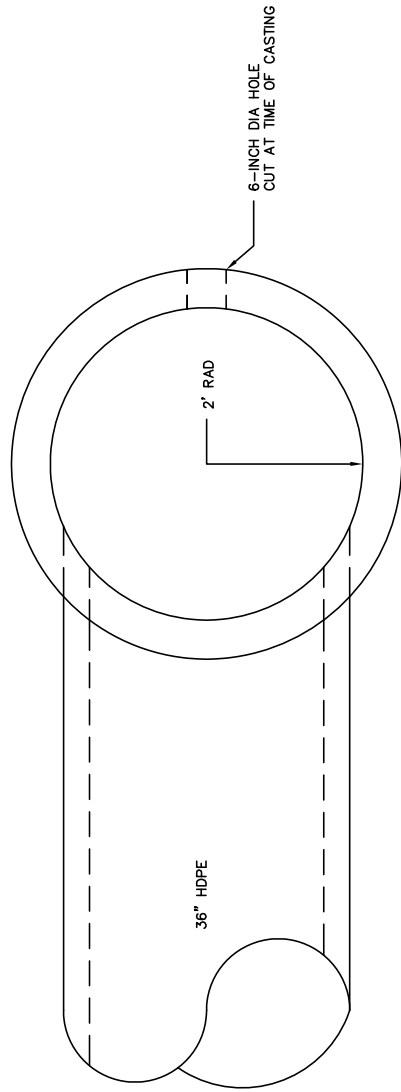
SHEET
X OF X

OVERVIEW SHEET

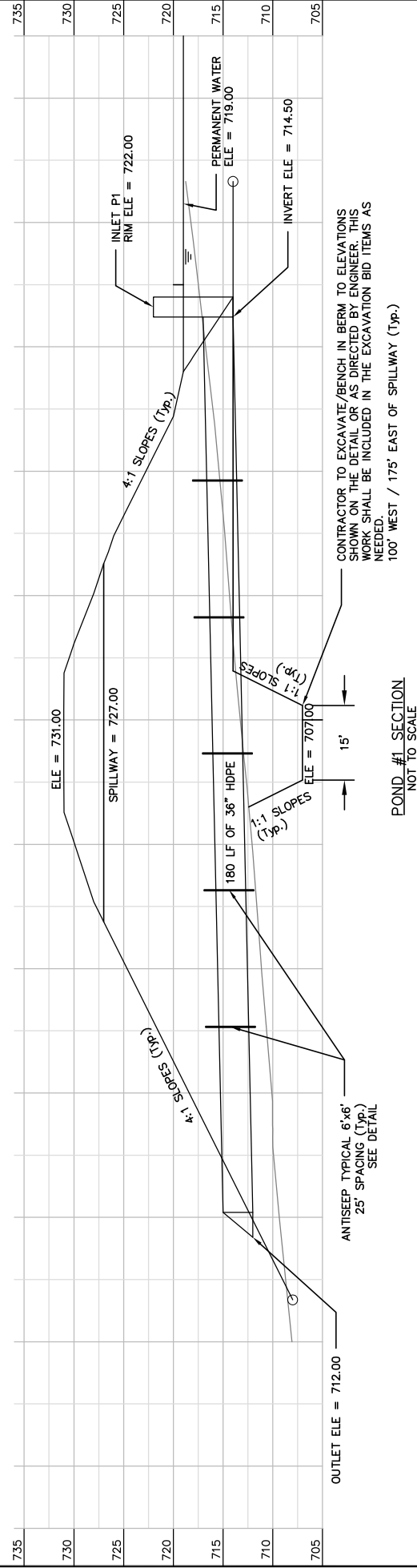
OVERVIEW
WALZEKA HEIGHTS
CRAWFORD COUNTY



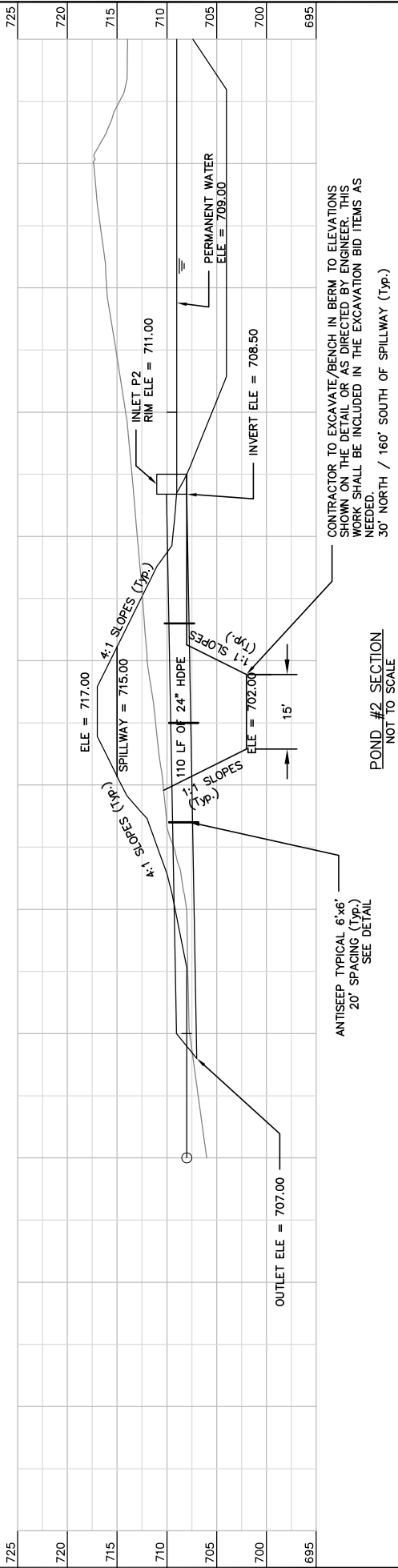
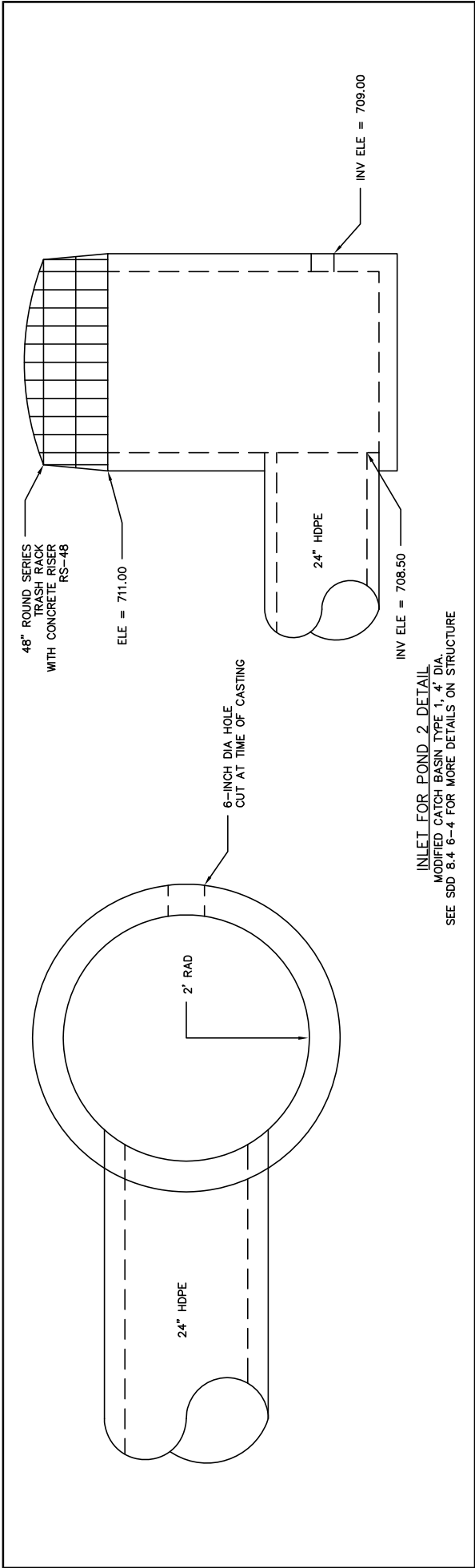
REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME	240 Main Street P.O. Box 117 Loganville, WI 53943 Phone: (608) 727-2146		TRANSPORTATION - ENVIRONMENTAL AGRICULTURAL - MUNICIPAL AND LAND SURVEYING	POND 1 OVERVIEW SHEET	SHEET X OF X
			20-1794-1	T.B.	JFK	3/4/20	WALZEKA HEIGHTS SUBD					



INLET FOR POND 1 DETAIL
MODIFIED CATCH BASIN TYPE 1, 4' DIA.
SEE SDD 8.4 6-4 FOR MORE DETAILS ON STRUCTURE



REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME		Transportation : Environmental Agricultural : Municipal and Land Surveying	POND #1 BERM DETAIL WAUZEKA HEIGHTS CRAWFORD COUNTY	POND #1 BERM DETAIL	SHEET X OF X
			20-1794-1	TJB	JFK	3/4/20						



REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME	SHEET
			20-1794-1	T.B.	JFK	3/4/20	POND #2 BERM DETAIL	X OF X
							POND #2 BERM DETAIL WAUZEKA HEIGHTS CRAWFORD COUNTY	X OF X

240 Main Street
P.O. Box 117
Logansville, WI 53943
(608) 727-4246

TEAM
ENGINEERING

Transportation - Engineering
Agricultural - Municipal
and Land Surveying

Plan View of Streambank Stabilization with Soil Sample Locations:



SCALE: N.T.S.

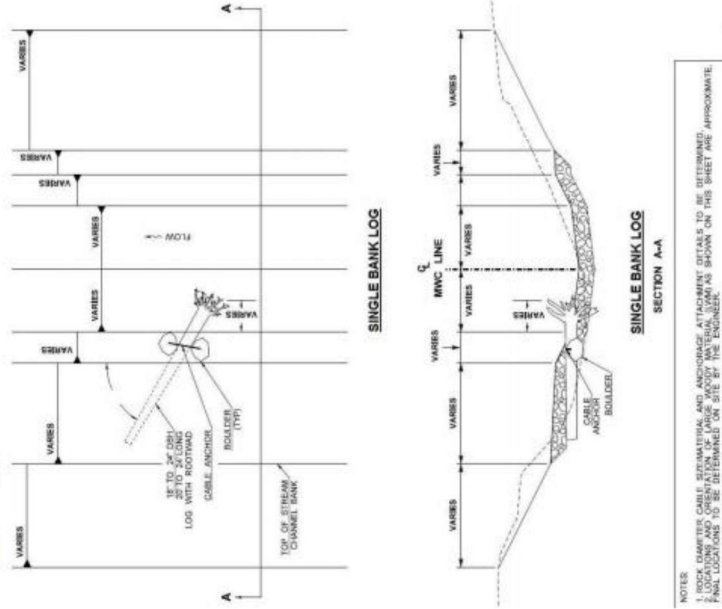
SCALE: N.T.S.

Typical In-Stream Habitat Improvement Details:

Single Bank Log

This is the simplest and generally most stable type of LWM placement, consisting of a single log with the stem buried in the bank and the root wad partially embedded in the streambed. This type of placement creates localized pool habitat, cover, and woody substrate on the margins of the channel while having minimal impacts on channel hydraulics and erosion. With sufficient overburden this type of placement may not require additional anchoring, but boulder anchors can be used to increase stability in situations with shallow burial depths.

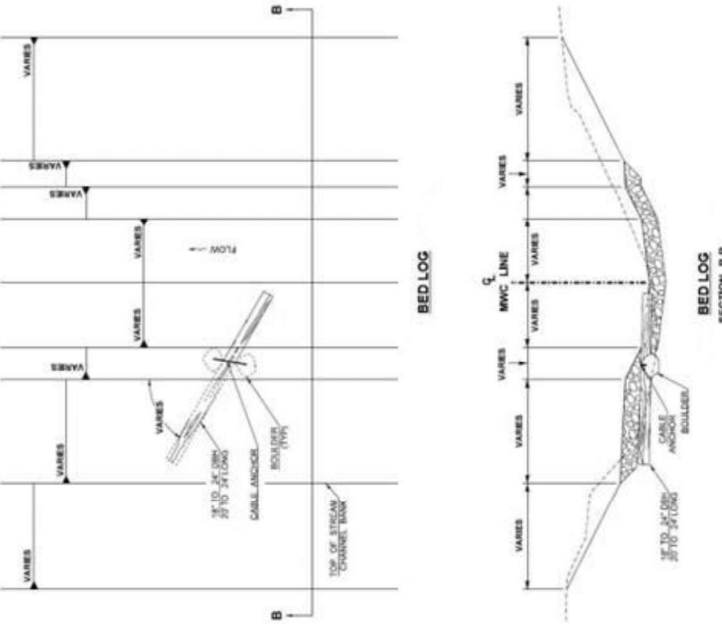
Figure 10C-1 Single Bank Log



Bed Log

This type of placement consists of a log without roots partially buried in the bed and extending out to the center of the channel. This low-profile placement of logs mimics tip-first delivery of logs to the stream by windthrow. These logs have high contact with the streambed and enhance streambed stability by encouraging sediment accumulation on the upstream side and flow deflection towards the center of the channel. A localized plunge pool may form on the downstream side of the log. The bed log is anchored by stem burial and boulders as needed.

Figure 10C-3 Bed Log





710 Commerce Drive
PO Box 169
Watertown, WI 53094

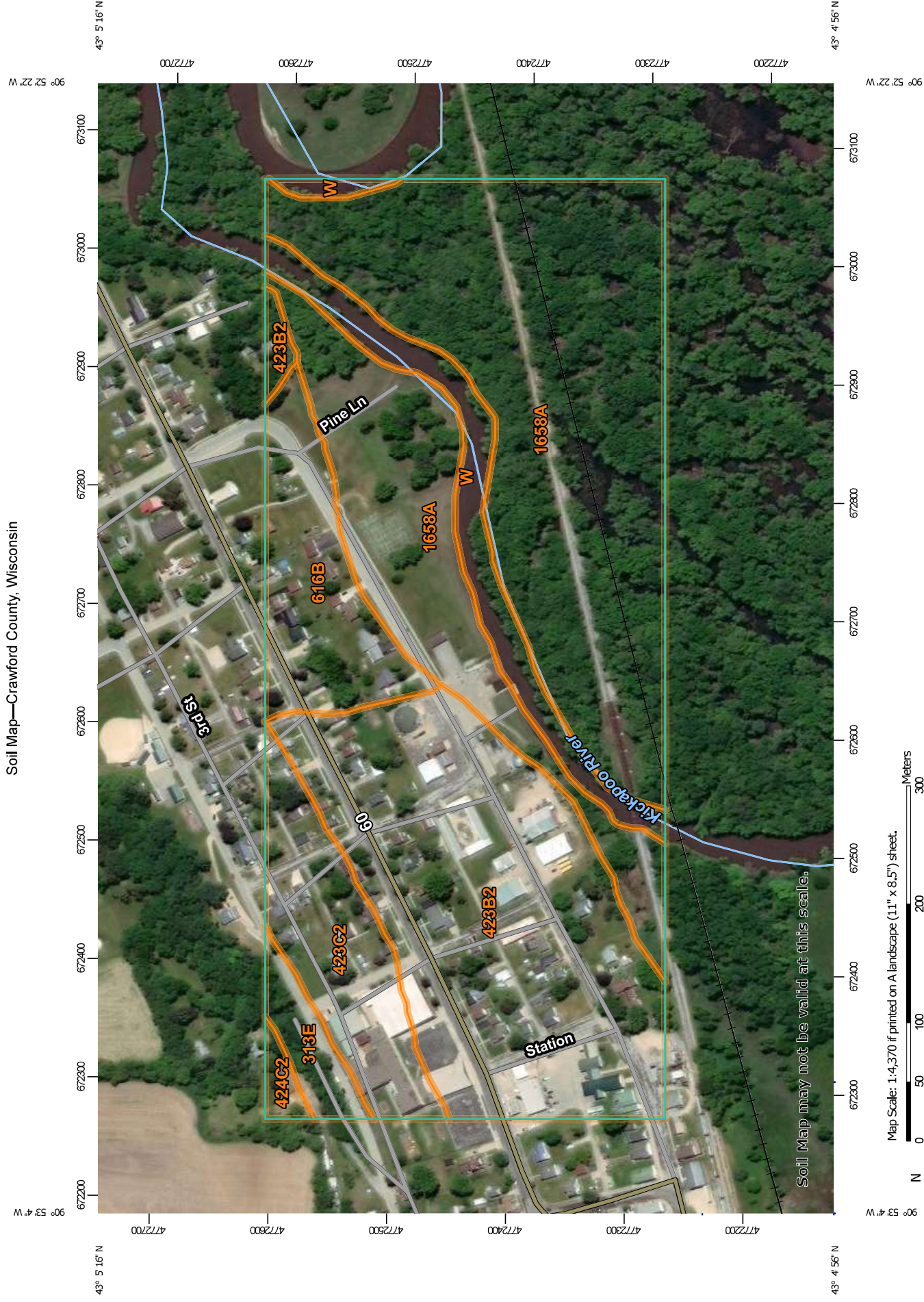
920-261-0446 phone
920-261-1365 fax
www.rockriverlab.com

Delta3 Engineering-Platteville Total Phosphorous Analysis 6/13/19

Field ID	Sample #	Total P (ppm)
Wauzeka-Kickapoo	1	608.8
Wauzeka-Kickapoo	3	308.6
Wauzeka-Kickapoo	5	519.5
Wauzeka-Kickapoo	7	494.1
Wauzeka-Kickapoo	9	661.9
Wauzeka-Kickapoo	11	576.8
Wauzeka-Kickapoo	13	687.7
Wauzeka-Kickapoo	15	578.9
Wauzeka-Kickapoo	17	616.2
Wauzeka-Kickapoo	19	483.0
Wauzeka-Kickapoo	21	567.2
Wauzeka-Kickapoo	23	562.1
Wauzeka-Kickapoo	25	356.4
Wauzeka-Kickapoo	27	588.7
Wauzeka-Kickapoo	29	335.2

Attachment #8

Soil Map—Crawford County, Wisconsin



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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

Spoil Area

Stony Spot

Stony Spot

Very Stony Spot

Very Stony Spot

Wet Spot

Wet Spot

Other

Other

Special Line Features

Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Crawford County, Wisconsin
Survey Area Data: Version 14, Jun 8, 2020

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

Date(s) aerial images were photographed: Sep 9, 2010—Jun 6, 2017

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
313E	Plumcreek silt loam, 20 to 45 percent slopes	1.4	2.2%
423B2	Meridian silt loam, 2 to 6 percent slopes, moderately eroded	18.4	27.8%
423C2	Meridian silt loam, 6 to 12 percent slopes, moderately eroded	5.3	7.9%
424C2	Merit silt loam, 6 to 12 percent slopes, moderately eroded	0.5	0.7%
616B	Chaseburg silt loam, 1 to 4 percent slopes, occasionally flooded	5.3	8.0%
1658A	Alganssee-Kalmarville complex, river valleys, 0 to 3 percent slopes, frequently flooded	31.2	47.0%
W	Water	4.2	6.4%
Totals for Area of Interest		66.4	100.0%

Soil Map—Crawford County, Wisconsin



006

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

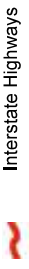
Sodic Spot

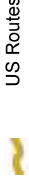
Water Features

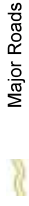
Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

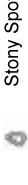
Background

Aerial Photography

Spoil Area

Spoil Area

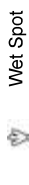
Stony Spot

Stony Spot

Very Stony Spot

Very Stony Spot

Wet Spot

Wet Spot

Other

Other

Special Line Features

Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.sc.egov.usda.gov>

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: Crawford County, Wisconsin

Survey Area Data: Version 14, Jun 8, 2020

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

Date(s) aerial images were photographed: Sep 9, 2010—Jun 6, 2017

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

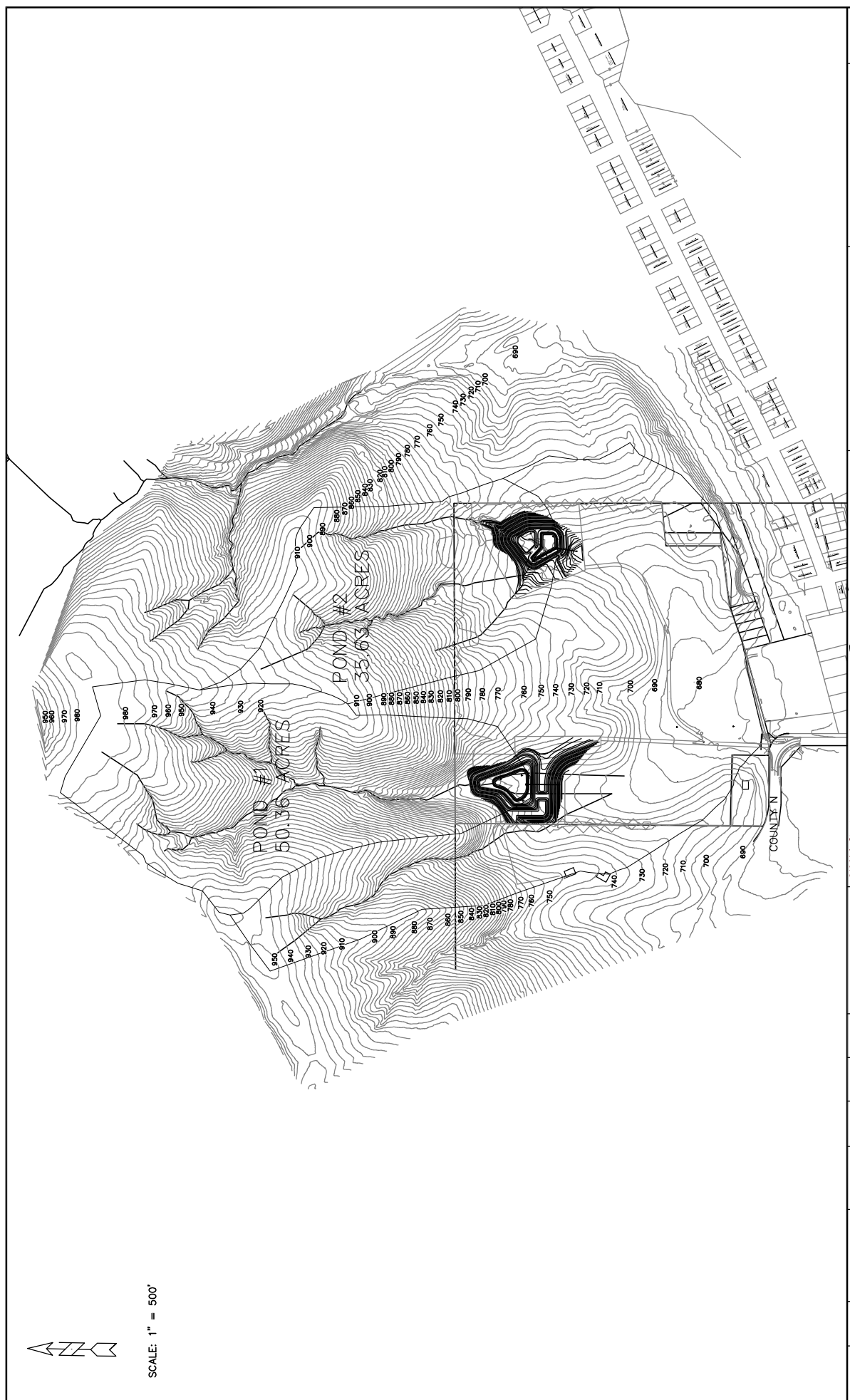
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
112B2	Seaton silt loam, 2 to 6 percent slopes, vfsI substratum, moderately eroded	0.4	0.1%
112C2	Seaton silt loam, 6 to 12 percent slopes, vfsI substratum, moderately eroded	18.1	2.7%
112D2	Seaton silt loam, 12 to 20 percent slopes, vfsI substratum, moderately eroded	30.4	4.5%
115B2	Seaton silt loam, driftless ridge, 2 to 6 percent slopes	10.8	1.6%
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded	63.2	9.4%
115D2	Seaton silt loam, driftless ridge, 12 to 20 percent slopes, moderately eroded	84.2	12.6%
115E2	Seaton silt loam, driftless ridge, 20 to 30 percent slopes, moderately eroded	14.7	2.2%
115vD2	Seaton silt loam, driftless valley, 12 to 20 percent slopes, moderately eroded	46.9	7.0%
115vE2	Seaton silt loam, driftless valley, 20 to 30 percent slopes, moderately eroded	0.9	0.1%
116D2	Churchtown silt loam, 12 to 20 percent slopes, moderately eroded	9.0	1.3%
116E2	Churchtown silt loam, 20 to 30 percent slopes, moderately eroded	2.4	0.4%
125D2	Pepin silt loam, 12 to 20 percent slopes, moderately eroded	18.1	2.7%
125E2	Pepin silt loam, 20 to 30 percent slopes, moderately eroded	54.9	8.2%
163E2	Elbaville silt loam, 20 to 30 percent slopes, moderately eroded	39.7	5.9%
164E	Elizabeth flaggy silt loam, 20 to 30 percent slopes	6.7	1.0%
312B2	Festina silt loam, 1 to 6 percent slopes, moderately eroded	6.7	1.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
313E	Plumcreek silt loam, 20 to 45 percent slopes	28.8	4.3%
423C2	Meridian silt loam, 6 to 12 percent slopes, moderately eroded	0.0	0.0%
424C2	Merit silt loam, 6 to 12 percent slopes, moderately eroded	1.0	0.2%
433B	Forkhorn sandy loam, 2 to 6 percent slopes	1.8	0.3%
601C	Beavercreek cobbly fine sandy loam, 3 to 12 percent slopes, occasionally flooded	1.2	0.2%
616B	Chaseburg silt loam, 1 to 4 percent slopes, occasionally flooded	14.9	2.2%
626A	Arenzville silt loam, 0 to 3 percent slopes, occasionally flooded	1.0	0.2%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	87.4	13.0%
1145F	Gaphill-Rockbluff complex, 30 to 60 percent slopes	23.6	3.5%
1648A	Northbend-Ettrick silt loams, 0 to 3 percent slopes, frequently flooded	92.8	13.8%
W	Water	10.5	1.6%
Totals for Area of Interest		670.1	100.0%

Attachment #9



SCALE: 1" = 500'



REVISION	DATE	REMARKS	JOB NUMBER	DRAFTER	CHECKED	DATE	SHEET NAME	TEAM ENGINEERING		TRANSPORTATION - ENVIRONMENTAL AGRICULTURAL - MUNICIPAL AND LAND SURVEYING	DRAINAGE OVERVIEW WALUZEKA HEIGHTS CRAWFORD COUNTY	SHEET
			20-1794-1	T.B.	JFK	4/8/20	WALUZEKA HEIGHTS SUBD	240 Main Street P.O. Box 117 Logansville, WI 53943 (608) 727-4246	Phone:			X OF X

Attachment #10

NRCS Streambank and Irrigation Ditch Erosion Estimator (Direct Volume Method)	
Farmer / Cooperator Name:	Village of Wauzeka
Tract Number:	Varies
Evaluated By:	J. Fure
Evaluation Date:	October 9, 2020

Field Number	Eroding Strmbnk Reach #; or Ditch Side/Bottom	Eroding Bank or Ditch Length (Feet)	Eroding Bank Height; or Ditch Bottom Width* (Feet)	Area of Eroding Strmbank or Ditch (FT ²)	Lateral or Ditch Bottom Recession Rate (Estimated) (FT / Year)	Estimated Volume (FT ³) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT ³	Estimated Soil Loss (Tons/Year)	Soil Total Phosphorus (ppm)	Estimated Phosphorus Loss (Pounds/Year)
Varies	A	810	4.70	3,807	0.30	1,142.1	Fine Sandy Loam	100	57.1	557.4	63.7
	B	325	5.00	1,625	0.20	325.0	Fine Sandy Loam	100	16.3	563.1	18.3
	C	240	4.30	1,032	0.30	309.6	Fine Sandy Loam	100	15.5	479.0	14.8
TOTAL						1776.7			88.8		96.8

Report: Term: Dec:

Device: Var:

Variable	OVERALL	Pond #1	Forebay Pond	Pond #2
Clay	49.4	47.9	17.7	40.9
Silt	81.7	77.4	58.1	69.1
TSS	81.7	77.4	58.1	69.1
TP	57.9	55.6	28.3	45.3
TKN	55.4	53.4	25.3	43.9
CU	55.4	53.4	25.3	43.9
PB	64.0	61.2	36.0	49.3
ZN	55.4	53.4	25.3	43.9
HC	64.0	61.2	36.0	49.3

Screen Capture #1 – Clay and Silt Load Reduction Percent

Device Name

Type

Outflow Devices

Normal

Overflow

Infiltration

Particle Removal Scale Factor

Detention Pond Parameters

Bottom Elev Ft

Area Acres

Volume Ac-Ft

Infilt Rate In/hr

Bottom

Permanent Pool

Flood Pool

Perm Pool Outlet Type

Orifice Diameter (inches)

Orifice Discharge Coef

Screen Capture #2 – Pond #1 Inputs

Device Name Pond #2		Detention Pond Parameters			
Type POND		Bottom Elev Ft 714			
Outflow Devices		Area Acres	Volume Ac-Ft	Infiltr Rate In/hr	
Normal	*OUT*	Bottom	0.148		
Overflow	*OUT*	Permanent Pool	0.308	1.54	0
Infiltration	*OUT*	Flood Pool	1.098	6.588	0
Particle Removal Scale Factor 1		Perm Pool Outlet Type ORIFICE			
		Orifice Diameter (inches) 24			
		Orifice Discharge Coef 1			

Screen Capture #3 – Pond #2 Inputs

Device Name Forebay Pond		Detention Pond Parameters			
Type POND		Bottom Elev Ft 708			
Outflow Devices		Area Acres	Volume Ac-Ft	Infiltr Rate In/hr	
Normal	Pond #2	Bottom	0.174		
Overflow	Pond #2	Permanent Pool	0.222	0.333	0
Infiltration	*OUT*	Flood Pool	0	0	0
Particle Removal Scale Factor 1		Perm Pool Outlet Type WEIR			
		Weir Length (ft) 5			
		Weir Discharge Coef 3.15			

Screen Capture #4 – Forebay Connected to Pond #2 Inputs

Watershed Name	SubCat #1 (Minus Fields #4/#5)	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	30.25	
Pervious Area Curve Number	64	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmd)	101	1231

Screen Capture #5 – Sub-catchment #1 Inputs

Watershed Name	SubCat #3	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	3.74	
Pervious Area Curve Number	60	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #6 – Sub-catchment #3 Inputs

Watershed Name	SubCat #4	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	2.77	
Pervious Area Curve Number	60	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #7 – Sub-catchment #4 Inputs

Watershed Name	SubCat #10 (Minus Field #8)	
Outflow Device for Surface Runoff	Forebay Pond	
Outflow Device for Percolation	None	
Total Area (acres)	13.6	
Pervious Area Curve Number	66	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #8 – Sub-catchment #10 Inputs

Watershed Name	SubCat #12 (Minus Field #6)	
Outflow Device for Surface Runoff	Forebay Pond	
Outflow Device for Percolation	None	
Total Area (acres)	6.9	
Pervious Area Curve Number	63	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #9 – Sub-catchment #12 Inputs

Watershed Name	Field #4	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	2.1	
Pervious Area Curve Number	74	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #10 – Sub-catchment Field #4 Inputs

Watershed Name	Field #5	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	11.5	
Pervious Area Curve Number	74	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #11 – Sub-catchment Field #5 Inputs

Watershed Name	Field #6	
Outflow Device for Surface Runoff	Forebay Pond	
Outflow Device for Percolation	None	
Total Area (acres)	5.5	
Pervious Area Curve Number	74	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #12 – Sub-catchment Field #6 Inputs

Watershed Name	Field #7	
Outflow Device for Surface Runoff	Pond #1	
Outflow Device for Percolation	None	
Total Area (acres)	2.1	
Pervious Area Curve Number	74	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #13 – Sub-catchment Field #7 Inputs

Watershed Name	Field #8	
Outflow Device for Surface Runoff	Forebay Pond	
Outflow Device for Percolation	None	
Total Area (acres)	9.6	
Pervious Area Curve Number	74	
Indirectly Connected Imperv. Fraction	0	
Scale Fractor for Particle Loads	1	
Directly Connected Impervious Area Type	Vacuum Swept	Not Swept
Connected Impervious Fraction	0	0
Depression Storage (inches)	0.018	0.018
Impervious Runoff Coef	1	1
Scale Factor for Particle Loads	1	1
Impervious Sweep Frequency (1/wk)	0	
Sweeping Efficiency Scale Factor	1	
	Start	Stop
Vacuum Sweeping Season (mmdd)	101	1231

Screen Capture #14 – Sub-catchment Field #8 Inputs

Particle Parameters

Help

Save File

Read File

Check

Cancel

OK

Particle File Name

nurp50.p8p

Particle Set Description

NURP Particle Distribution - 50th Percentiles

Size Fraction	1	2	3	4	5
Description	Clay	Silt			
Accumulation Rate (lbs/ac-day)	0.75	3.15			
Accum Decay Rate (1/day)	0	0			
Washoff Coefficient	100	100			
Washoff Exponent	1	1			
Sweeper Efficiency (%)	0	0			
Impervious Runoff Conc (ppm)	0	0			
Pervious Runoff Conc (ppm)	50	460			
Pervious Runoff Exponent	1	1			
Settling Velocity (ft/hr)	0.0366	0.945			
1st Order Decay Rate (1/day)	0	0			
2nd Order Decay Rate (1/d-ppm)	0	0			
Filtration Efficiency (%)	100	100			

Screen Capture #15 – Particle adjustment for Clay and Silt Particles

Percent Load Reduction

	Pond #1	Pond #2 Forebay	Pond #2
Clay	47.9	17.7	40.9
Silt	77.4	58.1	69.1

Load Delivery (ton/yr)

	Pond #1	Pond #2 Forebay	Pond #2
Clay	40	25	25
Silt	155	119	119

Load Capture (ton/yr)

	Pond #1	Pond #2 Forebay	Pond #2
Clay	19	4	10
Silt	120	69	82

Soil TP Concentration (ppm)

	Pond #1	Pond #2 Forebay	Pond #2
Soil TP	484	569	569

Particulate Phosphorus Captured (PPC) (lbs/yr) =

	Pond #1	Pond #2 Forebay	Pond #2
PPC	172	94	128

$$\text{PPC} = [(\text{Clay retained} \times \text{TPS} \times 3.0) + (\text{Silt retained} \times \text{TPS} \times 1.0) \times 0.002]$$

Name	Size ac	Avg Fall		Avg Spring		Avg Summer		Avg Delivery		Avg Delivery		Distance to Pond ft	Percent Delivery	Delivered Silt and Clay t/ac/yr		Delivered Clay t/ac/yr		Delivered Silt t/ac/yr		Total Delivered Soil Loss t/yr
		CN	CN	CN	CN	CN	CN	Soil Loss t/ac/yr	Clay t/ac/yr	Silt t/ac/yr	Clay and Silt t/ac/yr			Proportion Clay						
Field #1	18.7	69.2	73.8	79.0	79.0	79.0	79.0	7.73	0.35	3.58	3.93									
Field #2	8.5	69.2	73.8	79.0	79.0	79.0	79.0	7.73	0.35	3.58	3.93									
Field #3	15.6	69.2	73.8	79.0	79.0	79.0	79.0	7.73	0.35	3.58	3.93									
Field #4	2.1	69.2	73.8	79.0	79.0	79.0	79.0	7.73	0.35	3.58	3.93	1915	29%	1.14	0.35	0.79		2.4		
Field #5	11.5	69.3	73.9	79.1	79.1	79.1	79.1	31.85	1.44	12.75	14.19	1040	29%	4.11	1.44	2.68		47.3		
Field #6	5.5	69.2	73.8	79.0	79.0	79.0	79.0	19.79	0.89	8.17	9.06	1475	29%	2.63	0.89	1.73		14.5		
Field #7	2.1	69.2	73.8	79.0	79.0	79.0	79.0	5.27	0.78	8.17	8.96	0	80%	7.17	0.78	6.38		15.1		
Field #8	9.6	69.3	73.9	79.1	79.1	79.1	79.1	19.60	0.77	7.84	8.61	0	80%	6.89	0.77	6.12		66.1		

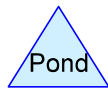
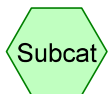
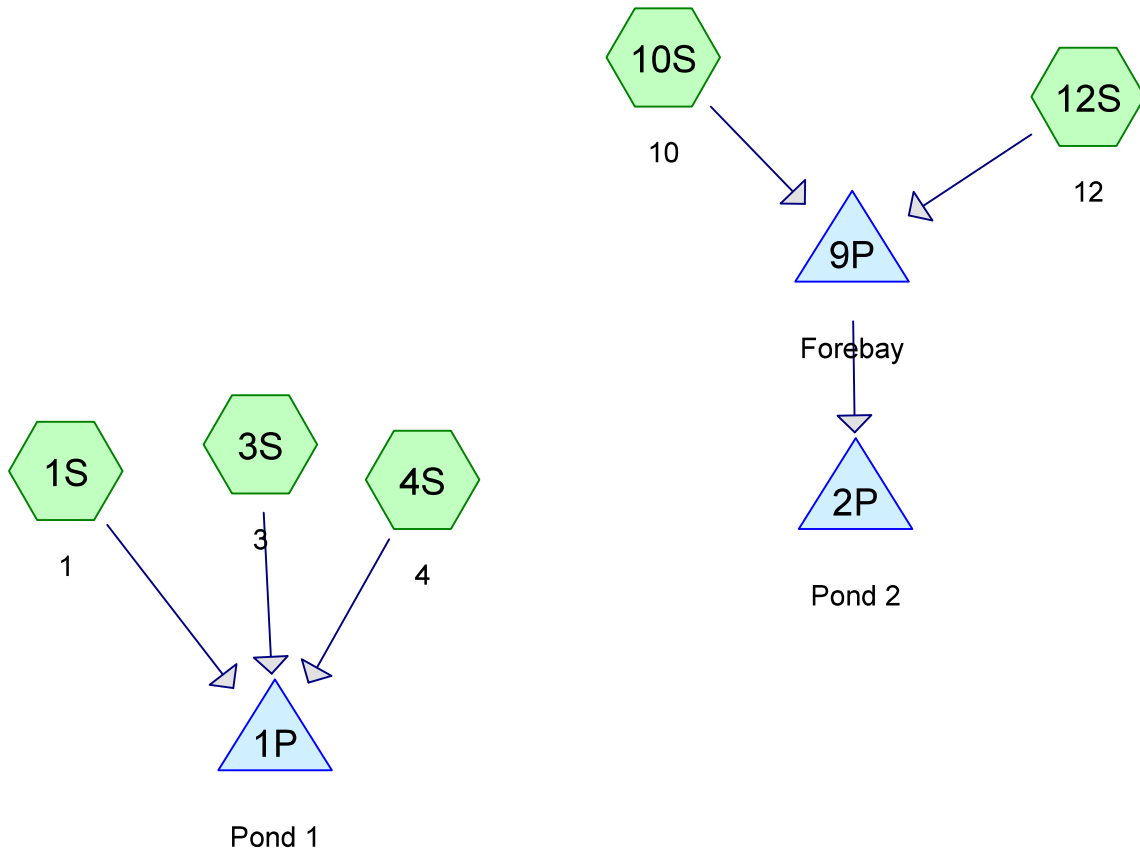
Composition of Sediment at Detachment:

Seg. Sediment Classes						
Composite segment	Clay sed class, %	Silt sed class, %	Sand sed class, %	Sm aggr sed class, %	Lg aggr sed class, %	
1	5.0	46	2.3	30	16	

How Delivery of Silt+Clay is Calculated in SnapPlus

RUSLE2 Soil Characteristics			
	Diameter	Fall Velocity	Specific Gravity
Clay	mm	m/sec	2.6
Silt	0.002	0.0000031	
	0.01	0.00008	2.7

Percentage of RUSLE2 silt + clay delivered to water					
SnapPlus Distance to Water Ranges (ft)	Distance used in SDR equations (ft)		Percentage of RUSLE2 silt + clay delivered to water		
	0-300	300-1000	1000-5000	5000-10000	10000-20000
0-300	300	86	25% Clay	83	80
301-1000	1000	75	69	66	66
1001-5000	5000	45	35	29	29
5001-10000	10000	32	22	16	16
10001-20000	20000	19	12	8	8
More than 20000	30000	17	7	0	0



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MSE 24-hr 4 1-Year Rainfall=2.59"

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Page 2

Summary for Subcatchment 1S: 1

Runoff = 4.42 cfs @ 13.11 hrs, Volume= 1.106 af, Depth= 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.59"

Area (ac)	CN	Description
31.850	60	Woods, Fair, HSG B
12.000	73	Row crops, C&T + CR, Poor, HSG B
43.850	64	Weighted Average
43.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	296	0.0661	0.30		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
1.2	151	0.1766	2.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	175	0.1475	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	123	0.0885	0.74		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
15.3	701	0.0930	0.76		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.8	352	0.0577	0.60		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.6	393	0.1585	1.00		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.2	312	0.0513	0.57		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
63.1	2,503	Total			

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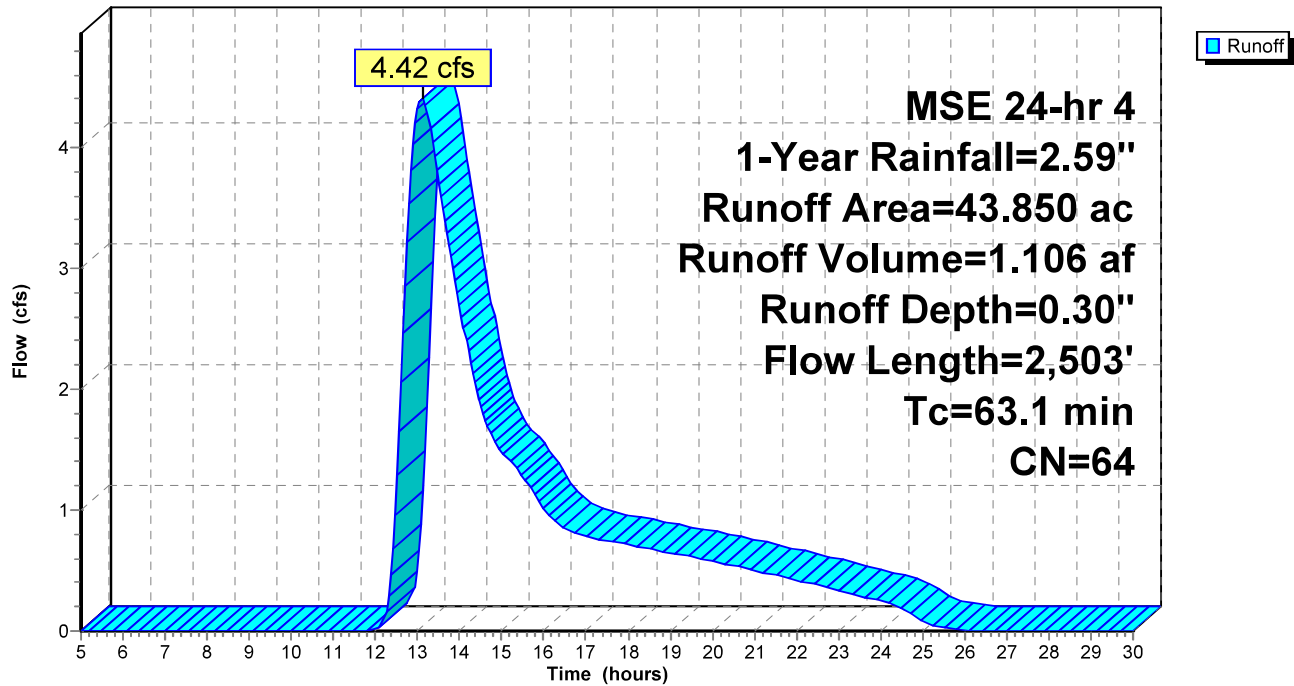
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Subcatchment 1S: 1

Hydrograph



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Summary for Subcatchment 3S: 3

Runoff = 0.27 cfs @ 12.68 hrs, Volume= 0.062 af, Depth= 0.20"

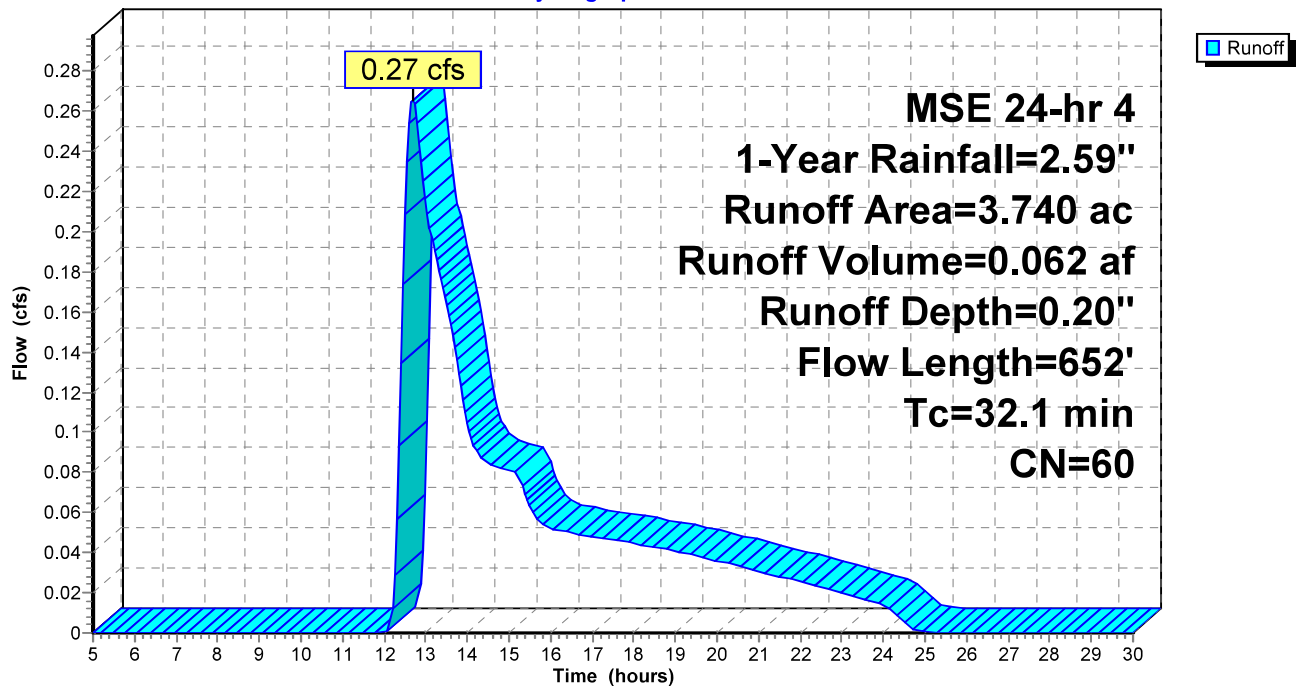
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.59"

Area (ac)	CN	Description
3.740	60	Woods, Fair, HSG B
3.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	161	0.1000	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
0.6	149	0.2200	4.22		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
19.8	139	0.2100	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.0	203	0.2100	1.15		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
32.1	652	Total			

Subcatchment 3S: 3

Hydrograph



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MSE 24-hr 4 1-Year Rainfall=2.59"

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Summary for Subcatchment 4S: 4

Runoff = 2.11 cfs @ 12.19 hrs, Volume= 0.142 af, Depth= 0.62"

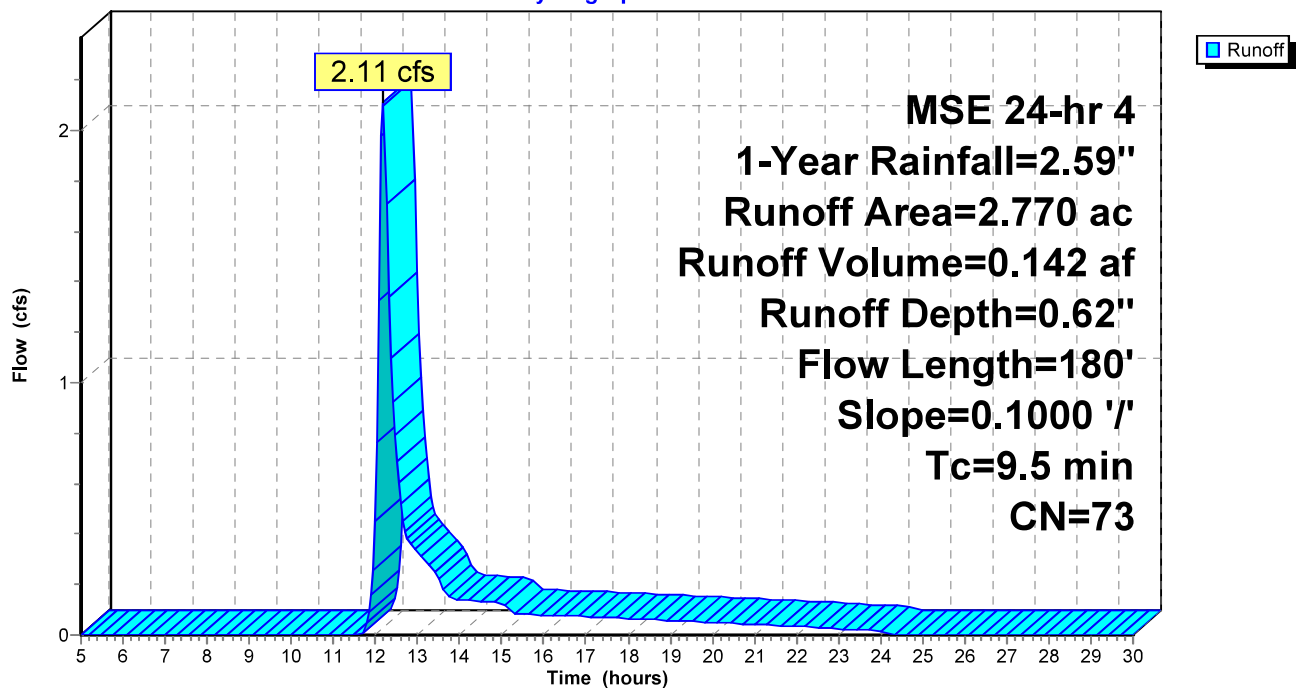
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.59"

Area (ac)	CN	Description
2.770	73	Row crops, C&T + CR, Poor, HSG B
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	180	0.1000	0.32		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"

Subcatchment 4S: 4

Hydrograph



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Summary for Subcatchment 10S: 10

Runoff = 4.86 cfs @ 12.50 hrs, Volume= 0.701 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.59"

Area (ac)	CN	Description
11.700	60	Woods, Fair, HSG B
4.500	73	Row crops, C&T + CR, Poor, HSG B
7.000	72	1/3 acre lots, 30% imp, HSG B
23.200	66	Weighted Average
21.100		90.95% Pervious Area
2.100		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	268	0.0760	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
2.6	193	0.2500	1.25		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.0	285	0.1000	0.79		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
2.4	507	0.1500	3.49		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
2.1	473	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
27.7	1,726	Total			

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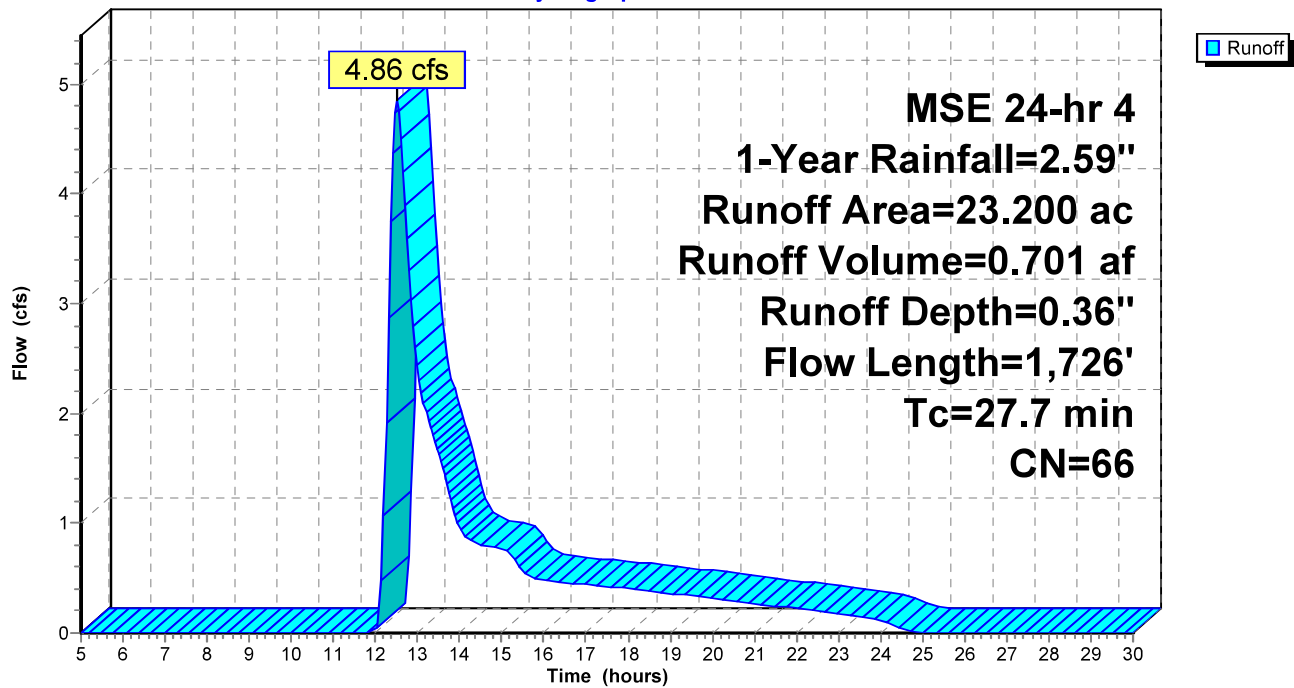
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Subcatchment 10S: 10

Hydrograph



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MSE 24-hr 4 1-Year Rainfall=2.59"

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Summary for Subcatchment 12S: 12

Runoff = 1.17 cfs @ 12.97 hrs, Volume= 0.284 af, Depth= 0.27"

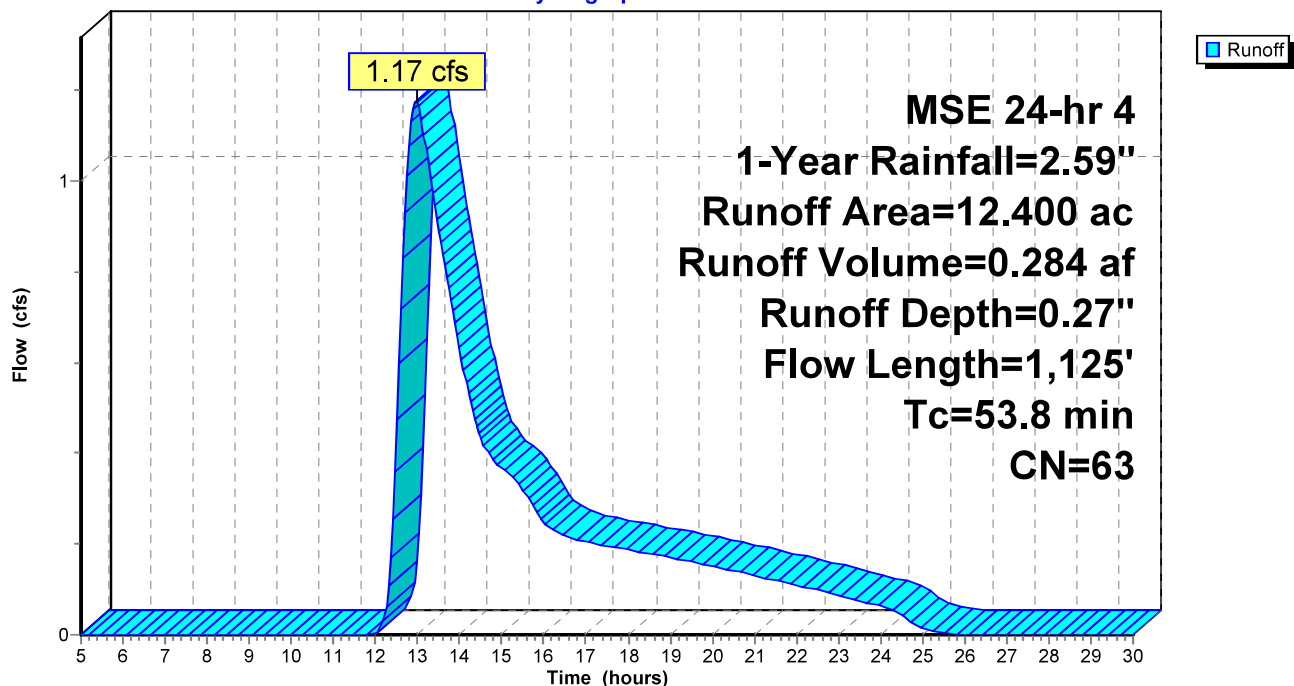
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1-Year Rainfall=2.59"

Area (ac)	CN	Description
8.600	60	Woods, Fair, HSG B
3.400	70	Row crops, C&T + CR, Good, HSG B
0.400	72	1/3 acre lots, 30% imp, HSG B
12.400	63	Weighted Average
12.280		99.03% Pervious Area
0.120		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.9	300	0.1600	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.4	223	0.1900	1.09		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.5	602	0.1800	1.06		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
53.8	1,125	Total			

Subcatchment 12S: 12

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 1-Year Rainfall=2.59"

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Summary for Pond 1P: Pond 1

Inflow Area = 50.360 ac, 0.00% Impervious, Inflow Depth = 0.31" for 1-Year event
Inflow = 4.93 cfs @ 13.09 hrs, Volume= 1.311 af
Outflow = 0.83 cfs @ 17.98 hrs, Volume= 0.995 af, Atten= 83%, Lag= 293.3 min
Primary = 0.83 cfs @ 17.98 hrs, Volume= 0.995 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 719.00' Surf.Area= 24,705 sf Storage= 101,334 cf
Peak Elev= 720.01' @ 17.98 hrs Surf.Area= 35,901 sf Storage= 131,913 cf (30,580 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 317.5 min (1,259.7 - 942.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	714.00'	788,285 cf	Custom Stage Data (Irregular) Listed below		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
714.00	16,075	528.0	0	0	16,075
716.00	19,357	565.0	35,381	35,381	19,474
718.00	22,865	603.0	42,173	77,555	23,194
719.00	24,705	622.0	23,779	101,334	25,145
720.00	35,857	833.0	30,108	131,442	49,586
722.00	43,265	898.0	79,006	210,448	58,706
724.00	51,139	964.0	94,294	304,743	68,661
726.00	59,257	1,022.0	110,296	415,039	78,040
727.00	66,129	1,066.0	62,662	477,700	85,425
728.00	72,328	1,102.0	69,205	546,906	91,730
730.00	82,889	1,163.0	155,097	702,003	102,955
731.00	89,721	1,209.0	86,282	788,285	111,719

Device	Routing	Invert	Outlet Devices
#1	Primary	714.50'	36.0" Round Culvert L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 714.50' / 712.00' S= 0.0128 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Device 1	719.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	722.00'	42.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	727.00'	20.0' long x 55.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.83 cfs @ 17.98 hrs HW=720.01' (Free Discharge)

- 1=Culvert (Passes 0.83 cfs of 53.82 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.83 cfs @ 4.20 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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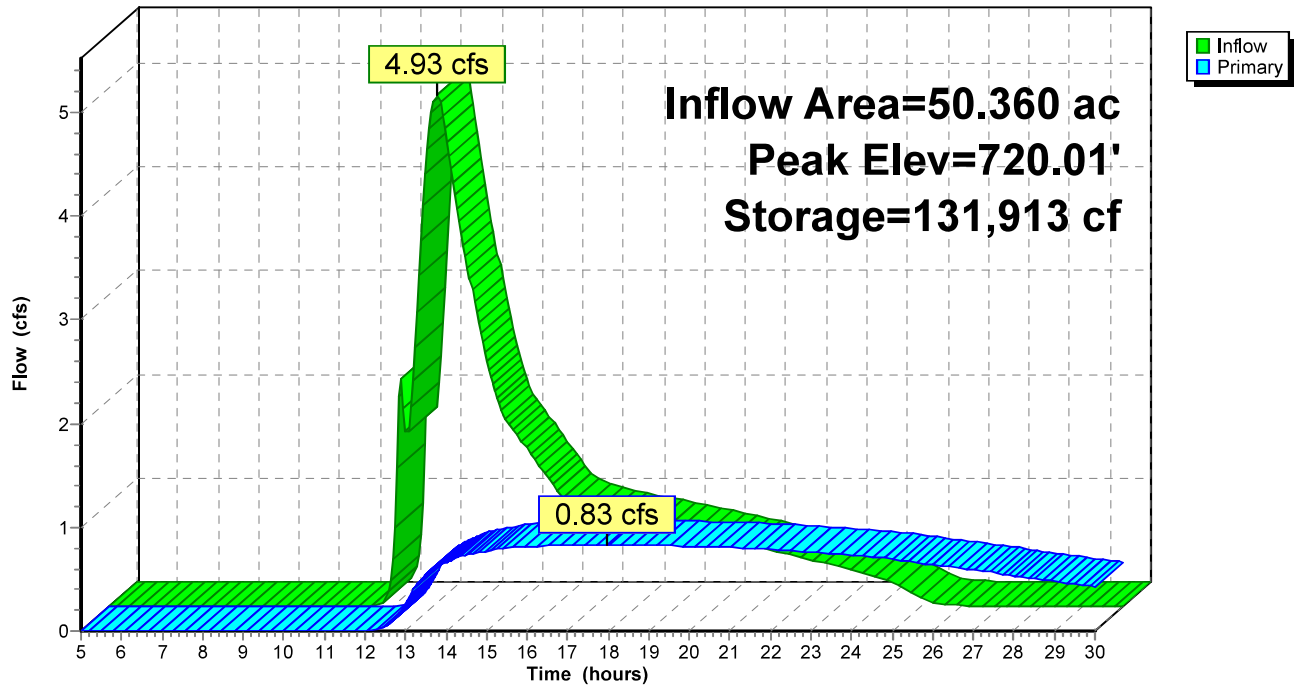
MSE 24-hr 4 1-Year Rainfall=2.59"

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Pond 1P: Pond 1

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 1-Year Rainfall=2.59"

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Summary for Pond 2P: Pond 2

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth > 0.23" for 1-Year event
Inflow = 2.20 cfs @ 13.68 hrs, Volume= 0.689 af
Outflow = 0.60 cfs @ 18.16 hrs, Volume= 0.610 af, Atten= 72%, Lag= 268.9 min
Primary = 0.60 cfs @ 18.16 hrs, Volume= 0.610 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Starting Elev= 709.00' Surf.Area= 13,418 sf Storage= 49,009 cf

Peak Elev= 709.74' @ 18.16 hrs Surf.Area= 17,340 sf Storage= 60,325 cf (11,317 cf above start)

Flood Elev= 922.00' Surf.Area= 54,606 sf Storage= 345,939 cf (296,931 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 227.1 min (1,250.5 - 1,023.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	704.00'	345,939 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
704.00	6,457	412.0	0	0	6,457
705.00	7,724	433.0	7,081	7,081	7,931
707.00	10,458	474.0	18,113	25,194	11,026
709.00	13,418	512.0	23,815	49,009	14,166
710.00	18,854	575.0	16,059	65,068	19,643
711.00	21,204	600.0	20,018	85,085	22,053
712.00	38,323	741.0	29,344	114,430	37,115
713.00	41,472	771.0	39,887	154,317	40,803
714.00	44,608	797.0	43,030	197,347	44,140
715.00	47,845	822.0	46,217	243,564	47,461
716.00	51,168	846.0	49,497	293,062	50,755
717.00	54,606	872.0	52,878	345,939	54,411

Device	Routing	Invert	Outlet Devices
#1	Primary	708.50'	24.0" Round Culvert L= 120.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 708.50' / 707.00' S= 0.0125 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#2	Device 1	709.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	711.00'	42.0" Horiz. Orifice/Grate C= 0.600 in 48.0" Grate (77% open area)
#4	Primary	715.00'	4.0' long x 34.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.66 cfs @ 18.16 hrs HW=709.74' (Free Discharge)

- 1=Culvert (Passes 0.66 cfs of 6.11 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.66 cfs @ 3.36 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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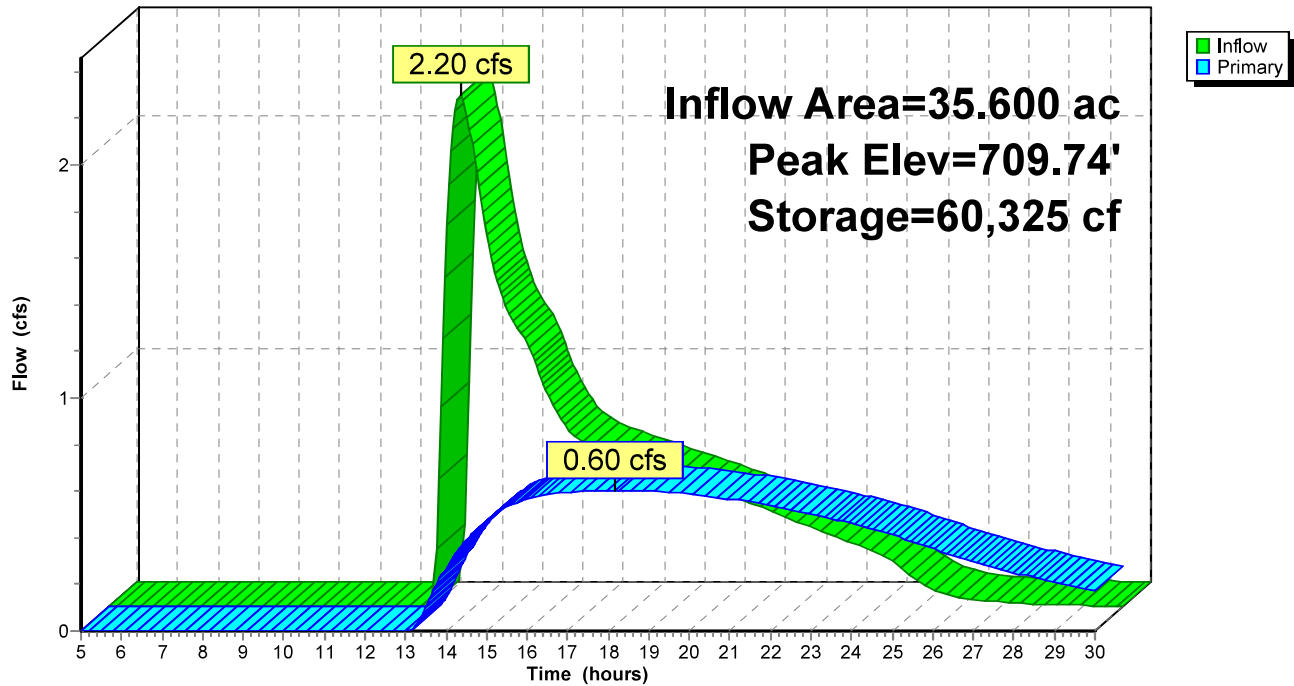
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Pond 2P: Pond 2

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 1-Year Rainfall=2.59"

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Summary for Pond 9P: Forebay

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth = 0.33" for 1-Year event
Inflow = 5.36 cfs @ 12.53 hrs, Volume= 0.985 af
Outflow = 2.20 cfs @ 13.68 hrs, Volume= 0.689 af, Atten= 59%, Lag= 68.6 min
Primary = 2.20 cfs @ 13.68 hrs, Volume= 0.689 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 709.81' @ 13.68 hrs Surf.Area= 10,126 sf Storage= 15,996 cf

Plug-Flow detention time= 211.4 min calculated for 0.689 af (70% of inflow)
Center-of-Mass det. time= 103.3 min (1,023.4 - 920.2)

Volume	Invert	Avail.Storage	Storage Description
#1	708.00'	29,160 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
708.00	7,566	330.0	0	0	7,566
709.00	8,936	355.0	8,242	8,242	8,971
710.00	10,408	381.0	9,663	17,904	10,538
711.00	12,126	411.0	11,256	29,160	12,470

Device	Routing	Invert	Outlet Devices
#1	Primary	709.50'	5.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=2.19 cfs @ 13.68 hrs HW=709.81' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Weir Controls 2.19 cfs @ 1.40 fps)

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Wauzeka Heights Stormwater Ponds

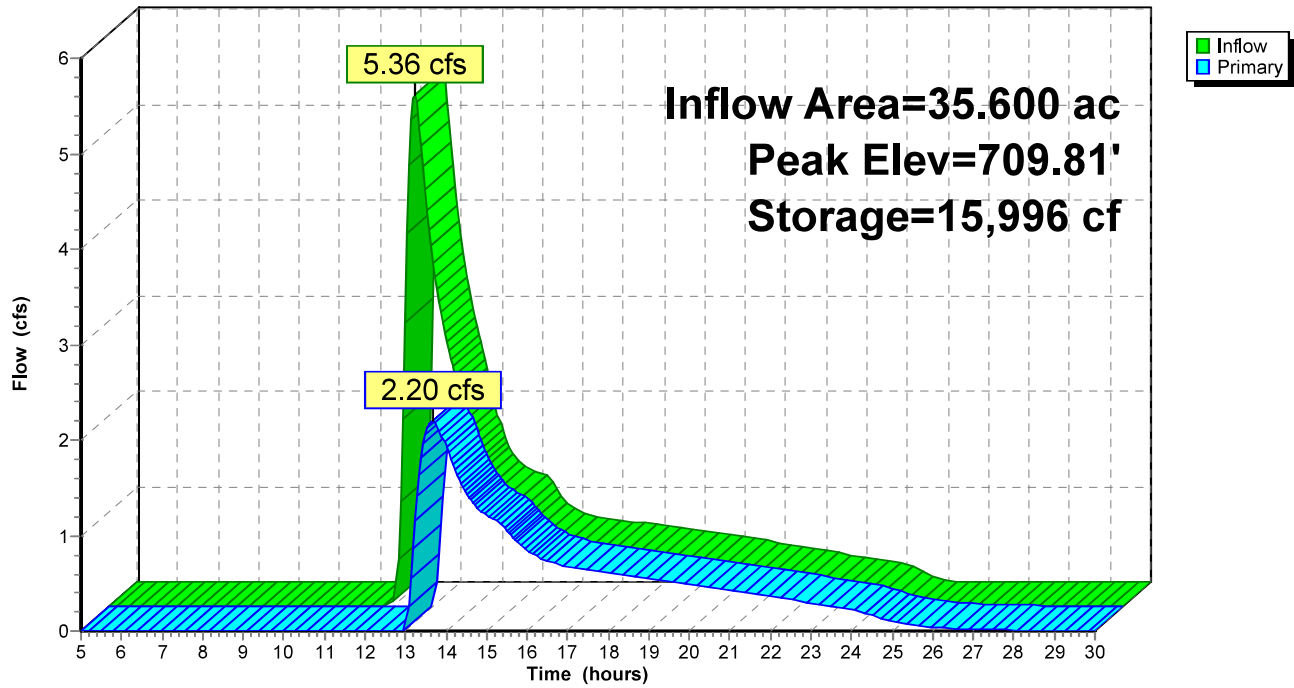
MSE 24-hr 4 1-Year Rainfall=2.59"

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Pond 9P: Forebay

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 1S: 1

Runoff = 7.25 cfs @ 13.05 hrs, Volume= 1.618 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

Area (ac)	CN	Description
31.850	60	Woods, Fair, HSG B
12.000	73	Row crops, C&T + CR, Poor, HSG B
43.850	64	Weighted Average
43.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	296	0.0661	0.30		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
1.2	151	0.1766	2.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	175	0.1475	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	123	0.0885	0.74		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
15.3	701	0.0930	0.76		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.8	352	0.0577	0.60		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.6	393	0.1585	1.00		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.2	312	0.0513	0.57		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
63.1	2,503	Total			

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Wauzeka Heights Stormwater Ponds

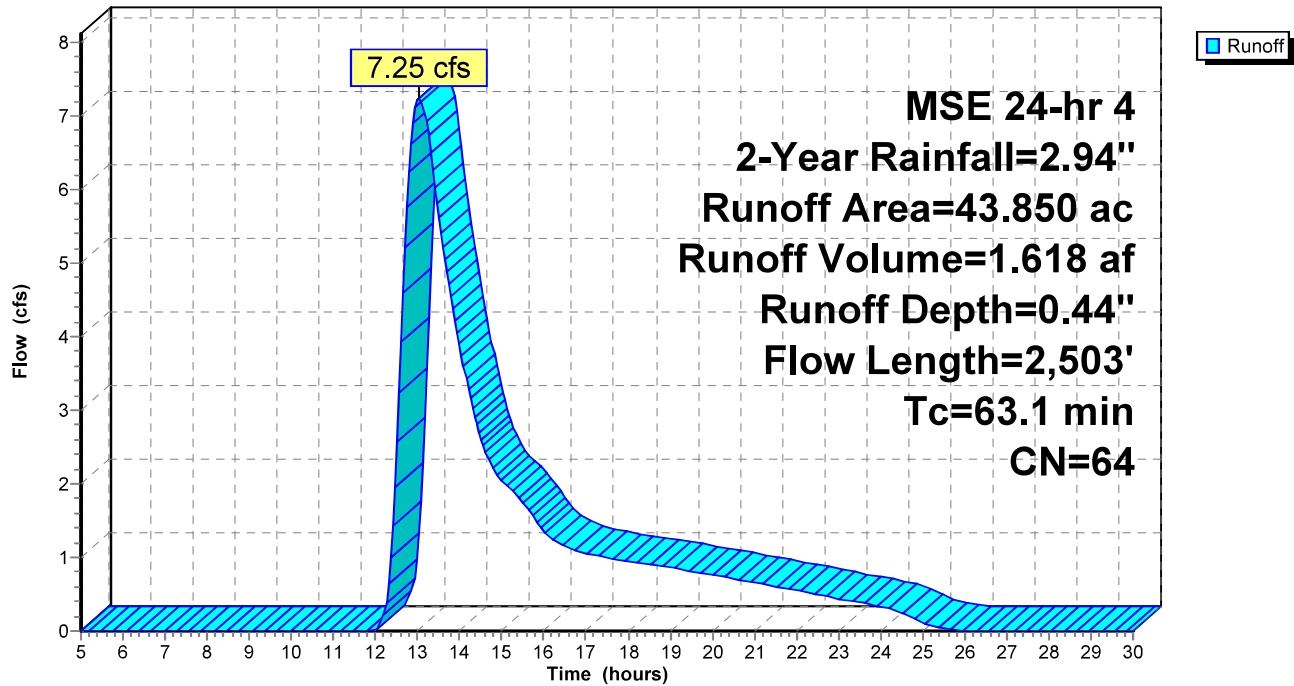
MSE 24-hr 4 2-Year Rainfall=2.94"

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Subcatchment 1S: 1

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 3S: 3

Runoff = 0.53 cfs @ 12.62 hrs, Volume= 0.097 af, Depth= 0.31"

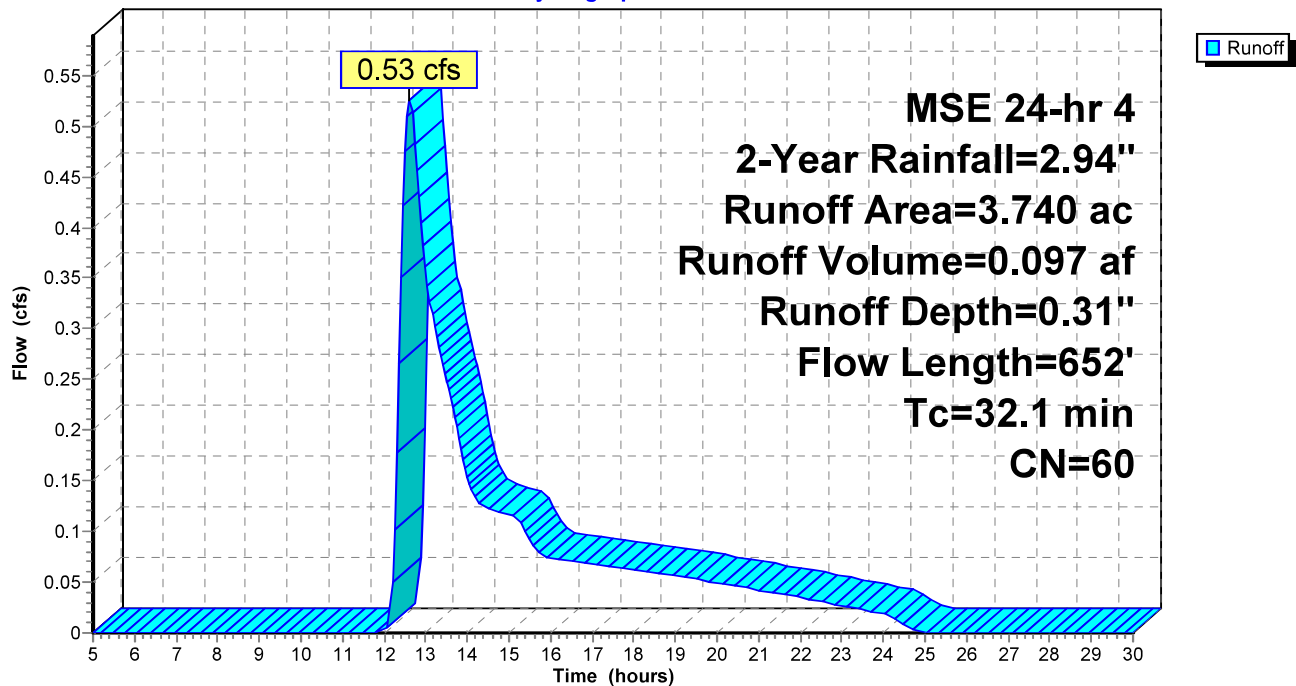
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

Area (ac)	CN	Description
3.740	60	Woods, Fair, HSG B
3.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	161	0.1000	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
0.6	149	0.2200	4.22		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
19.8	139	0.2100	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.0	203	0.2100	1.15		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
32.1	652	Total			

Subcatchment 3S: 3

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 4S: 4

Runoff = 2.92 cfs @ 12.18 hrs, Volume= 0.189 af, Depth= 0.82"

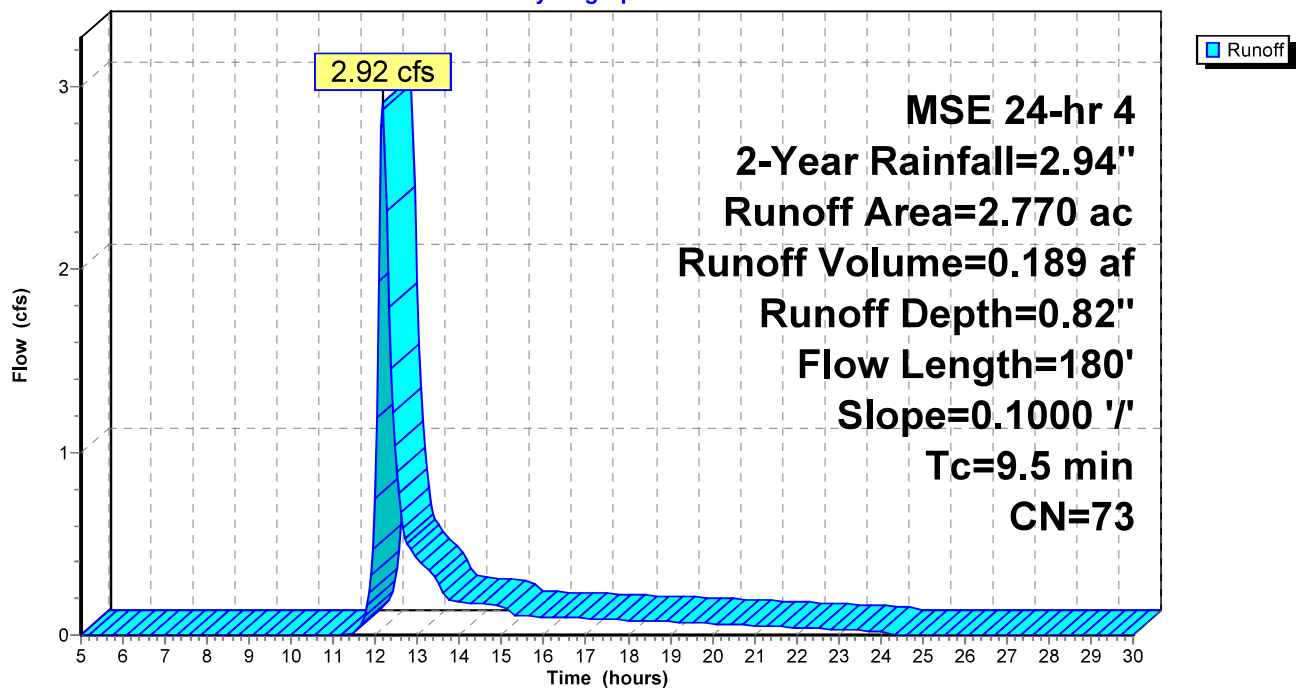
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

Area (ac)	CN	Description
2.770	73	Row crops, C&T + CR, Poor, HSG B
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	180	0.1000	0.32		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"

Subcatchment 4S: 4

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 10S: 10

Runoff = 7.81 cfs @ 12.47 hrs, Volume= 0.999 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

Area (ac)	CN	Description
11.700	60	Woods, Fair, HSG B
4.500	73	Row crops, C&T + CR, Poor, HSG B
7.000	72	1/3 acre lots, 30% imp, HSG B
23.200	66	Weighted Average
21.100		90.95% Pervious Area
2.100		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	268	0.0760	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
2.6	193	0.2500	1.25		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.0	285	0.1000	0.79		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
2.4	507	0.1500	3.49		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
2.1	473	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
27.7	1,726	Total			

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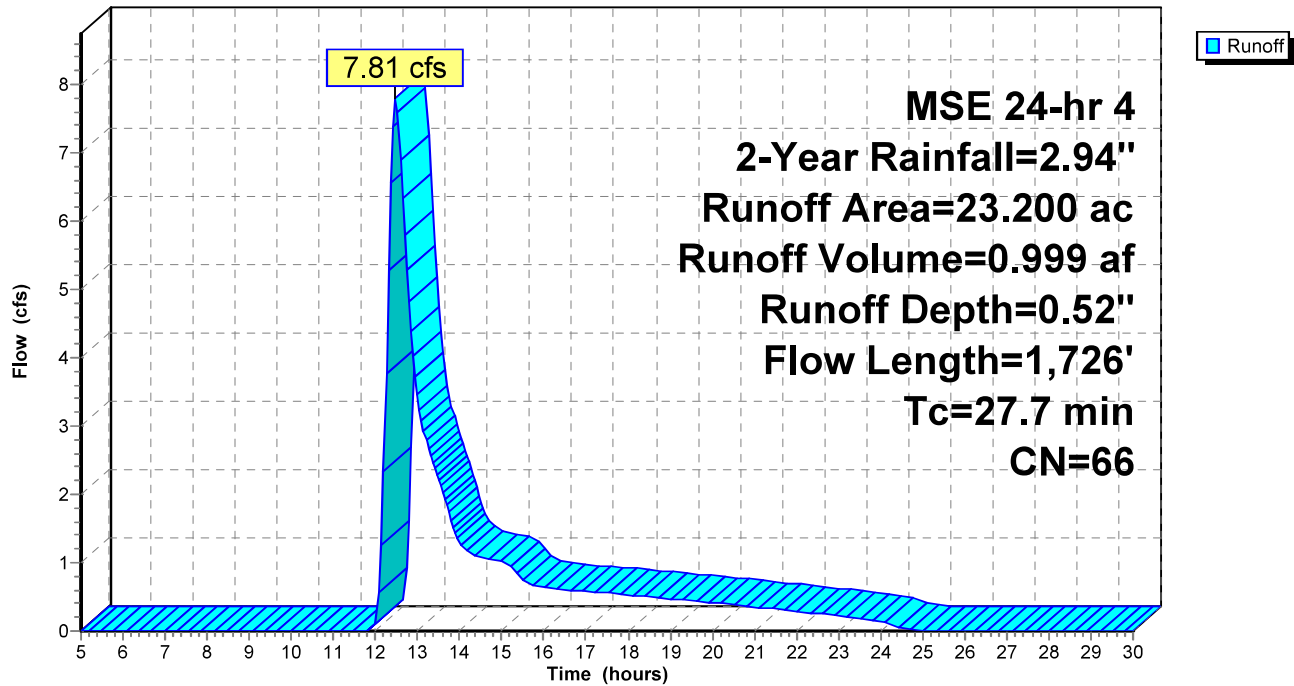
MSE 24-hr 4 2-Year Rainfall=2.94"

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Subcatchment 10S: 10

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 12S: 12

Runoff = 2.00 cfs @ 12.91 hrs, Volume= 0.422 af, Depth= 0.41"

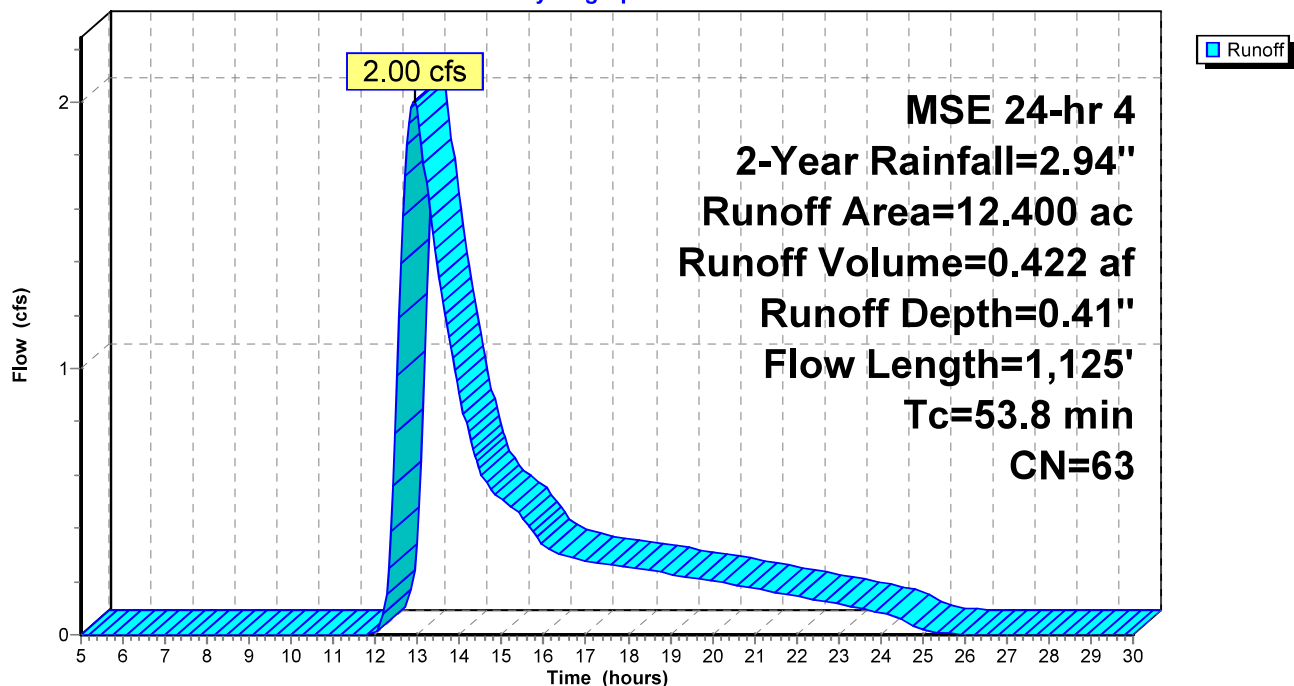
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

Area (ac)	CN	Description
8.600	60	Woods, Fair, HSG B
3.400	70	Row crops, C&T + CR, Good, HSG B
0.400	72	1/3 acre lots, 30% imp, HSG B
12.400	63	Weighted Average
12.280		99.03% Pervious Area
0.120		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.9	300	0.1600	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.4	223	0.1900	1.09		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.5	602	0.1800	1.06		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
53.8	1,125	Total			

Subcatchment 12S: 12

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Pond 1P: Pond 1

Inflow Area = 50.360 ac, 0.00% Impervious, Inflow Depth = 0.45" for 2-Year event
Inflow = 8.01 cfs @ 13.02 hrs, Volume= 1.905 af
Outflow = 1.04 cfs @ 18.55 hrs, Volume= 1.337 af, Atten= 87%, Lag= 331.3 min
Primary = 1.04 cfs @ 18.55 hrs, Volume= 1.337 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Starting Elev= 719.00' Surf.Area= 24,705 sf Storage= 101,334 cf

Peak Elev= 720.46' @ 18.55 hrs Surf.Area= 37,546 sf Storage= 149,452 cf (48,118 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 343.7 min (1,272.0 - 928.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	714.00'	788,285 cf	Custom Stage Data (Irregular) Listed below		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
714.00	16,075	528.0	0	0	16,075
716.00	19,357	565.0	35,381	35,381	19,474
718.00	22,865	603.0	42,173	77,555	23,194
719.00	24,705	622.0	23,779	101,334	25,145
720.00	35,857	833.0	30,108	131,442	49,586
722.00	43,265	898.0	79,006	210,448	58,706
724.00	51,139	964.0	94,294	304,743	68,661
726.00	59,257	1,022.0	110,296	415,039	78,040
727.00	66,129	1,066.0	62,662	477,700	85,425
728.00	72,328	1,102.0	69,205	546,906	91,730
730.00	82,889	1,163.0	155,097	702,003	102,955
731.00	89,721	1,209.0	86,282	788,285	111,719

Device	Routing	Invert	Outlet Devices
#1	Primary	714.50'	36.0" Round Culvert L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 714.50' / 712.00' S= 0.0128 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Device 1	719.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	722.00'	42.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	727.00'	20.0' long x 55.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.04 cfs @ 18.55 hrs HW=720.46' (Free Discharge)

- 1=Culvert (Passes 1.04 cfs of 56.72 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 1.04 cfs @ 5.29 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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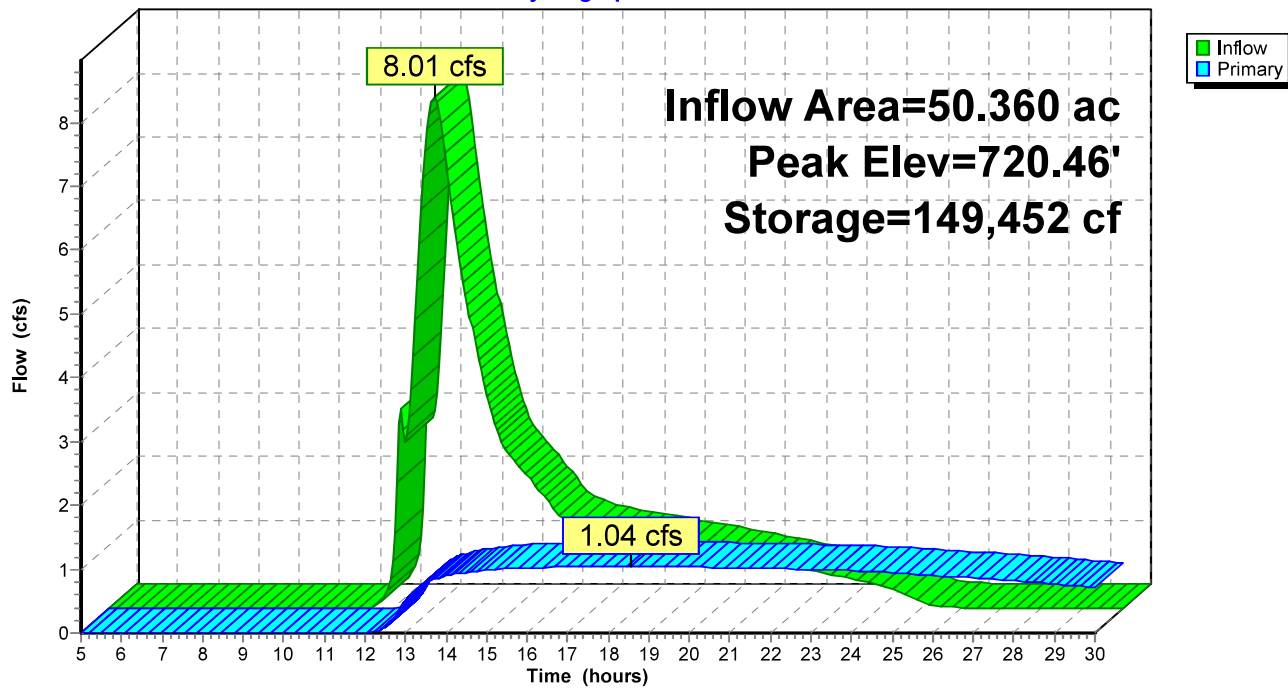
MSE 24-hr 4 2-Year Rainfall=2.94"

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Pond 1P: Pond 1

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Pond 2P: Pond 2

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth > 0.38" for 2-Year event
Inflow = 4.67 cfs @ 13.16 hrs, Volume= 1.124 af
Outflow = 0.94 cfs @ 16.62 hrs, Volume= 1.005 af, Atten= 80%, Lag= 207.5 min
Primary = 0.94 cfs @ 16.62 hrs, Volume= 1.005 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 709.00' Surf.Area= 13,418 sf Storage= 49,009 cf
Peak Elev= 710.26' @ 16.62 hrs Surf.Area= 19,450 sf Storage= 70,035 cf (21,026 cf above start)
Flood Elev= 922.00' Surf.Area= 54,606 sf Storage= 345,939 cf (296,931 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 249.8 min (1,226.3 - 976.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	704.00'	345,939 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
704.00	6,457	412.0	0	0	6,457
705.00	7,724	433.0	7,081	7,081	7,931
707.00	10,458	474.0	18,113	25,194	11,026
709.00	13,418	512.0	23,815	49,009	14,166
710.00	18,854	575.0	16,059	65,068	19,643
711.00	21,204	600.0	20,018	85,085	22,053
712.00	38,323	741.0	29,344	114,430	37,115
713.00	41,472	771.0	39,887	154,317	40,803
714.00	44,608	797.0	43,030	197,347	44,140
715.00	47,845	822.0	46,217	243,564	47,461
716.00	51,168	846.0	49,497	293,062	50,755
717.00	54,606	872.0	52,878	345,939	54,411

Device	Routing	Invert	Outlet Devices
#1	Primary	708.50'	24.0" Round Culvert L= 120.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 708.50' / 707.00' S= 0.0125 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#2	Device 1	709.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	711.00'	42.0" Horiz. Orifice/Grate C= 0.600 in 48.0" Grate (77% open area)
#4	Primary	715.00'	4.0' long x 34.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.95 cfs @ 16.62 hrs HW=710.26' (Free Discharge)

- 1=Culvert (Passes 0.95 cfs of 10.44 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.95 cfs @ 4.84 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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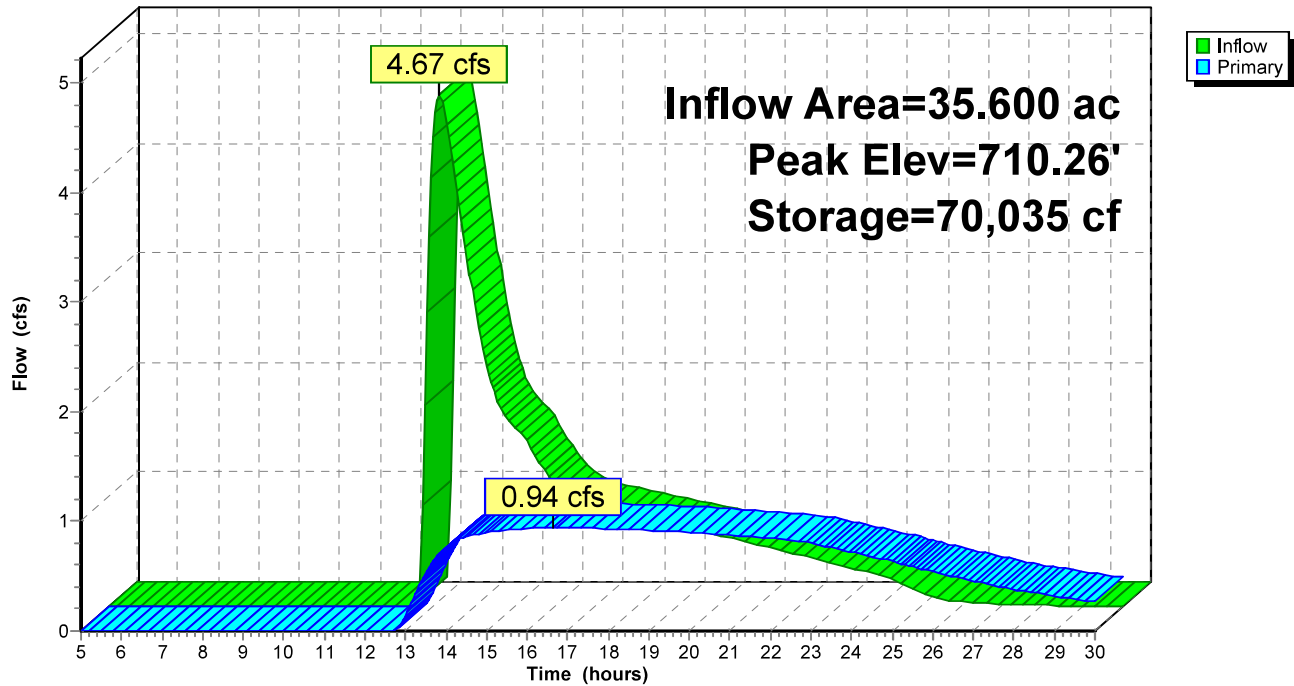
MSE 24-hr 4 2-Year Rainfall=2.94"

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Pond 2P: Pond 2

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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Pond 9P: Forebay

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth = 0.48" for 2-Year event
Inflow = 8.72 cfs @ 12.51 hrs, Volume= 1.420 af
Outflow = 4.67 cfs @ 13.16 hrs, Volume= 1.124 af, Atten= 46%, Lag= 39.1 min
Primary = 4.67 cfs @ 13.16 hrs, Volume= 1.124 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 710.00' @ 13.16 hrs Surf.Area= 10,412 sf Storage= 17,929 cf

Plug-Flow detention time= 151.6 min calculated for 1.122 af (79% of inflow)
Center-of-Mass det. time= 69.8 min (976.4 - 906.7)

Volume	Invert	Avail.Storage	Storage Description
#1	708.00'	29,160 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
708.00	7,566	330.0	0	0	7,566
709.00	8,936	355.0	8,242	8,242	8,971
710.00	10,408	381.0	9,663	17,904	10,538
711.00	12,126	411.0	11,256	29,160	12,470

Device	Routing	Invert	Outlet Devices
#1	Primary	709.50'	5.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.66 cfs @ 13.16 hrs HW=710.00' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Weir Controls 4.66 cfs @ 1.86 fps)

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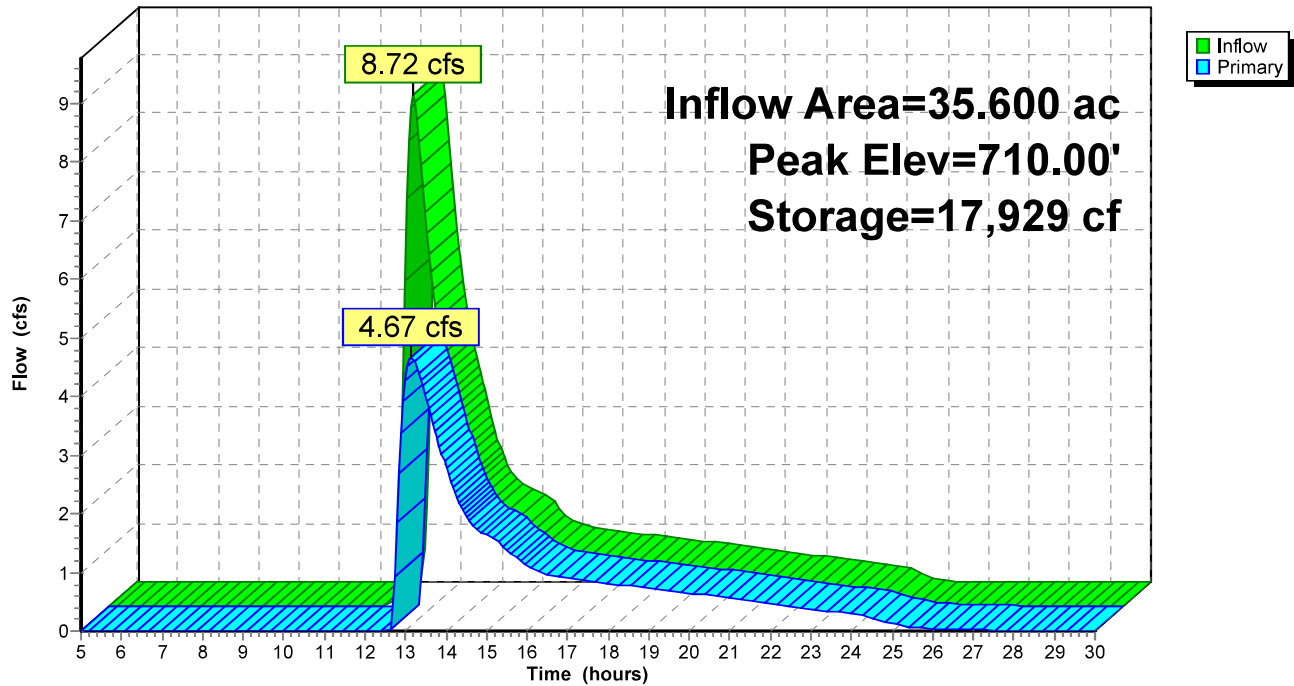
MSE 24-hr 4 2-Year Rainfall=2.94"

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Pond 9P: Forebay

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Subcatchment 1S: 1

Runoff = 77.97 cfs @ 12.87 hrs, Volume= 12.891 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.68"

Area (ac)	CN	Description
31.850	60	Woods, Fair, HSG B
12.000	73	Row crops, C&T + CR, Poor, HSG B
43.850	64	Weighted Average
43.850		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	296	0.0661	0.30		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
1.2	151	0.1766	2.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.5	175	0.1475	1.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.8	123	0.0885	0.74		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
15.3	701	0.0930	0.76		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.8	352	0.0577	0.60		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.6	393	0.1585	1.00		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.2	312	0.0513	0.57		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
63.1	2,503	Total			

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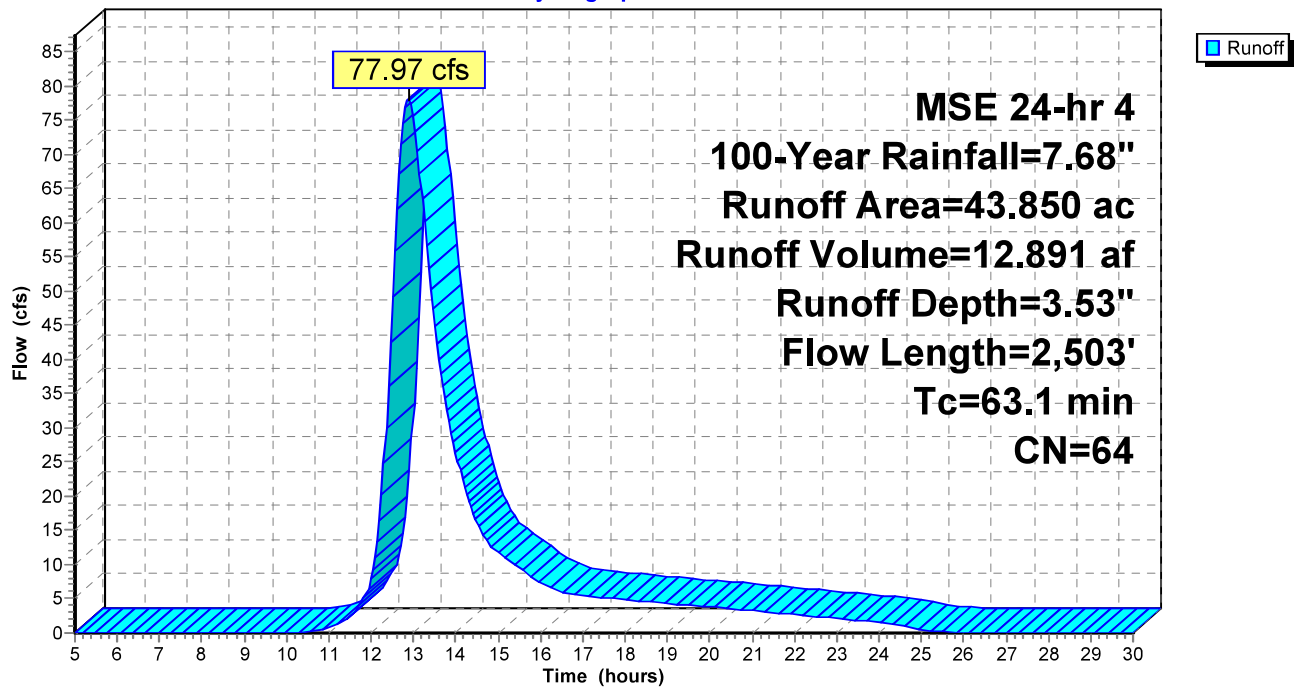
MSE 24-hr 4 100-Year Rainfall=7.68"

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Subcatchment 1S: 1

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Subcatchment 3S: 3

Runoff = 8.77 cfs @ 12.47 hrs, Volume= 0.965 af, Depth= 3.10"

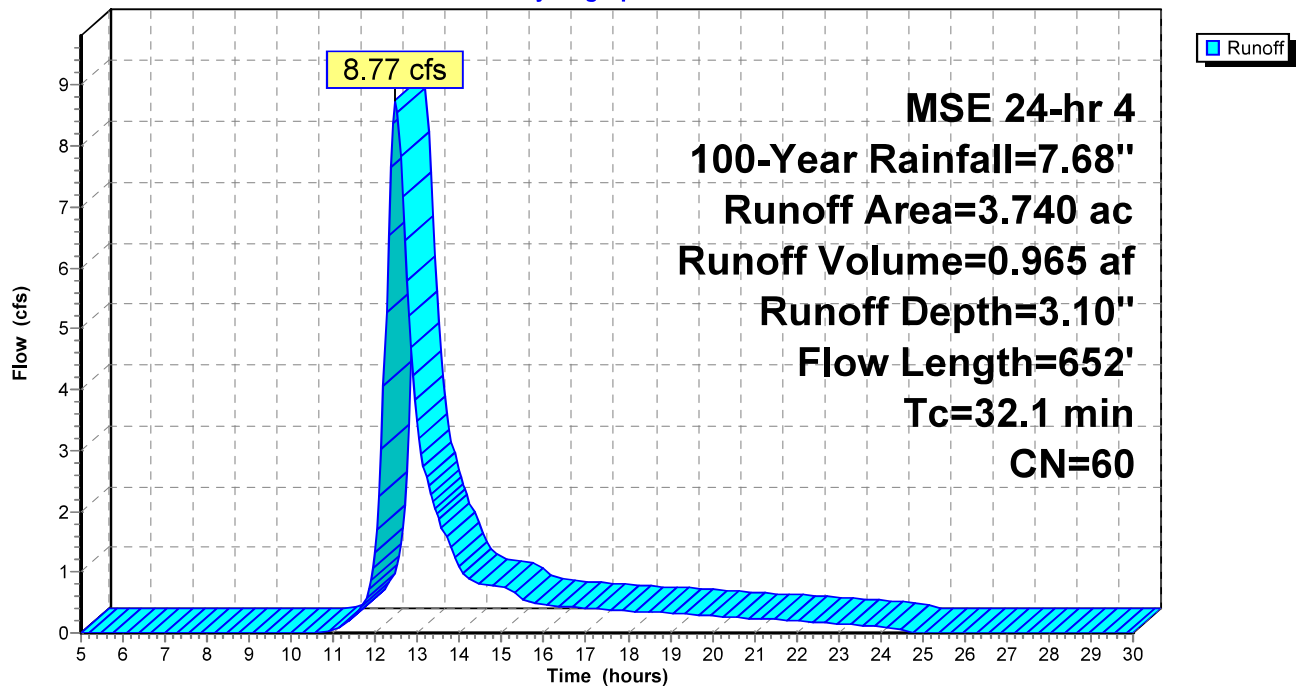
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.68"

Area (ac)	CN	Description
3.740	60	Woods, Fair, HSG B
3.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	161	0.1000	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
0.6	149	0.2200	4.22		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
19.8	139	0.2100	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.0	203	0.2100	1.15		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
32.1	652	Total			

Subcatchment 3S: 3

Hydrograph



Wauzeka Heights WetPond

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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Subcatchment 4S: 4

Runoff = 17.06 cfs @ 12.17 hrs, Volume= 1.045 af, Depth= 4.53"

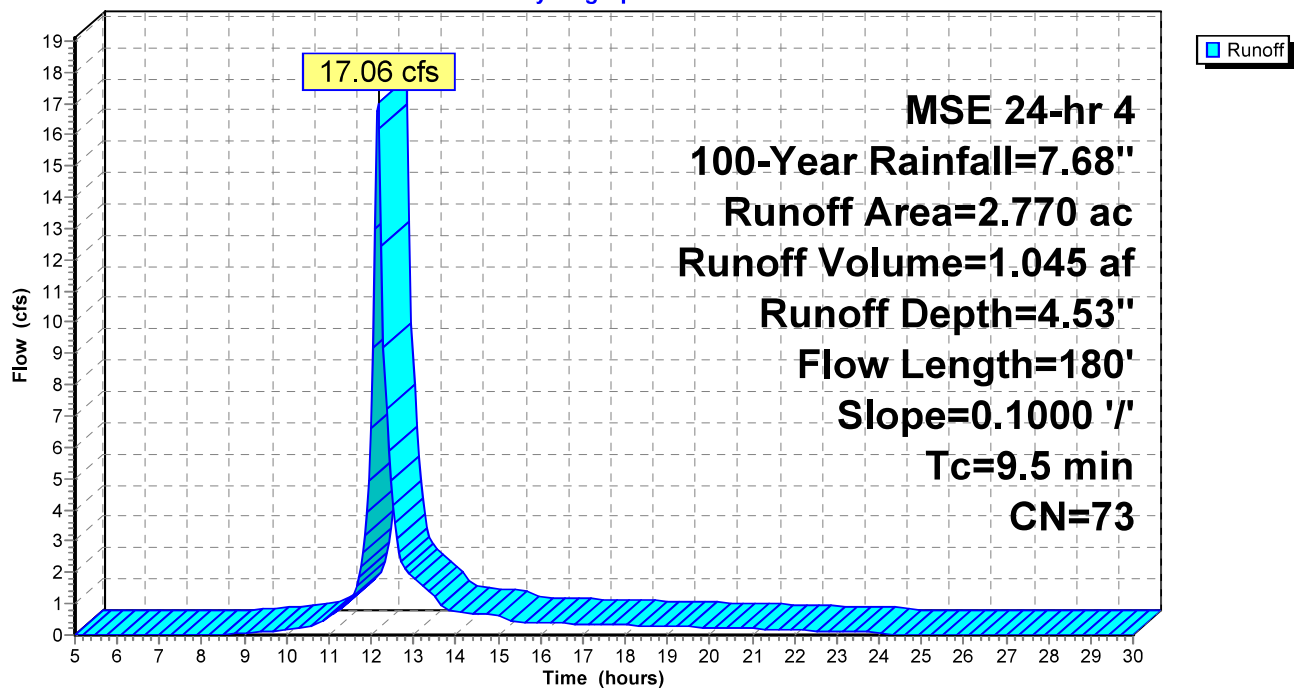
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.68"

Area (ac)	CN	Description
2.770	73	Row crops, C&T + CR, Poor, HSG B
2.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	180	0.1000	0.32		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"

Subcatchment 4S: 4

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Subcatchment 10S: 10

Runoff = 72.64 cfs @ 12.40 hrs, Volume= 7.244 af, Depth= 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.68"

Area (ac)	CN	Description
11.700	60	Woods, Fair, HSG B
4.500	73	Row crops, C&T + CR, Poor, HSG B
7.000	72	1/3 acre lots, 30% imp, HSG B
23.200	66	Weighted Average
21.100		90.95% Pervious Area
2.100		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	268	0.0760	0.31		Sheet Flow, Cultivated: Residue>20% n= 0.170 P2= 2.94"
2.6	193	0.2500	1.25		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
6.0	285	0.1000	0.79		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
2.4	507	0.1500	3.49		Shallow Concentrated Flow, Cultivated Straight Rows Kv= 9.0 fps
2.1	473	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
27.7	1,726	Total			

Wauzeka Heights WetPond

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Wauzeka Heights Stormwater Ponds

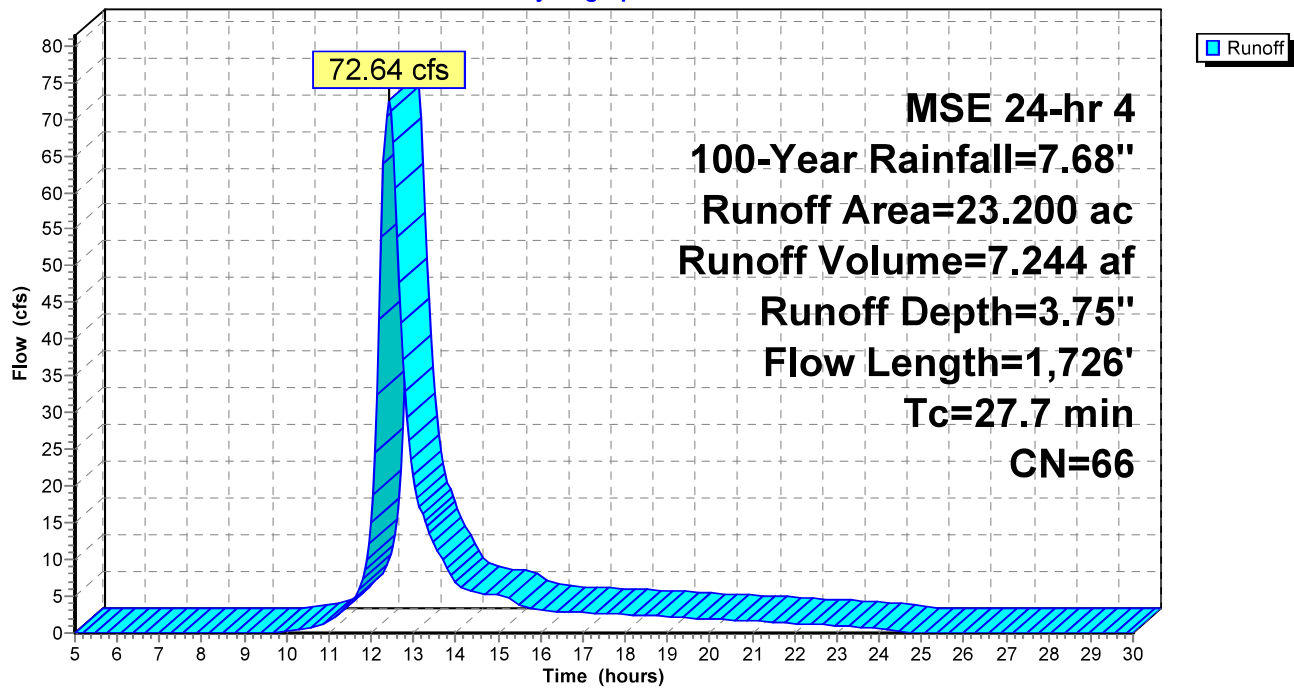
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Subcatchment 10S: 10

Hydrograph



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Wauzeka Heights Stormwater Ponds

MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Subcatchment 12S: 12

Runoff = 23.65 cfs @ 12.75 hrs, Volume= 3.533 af, Depth= 3.42"

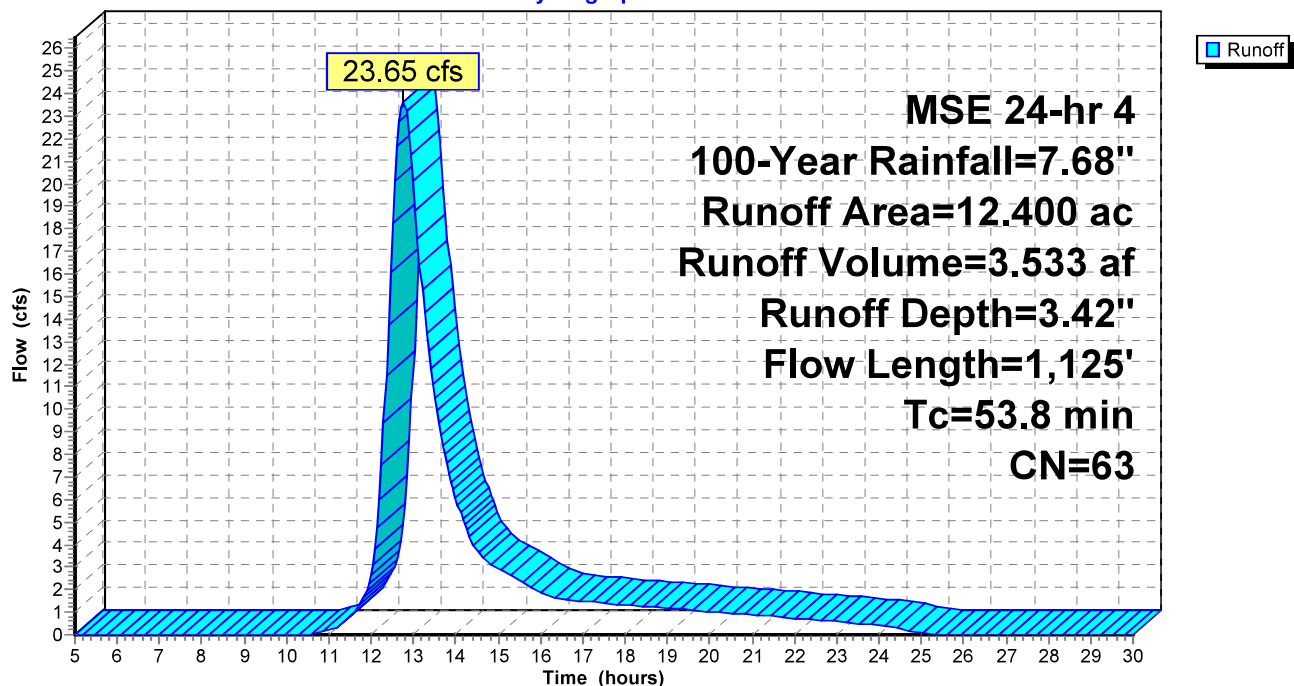
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.68"

Area (ac)	CN	Description
8.600	60	Woods, Fair, HSG B
3.400	70	Row crops, C&T + CR, Good, HSG B
0.400	72	1/3 acre lots, 30% imp, HSG B
12.400	63	Weighted Average
12.280		99.03% Pervious Area
0.120		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.9	300	0.1600	0.12		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.94"
3.4	223	0.1900	1.09		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
9.5	602	0.1800	1.06		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
53.8	1,125	Total			

Subcatchment 12S: 12

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Pond 1P: Pond 1

Inflow Area = 50.360 ac, 0.00% Impervious, Inflow Depth = 3.55" for 100-Year event
Inflow = 84.56 cfs @ 12.85 hrs, Volume= 14.901 af
Outflow = 62.61 cfs @ 13.27 hrs, Volume= 12.995 af, Atten= 26%, Lag= 25.3 min
Primary = 62.61 cfs @ 13.27 hrs, Volume= 12.995 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Starting Elev= 719.00' Surf.Area= 24,705 sf Storage= 101,334 cf

Peak Elev= 723.71' @ 13.27 hrs Surf.Area= 50,007 sf Storage= 291,187 cf (189,853 cf above start)

Plug-Flow detention time= 212.0 min calculated for 10.669 af (72% of inflow)

Center-of-Mass det. time= 85.4 min (956.4 - 871.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	714.00'	788,285 cf	Custom Stage Data (Irregular) Listed below		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
714.00	16,075	528.0	0	0	16,075
716.00	19,357	565.0	35,381	35,381	19,474
718.00	22,865	603.0	42,173	77,555	23,194
719.00	24,705	622.0	23,779	101,334	25,145
720.00	35,857	833.0	30,108	131,442	49,586
722.00	43,265	898.0	79,006	210,448	58,706
724.00	51,139	964.0	94,294	304,743	68,661
726.00	59,257	1,022.0	110,296	415,039	78,040
727.00	66,129	1,066.0	62,662	477,700	85,425
728.00	72,328	1,102.0	69,205	546,906	91,730
730.00	82,889	1,163.0	155,097	702,003	102,955
731.00	89,721	1,209.0	86,282	788,285	111,719

Device	Routing	Invert	Outlet Devices
#1	Primary	714.50'	36.0" Round Culvert L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 714.50' / 712.00' S= 0.0128 ' /' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Device 1	719.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	722.00'	42.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	727.00'	20.0' long x 55.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=62.59 cfs @ 13.27 hrs HW=723.71' (Free Discharge)

- 1=Culvert (Passes 62.59 cfs of 74.61 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 2.00 cfs @ 10.17 fps)
- 3=Orifice/Grate (Orifice Controls 60.59 cfs @ 6.30 fps)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Wauzeka Heights WetPond

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Wauzeka Heights Stormwater Ponds

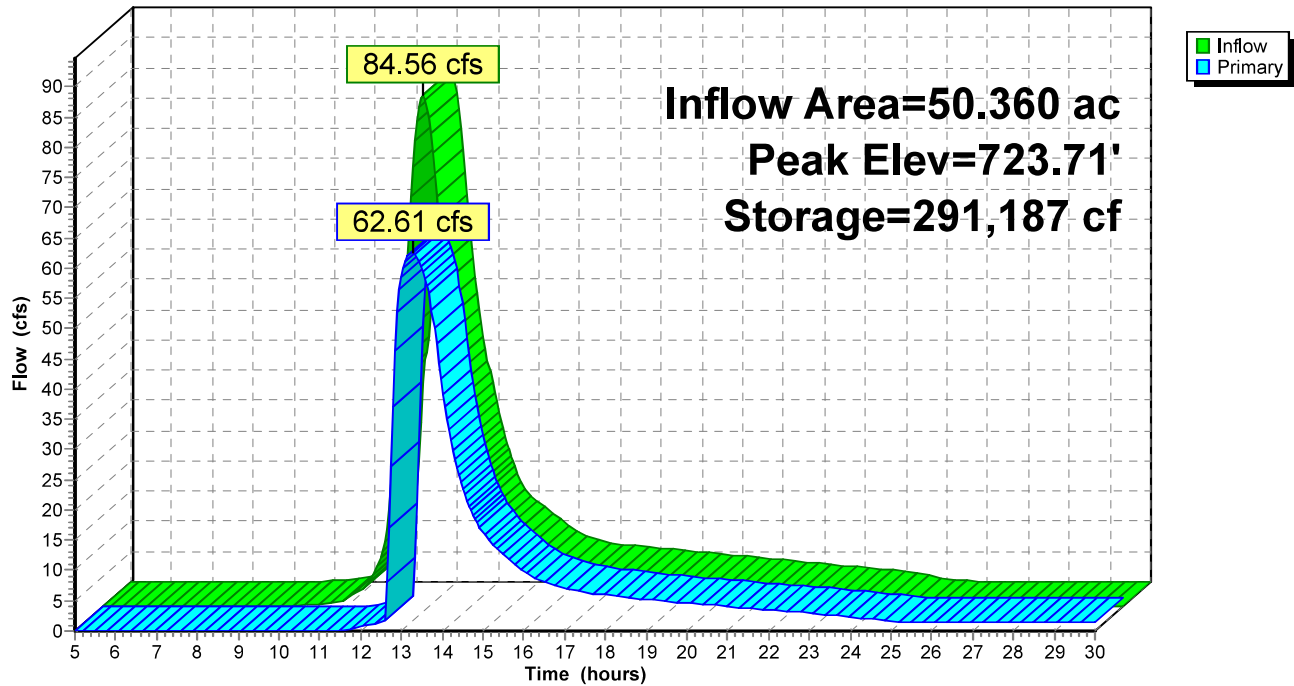
MSE 24-hr 4 100-Year Rainfall=7.68"

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Pond 1P: Pond 1

Hydrograph



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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Pond 2P: Pond 2

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth = 3.53" for 100-Year event
Inflow = 93.40 cfs @ 12.45 hrs, Volume= 10.481 af
Outflow = 25.15 cfs @ 13.40 hrs, Volume= 10.088 af, Atten= 73%, Lag= 57.2 min
Primary = 25.15 cfs @ 13.40 hrs, Volume= 10.088 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs

Starting Elev= 709.00' Surf.Area= 13,418 sf Storage= 49,009 cf

Peak Elev= 714.42' @ 13.40 hrs Surf.Area= 45,962 sf Storage= 216,489 cf (167,481 cf above start)

Flood Elev= 922.00' Surf.Area= 54,606 sf Storage= 345,939 cf (296,931 cf above start)

Plug-Flow detention time= 182.5 min calculated for 8.962 af (86% of inflow)

Center-of-Mass det. time= 94.9 min (960.6 - 865.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	704.00'	345,939 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
704.00	6,457	412.0	0	0	6,457
705.00	7,724	433.0	7,081	7,081	7,931
707.00	10,458	474.0	18,113	25,194	11,026
709.00	13,418	512.0	23,815	49,009	14,166
710.00	18,854	575.0	16,059	65,068	19,643
711.00	21,204	600.0	20,018	85,085	22,053
712.00	38,323	741.0	29,344	114,430	37,115
713.00	41,472	771.0	39,887	154,317	40,803
714.00	44,608	797.0	43,030	197,347	44,140
715.00	47,845	822.0	46,217	243,564	47,461
716.00	51,168	846.0	49,497	293,062	50,755
717.00	54,606	872.0	52,878	345,939	54,411

Device	Routing	Invert	Outlet Devices
#1	Primary	708.50'	24.0" Round Culvert L= 120.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 708.50' / 707.00' S= 0.0125 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 3.14 sf
#2	Device 1	709.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	711.00'	42.0" Horiz. Orifice/Grate C= 0.600 in 48.0" Grate (77% open area)
#4	Primary	715.00'	4.0' long x 34.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.17 cfs @ 13.40 hrs HW=714.42' (Free Discharge)

- 1=Culvert (Barrel Controls 25.17 cfs @ 8.01 fps)
- 2=Orifice/Grate (Passes < 2.15 cfs potential flow)
- 3=Orifice/Grate (Passes < 85.70 cfs potential flow)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Wauzeka Heights WetPond

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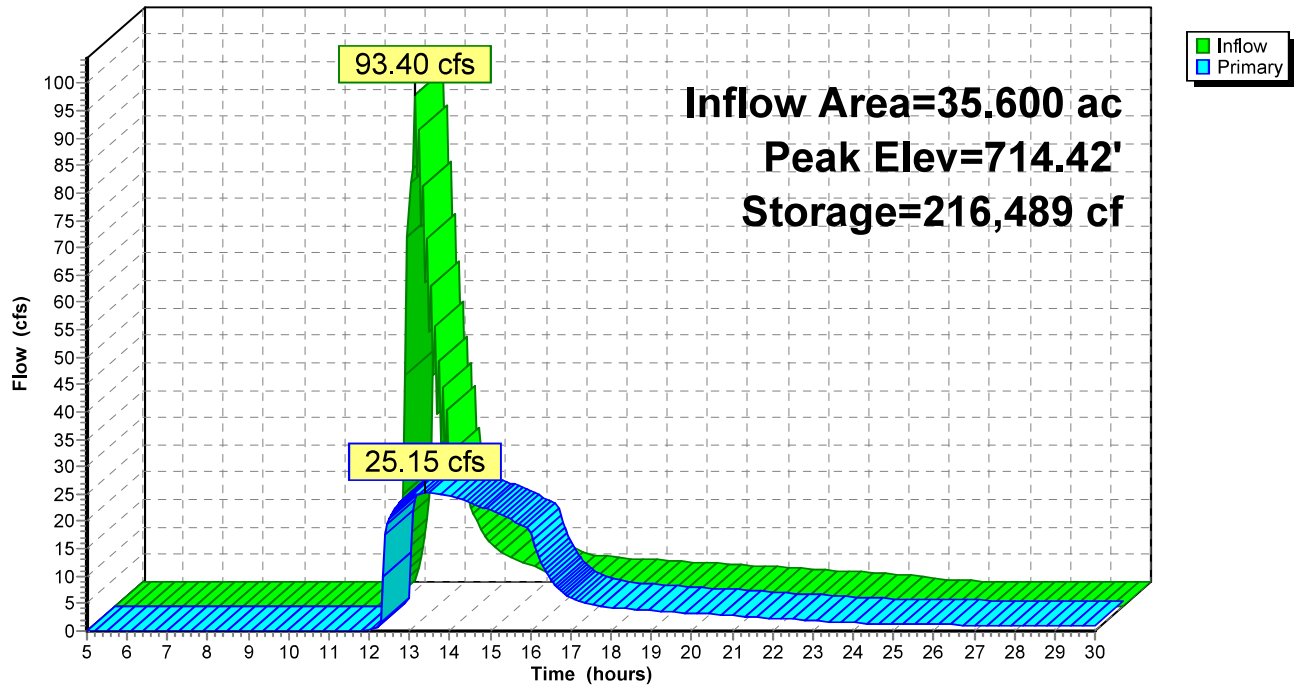
Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Pond 2P: Pond 2

Hydrograph



Wauzeka Heights WetPond

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Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Summary for Pond 9P: Forebay

Inflow Area = 35.600 ac, 6.24% Impervious, Inflow Depth = 3.63" for 100-Year event
Inflow = 87.21 cfs @ 12.44 hrs, Volume= 10.777 af
Outflow = 93.40 cfs @ 12.45 hrs, Volume= 10.481 af, Atten= 0%, Lag= 0.6 min
Primary = 93.40 cfs @ 12.45 hrs, Volume= 10.481 af

Routing by Stor-Ind method, Time Span= 5.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 713.17' @ 12.45 hrs Surf.Area= 12,126 sf Storage= 29,160 cf

Plug-Flow detention time= 30.1 min calculated for 10.460 af (97% of inflow)
Center-of-Mass det. time= 15.4 min (865.7 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	708.00'	29,160 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
708.00	7,566	330.0	0	0	7,566
709.00	8,936	355.0	8,242	8,242	8,971
710.00	10,408	381.0	9,663	17,904	10,538
711.00	12,126	411.0	11,256	29,160	12,470

Device	Routing	Invert	Outlet Devices
#1	Primary	709.50'	5.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=93.07 cfs @ 12.45 hrs HW=713.16' (Free Discharge)

↑1=Broad-Crested Rectangular Weir (Weir Controls 93.07 cfs @ 5.09 fps)

Wauzeka Heights WetPond

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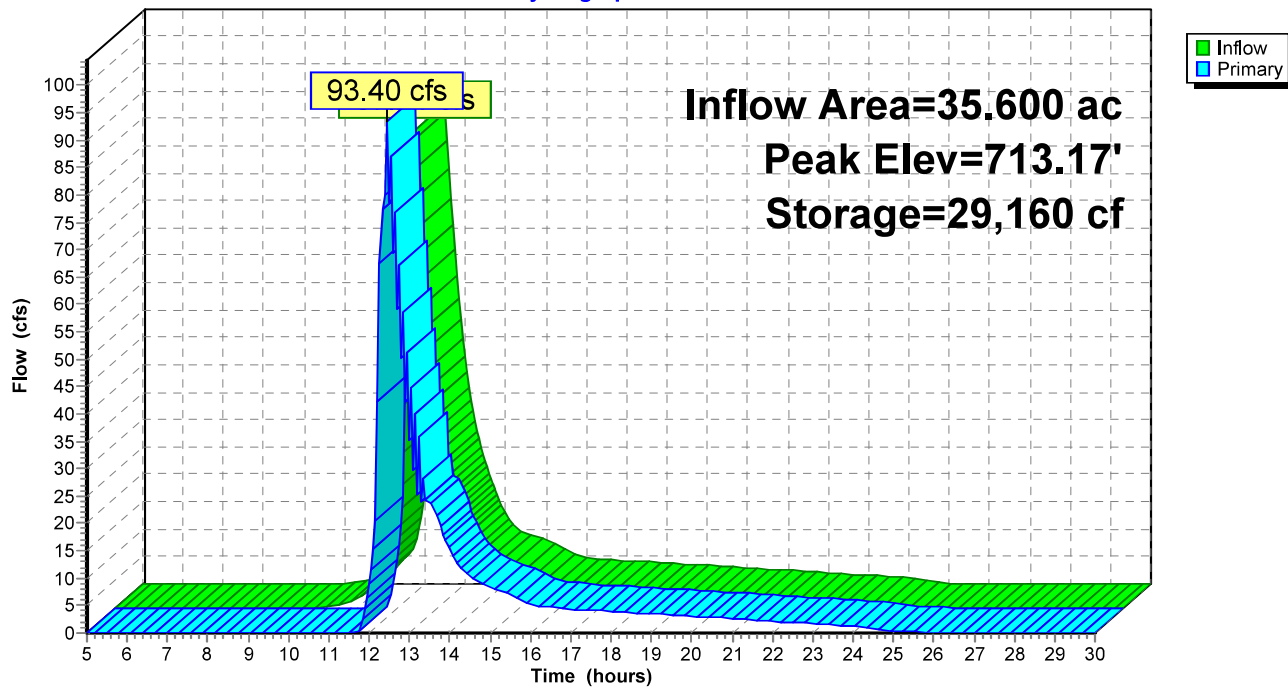
Wauzeka Heights Stormwater Ponds
MSE 24-hr 4 100-Year Rainfall=7.68"

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Pond 9P: Forebay

Hydrograph



Attachment #1 1



710 Commerce Drive
PO Box 169
Watertown, WI 53094

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

Delta3 Engineering-Platteville Total Phosphorous Analysis 6/13/19

Field ID	Sample #	Total P (ppm)
Wauzeka-Kickapoo	1	608.8
Wauzeka-Kickapoo	3	308.6
Wauzeka-Kickapoo	5	519.5
Wauzeka-Kickapoo	7	494.1
Wauzeka-Kickapoo	9	661.9
Wauzeka-Kickapoo	11	576.8
Wauzeka-Kickapoo	13	687.7
Wauzeka-Kickapoo	15	578.9
Wauzeka-Kickapoo	17	616.2
Wauzeka-Kickapoo	19	483.0
Wauzeka-Kickapoo	21	567.2
Wauzeka-Kickapoo	23	562.1
Wauzeka-Kickapoo	25	356.4
Wauzeka-Kickapoo	27	588.7
Wauzeka-Kickapoo	29	335.2



710 Commerce Drive
PO Box 169
Watertown, WI 53094

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www.rockriverlab.com

6/1/2020

Agricultural Fields-
TP Testing

Acct: 579
Village of Wauzeka

Total Phosphorus

Field ID	Sample ID	P (ppm)
D15-096	1	731.0
D15-096	2	888.5
D15-096	3	478.3
D15-096	4	672.5
D15-096	5	397.2
D15-096	6	761.4
D15-096	7	434.0
D15-096	8	482.7
D15-096	9	513.5
D15-096	10	428.1
D15-096	11	345.5
D15-096	12	471.7
D15-096	13	438.6
D15-096	14	457.9
D15-096	15	225.3
D15-096	16	671.5
D15-096	17	428.4
D15-096	18	483.4
D15-096	19	436.6
D15-096	20	564.0
D15-096	21	475.2
D15-096	22	623.1
D15-096	23	501.0
D15-096	24	514.9
D15-096	25	564.3
D15-096	26	516.8
D15-096	27	531.2
D15-096	28	710.2
D15-096	29	616.4
D15-096	30	564.1
D15-096	31	266.0
D15-096	32	505.1
D15-096	33	442.7
D15-096	34	381.4
D15-096	35	323.0
D15-096	36	407.3
D15-096	37	370.7
D15-096	38	385.9
D15-096	39	340.1
D15-096	40	595.5
D15-096	41	546.1

D15-096	42	371.4
D15-096	43	389.1
D15-096	44	457.0
D15-096	45	523.8
D15-096	46	247.7
D15-096	47	507.5
D15-096	48	545.1
D15-096	49	586.1
D15-096	50	397.4

Agricultural Field-
TP Testing

Attachment #12

I. Introduction

The lateral recession rate of the eroding bank is a critical component for the NRCS Streambank Erosion Estimator. The following documentation provides the justification for the lateral recession rates used in the NRCS Streambank Erosion Estimator. Lateral recession rate was estimated based on the photos provided, description, and on site evaluation. The following includes representative photos of Project Sites to be stabilized through installation of Best Management Practices (BMPs). Photos were taken on 7-28-2020 and 11-17-2020. Tall overhanging grass and vegetation limits view of the exposed/eroding bank. Most of the exposed banks were also submerged due to the high water as demonstrated by the USGS data for the Kickapoo River gage station at La Farge. Normal stream flow is 150 cfs while recent flowrates have been closer to 300 cfs.



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Daily discharge, cubic feet per second -- statistics for Nov 20
based on 81 water years of record [more](#)

Min (1970)	25th percen- tile	Median	Mean	75th percen- tile	Most Recent Instantaneous Value Nov 20	Max (2019)
70.0	121	150	156	180	260	322

Please find photos that best demonstrate the recession rates evaluated from onsite inspection. These descriptions would indicate “severe” recession rates according to the NRCS Guidance and would have a lateral recession rate of 0.3-0.5 ft/yr. In the WQT Plan, we used recession rates of 0.3 ft/yr in the severe areas (Reach A and Reach C) and 0.2 ft/yr in moderate areas (Reach B).

II. Reach A



Image 1 – Severe vegetative overhang and extremely steep banks. As demonstrated by the dock walkway, the river is much higher than average which conceals most of the exposed banks and erosion



Image 2 – Severe vegetative overhang and slump with fallen tree



Image 3 – Severe vegetative overhang

III. Reach B



Image 4 – Vegetative overhang



Image 5 – No trees are on the banks along the Village park to serve as indicators, but this image clearly demonstrates a bank slump

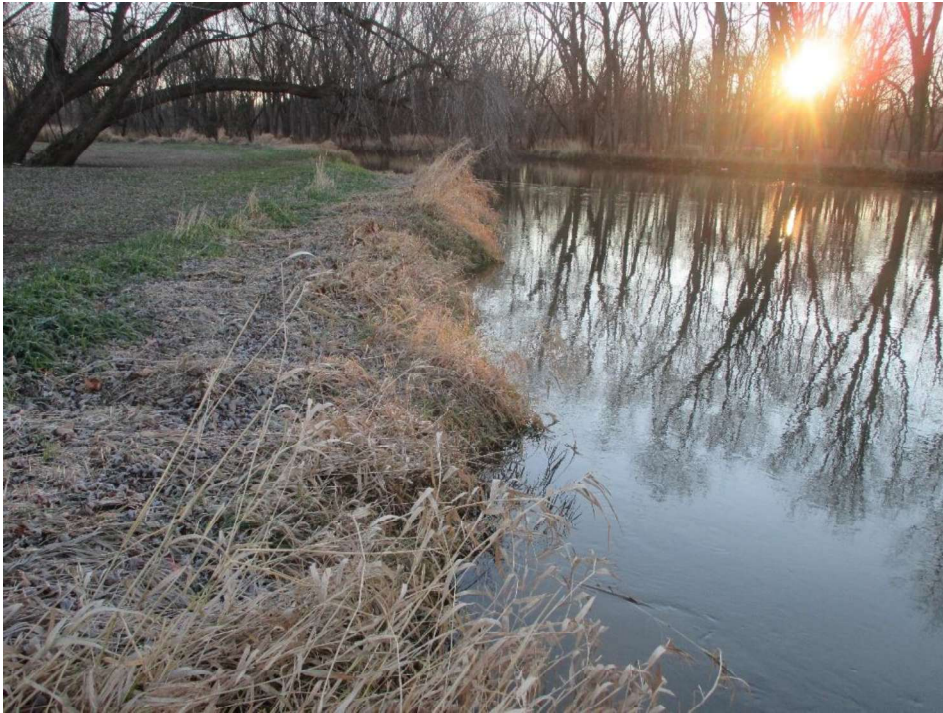


Image 6 – Vegetative overhang



Image 6 – Bank slump

Reach C



Image 6 – Vegetative overhang and predominately bare banks



Image 7 – Several trees fallen into the river due to bank erosion and other trees on the verge of tipping in

Attachment #13

Water Quality Trading Operation and Maintenance Plan

Introduction:

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

Publicly Owned BMPs:

A Village representative is to complete inspection form annually and following major storm events. The form will then be provided to the Wastewater Operator following inspection. The Village will address maintenance issues identified during inspection within 30 days. Substantial maintenance issues may require an extended timeframe for generation of plans, specifications, permitting, and a public bid process to perform the work. Inspections and O&M activities shall be reported in the annual WQT Report sent to the DNR. **Currently, all portions of the BMPs are planned to occur on Publicly owned property.** Village will be required to perform maintenance activities at the expense of the Village. Inspections and O&M activities shall be reported in the annual WQT Report sent to the DNR.

Easement:

Not applicable.

Quality Assurance:

All storm pipes and storm sewer structures are to be installed per industry standards and shall meet all local, state, and federal codes. Riprap gradation and composition shall be provided for each source of material. Riprap shall be installed per *Wisconsin Department of Transportation Specification 606 Riprap*.

Construction:

The project shall be bid publicly. Bids will be reviewed by the Village Board. Contractor selection will be based upon bid pricing, contractor experience, references, and other applicable criteria. A resident inspector will provide on site inspection during construction to ensure the BMPs are constructed per plan.

Practice Registration:

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

Tracking Procedures:

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

Inspections/Maintenance Considerations:

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

Routine Maintenance Items that can be performed by Village:

- Evaluate BMP condition
 - Reconstruct/replace riprap and structures that have been damaged.
 - Look for areas that have settled, shifted, or washed out.
 - Evaluate and remove sediment deposition
 - Look for obstructions and unauthorized modifications that reduce BMP effectiveness
 - Evaluate outfall quality and any unusual odors
- Manage Vegetation
 - Remove invasive/noxious plants.
- Manage Garbage
 - Remove garbage and other debris that could otherwise impair the BMP.

Monthly Certification:

Each month, the Village will certify that the riprap and pond berms are maintained and operating in a manner consistent with this Water Quality Trading Plan or provide a statement noting noncompliance with this Plan. The monthly Discharge Monitoring Report (DMR) will include the following statement

as a certification of compliance when the Credit Generating Practice is operating in a manner consistent with the Plan:

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

Annual Inspection:

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

Noncompliance:

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

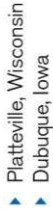
The Village will submit a written notification within five days after the Village recognizes that the phosphorus credits are not being generated as outlined in the Trading Plan. DNR may waive the requirement for submittal for a written notice within five days and instruct the Village to submit the written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

The written notification should include:

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

Notification of Trade Agreement Termination:

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



P 608.348.5355

P 563.542.9005

E mail@delta3eng.biz
W www.delta3eng.biz

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

[illegible]

Photos Taken? ☐ Yes ☐ No

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STORM WATER POND BMP INSPECTION FORM

BMP ID#:	
BMP Type:	
Inspector/Title:	
Date & Time:	
Weather:	
Inspection Type (circle one):	Routine / Precipitation Event / Other:

* inspection photos should be taken annually at minimum

	Issue	Response	Comments
1	Standing water present?	Yes ☐ No ☐ N/A ☐	
2	Pipe(s) and/or structure(s) are free of obstruction and in functional condition	Yes ☐ No ☐ N/A ☐	
3	Any unauthorized modifications that reduce BMP effectiveness	Yes ☐ No ☐ N/A ☐	
4	Berms and Outfall are vegetated and free of erosion, tree roots, and animal borroughs	Yes ☐ No ☐ N/A ☐	
5	Sediment accumulation present	Yes ☐ No ☐ N/A ☐	
6	Evidence of trash, oil, gas, or other contaminants present	Yes ☐ No ☐ N/A ☐	
7	Invasive/nuisance vegetation or weeds present	Yes ☐ No ☐ N/A ☐	
8	Mosquitos or mosquito larvae present	Yes ☐ No ☐ N/A ☐	
9	Unpleasant odors	Yes ☐ No ☐ N/A ☐	
10	Rip-rap is not displaced and functioning properly	Yes ☐ No ☐ N/A ☐	
11	Water at outfall(s) appears in good quality (if applicable)	Yes ☐ No ☐ N/A ☐	

Additional Comments

Comments

Photos Taken? ☐ Yes ☐ No

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**Water Quality Trading Management
Practice Registration**
Form 3400-207 (R 1/14)

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

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

Broker/Exchange Information (if applicable)		
Was a broker/exchange be used to facilitate trade? ☐ Yes ☐ No		
Broker/Exchange Organization Name	Contact Name	
Address	Phone Number	Email

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

The preparer certifies all of the following:

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

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

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

Leave Blank – For Department Use Only		
Date Received	Trade Docket Number	
Entered in Tracking System ☐ Yes	Date Entered	Name of Department Reviewer

Notification of Water Trade Agreement Termination

Form 3400-209 (1/14)

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

Applicant Information

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

Credit Generator Information

Credit generator type (select all that apply):

☐ Permitted Discharge (non-MS4/CAFO)	☐ Urban nonpoint source discharge
☐ Permitted MS4	☐ Agricultural nonpoint source discharge
☐ Permitted CAFO	☐ Other - Specify:

Trade Agreement number(s) to be terminated including affected land parcel ID(s):

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

Is this agreement being updated or replaced?	☐ Yes ☐ No ☐ Unsure
Will this termination result in non-compliance with the effective limit or other permit requirements?	☐ Yes; Name: _____ ☐ No ☐ Unsure

The preparer certifies all of the following:

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

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

Authorized Representative Signature

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

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

Attachment #14

January 21, 2022

Ms. Julia A. Stephenson
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
La Crosse, WI 54601

Re: Annual Water Quality Trading Report #1
Village of Wauzeka, WI

Dear Julia:

As requested and required by Schedule 4.2 Annual Water Quality Trading (WQT) Report of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0, below, please find the Annual WQT Report for the Village of Wauzeka's Wastewater Treatment Facility. Please review for approval.

I. WQT Credit Use

Table 1 provides a summary of Total Phosphorus (TP) Credits used each month in 2021.

Table 1 – 2021 Monthly Credits Used

Month	Credits Used
Jan. ('21)	-
Feb. ('21)	-
Mar. ('21)	-
Apr. ('21)	-
May ('21)	-
Jun. ('21)	-
Jul. ('21)	-
Aug. ('21)	-
Sept. ('21)	-
Oct. ('21)	4.30
Nov. ('21)	3.30
Dec. ('21)	13.95
Total:	21.55

II. Source of Credits

The Village of Wauzeka's WQT Plan (WQT-2021-0002) was approved on 1-29-2021. The WQT Plan approved 236.1 lbs./yr. of TP Credits which were included in the latest WPDES Permit. Construction of the WQT Project was completed in Fall 2021 and credits were registered on 10-26-2021. The Village is currently using TP Credits to comply with the WWTF's Effluent TP Limit.

III. Annual Inspection

Construction was completed in Fall of 2021 and credits were registered accordingly. The owner, property owner, and contractor performed a Project walk through prior to final payment and concluded that the Project was installed per the Plans and Specifications and satisfied the WQT Plan. Annual inspections will continue to be performed in the Spring of each year to ensure the trading practices remain in place and satisfy the WQT Plan. The Village of Wauzeka has operated and will continue to operate in accordance with the terms and conditions of its WPDES Permit and WQT Plan.

If you have any questions, please feel free to contact me at (608) 348-5355. Thank you.

Sincerely,

DELTA 3 Engineering, Inc.

A handwritten signature in black ink that reads "Jordan Fure". The signature is fluid and cursive, with the first and last names clearly legible.

Jordan Fure, E.I.T.
Project Engineer

JDF: jf

Cc: Nick Zeeh – WWTF Operator
Phyllis Groom – Village Clerk

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January 31, 2023

Ms. Julia A. Stephenson
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
La Crosse, WI 54601

Re: Annual Water Quality Trading Report #2
Village of Wauzeka, WI

Dear Julia:

As requested and required by Schedule 4.2 Annual Water Quality Trading (WQT) Report of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0, below, please find the Annual WQT Report for the Village of Wauzeka's Wastewater Treatment Facility. Please review for approval.

I. WQT Credit Use

Table 1 provides a summary of Total Phosphorus (TP) Credits used each month in 2022.
Table 2 provides a summary of annual TP Credits Used since 2021.

Table 1 – 2022 Monthly Credits Used

Month	Credits Used
Jan. ('22)	5.31
Feb. ('22)	3.29
Mar. ('22)	1.52
Apr. ('22)	4.44
May ('22)	2.72
Jun. ('22)	2.72
Jul. ('22)	2.79
Aug. ('22)	2.26
Sept. ('22)	2.32
Oct. ('22)	3.10
Nov. ('22)	2.30
Dec. ('22)	6.90
Total:	39.67

Table 2 – Summary of Annual TP Credits Used

Year	Credits Used
2021	21.55
2022	39.67

II. Source of Credits

The Village of Wauzeka's WQT Plan (WQT-2021-0002) was approved on 1-29-2021. The WQT Plan approved 236.1 lbs./yr. of TP Credits which were included in the latest WPDES Permit. Construction of the WQT Project was completed in Fall 2021 and credits were registered on 10-26-2021. The Village is currently using TP Credits to comply with the WWTF's Effluent TP Limit.

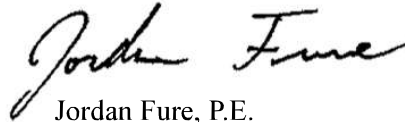
III. Annual Inspection

Annual inspection was completed in April 2022 with no major deficiencies identified. Vegetation has been well established since completion of construction. Monthly inspections also identified no deficiencies. Annual inspection will continue to be performed in the Spring of each year to ensure the trading practices remain in place and satisfy the WQT Plan. The Village of Wauzeka has operated and will continue to operate in accordance with the terms and conditions of its WPDES Permit and WQT Plan.

If you have any questions, please feel free to contact me at (608) 348-5355. Thank you.

Sincerely,

DELTA 3 Engineering, Inc.



Jordan Fure, P.E.

Project Engineer

JDF: jf

Cc: Nick Zeeh – WWTF Operator
Phyllis Groom – Village Clerk

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April 8, 2024

Ms. Katie Jo Jerzak
Wisconsin Department of Natural Resources
1300 W. Clairemont Avenue
Eau Claire, WI 54701

Re: Annual Water Quality Trading Report #3 – revised
Village of Wauzeka, WI

Dear Katie Jo:

As requested and required by Schedule 4.2 Annual Water Quality Trading (WQT) Report of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0, below, please find the Annual WQT Report for the Village of Wauzeka's Wastewater Treatment Facility. Please review for approval.

I. WQT Credit Use

Table 1 provides a summary of Total Phosphorus (TP) Credits used each month in 2023.

Credits were calculated using the formulas in Section 2.2.2.2 of the Village's WPDES Permit.

Table 1 – 2023 Monthly Credits Used

Month	Credits Used
Jan. ('23)	4.42
Feb. ('23)	2.09
Mar. ('23)	2.09
Apr. ('23)	6.56
May ('23)	6.37
Jun. ('23)	3.86
Jul. ('23)	3.54
Aug. ('23)	5.46
Sept. ('23)	7.34
Oct. ('23)	4.10
Nov. ('23)	1.45
Dec. ('23)	6.45
Total:	53.73

II. Source of Credits

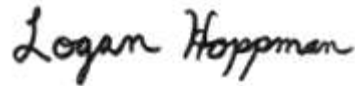
The Village of Wauzeka's WQT Plan (WQT-2021-0002) was approved on 1-29-2021. The WQT Plan approved **236.1 lbs./yr.** of TP Credits which were included in the latest WPDES Permit. Construction of the WQT Project was completed in Fall 2021 and credits were registered on 10-26-2021. The Village is currently using TP Credits to comply with the WWTF's Effluent TP Limit.

III. Annual Inspection

Annual inspection was completed in April 2023 with no major deficiencies identified. Vegetation has been well established since completion of construction. Monthly inspections also identified no deficiencies. **Please see Appendix A for the monthly Streambank Inspection Forms for 2023. Photos were not taken during 2023 inspections. Photos will be provided going forward starting with the 2024 inspections.** Annual inspection will continue to be performed in the Spring of each year to ensure the trading practices remain in place and satisfy the WQT Plan. The Village of Wauzeka has operated and will continue to operate in accordance with the terms and conditions of its WPDES Permit and WQT Plan.

If you have any questions, please feel free to contact me at (608) 348-5355. Thank you.

Sincerely,
DELTA 3 Engineering, Inc.



Logan Hoppman, E.I.T.
Civil/Environmental Engineer

LMH:lh

Cc: Jordan Fure – Delta 3 Engineering, Inc.
Nick Zeel – WWTF Operator
Phyllis Groom – Village Clerk

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BMP Inspection Form

Date: 1/27/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	1/27/23	-
Pond #2	Good	-	-	1/27/23	-
Streambank	Good	-	-	1/27/23	-

BMP Inspection Form

Date: 2/24/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	2/24/23	-
Pond #2	Good	-	-	2/24/23	-
Streambank	Good	-	-	2/24/23	-

BMP Inspection Form

Date: 3/24/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	3/24/23	-
Pond #2	Good	-	-	3/24/23	-
Streambank	Good	-	-	3/24/23	-

BMP Inspection Form

Date: 4/28/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	4/28/23	-
Pond #2	Good	-	-	4/28/23	-
Streambank	Good	-	-	4/28/23	-

BMP Inspection Form

Date: 5/26/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	5/26/23	-
Pond #2	Good	-	-	5/26/23	-
Streambank	Good	-	-	5/26/23	-

BMP Inspection Form

Date: 6/23/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	6/23/23	-
Pond #2	Good	-	-	6/23/23	-
Streambank	Good	-	-	6/23/23	-

BMP Inspection Form

Date: 7/28/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	7/28/23	-
Pond #2	Good	-	-	7/28/23	-
Streambank	Good	-	-	7/28/23	-

BMP Inspection Form

Date: 8/25/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	8/25/23	-
Pond #2	Good	-	-	8/25/23	-
Streambank	Good	-	-	8/25/23	-

BMP Inspection Form

Date: 9/22/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	9/22/23	-
Pond #2	Good	-	-	9/22/23	-
Streambank	Good	-	-	9/22/23	-

BMP Inspection Form

Date: 10/27/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	10/27/23	-
Pond #2	Good	-	-	10/27/23	-
Streambank	Good	-	-	10/27/23	-

BMP Inspection Form

Date: 11/22/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	11/22/23	-
Pond #2	Good	-	-	11/22/23	-
Streambank	Good	-	-	11/22/23	-

BMP Inspection Form

Date: 12/22/23

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	12/22/23	-
Pond #2	Good	-	-	12/22/23	-
Streambank	Good	-	-	12/22/23	-

January 31, 2025

Ms. Katie Jo Jerzak
Wisconsin Department of Natural Resources
1300 W. Clairemont Avenue
Eau Claire, WI 54701

Re: Annual Water Quality Trading Report #4 – Revised
Village of Wauzeka, WI

Dear Katie Jo:

As requested and required by Schedule 4.2 Annual Water Quality Trading (WQT) Report of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0, below, please find the Annual WQT Report for the Village of Wauzeka's Wastewater Treatment Facility. Please review for approval.

I. WQT Credit Use

Table 1 provides a summary of Total Phosphorus (TP) Credits used each month in 2024. Credits were calculated using the formulas in Section 2.2.2.2 of the Village's WPDES Permit. Table 2 Provides a summary of annual TP Credits Used since 2021.

Table 1 – 2024 Monthly Credits Used

Month	Credits Used
Jan. ('24)	1.64
Feb. ('24)	2.43
Mar. ('24)	1.42
Apr. ('24)	2.43
May ('24)	4.30
Jun. ('24)	4.92
Jul. ('24)	5.77
Aug. ('24)	4.14
Sept. ('24)	3.64
Oct. ('24)	2.77
Nov. ('24)	4.12
Dec. ('24)	2.17
Total:	39.75

Table 2 – Summary of Annual TP Credits Used

Year	Credits Used
2021	21.55
2022	39.67
2023	53.73
2024	39.75

II. Source of Credits

The Village of Wauzeka's WQT Plan (WQT-2021-0002) was approved on 1-29-2021. TP Credits were generated from a streambank stabilization project as described in the Village's WQT Plan. The WQT Plan approved **236.1 lbs./yr.** of TP Credits which were included in the latest WPDES Permit. Construction of the WQT Project was completed in Fall 2021 and

credits were registered on 10-26-2021. The Village is currently using TP Credits to comply with the WWTF's Effluent TP Limit.

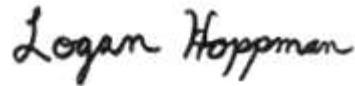
III. Annual Inspection

Annual inspection was completed in July 2024 with a few deficiencies identified. Vegetation has been well established since completion of construction with the exception of a few washouts due to heavy rainfall and resulting runoff. Monthly inspections also identified several washouts and silted streambanks. Washouts were filled and silted streambanks were excavated and reshaped by November 2024. Please see Appendix A for the Streambank Inspection Forms for 2024. Photos are provided in Appendix B. Annual inspection will continue to be performed in the Spring of each year to ensure the trading practices remain in place and satisfy the WQT Plan. The Village of Wauzeka has operated and will continue to operate in accordance with the terms and conditions of its WPDES Permit and WQT Plan.

If you have any questions, please feel free to contact me at (608) 348-5355. Thank you.

Sincerely,

DELTA 3 Engineering, Inc.



Logan Hoppman, P.E.
Civil/Environmental Engineer

LMH:lh

Cc: Jordan Fure – Delta 3 Engineering, Inc.
Bart Nies – Delta 3 Engineering, Inc.
Nick Zeeh – WWTF Operator
Phyllis Groom – Village Clerk-Treasurer

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Appendix A
Streambank Inspection Forms

Village of Wauzeka
BMP Inspection Form

YEAR: 2024

DATE:	NEEDS MAINTENANCE (Y / N):				INSP BY:	MAINTENANCE REQUIRED:	DATE COMPLETED:
	WEST POND:	EAST POND:	RIVER BANK:				
11-Mar	N	N	N		NZ	Minor points of Erosion at both ponds, continue to monitor. No concerns with river bank	
16-Apr	Y	N	Y		NZ / BM/ DNR Reps	WP - Washouts observed, EP - Continue to monitor erosion RB - West side of boat launch needs to be dug back.	Washouts filled 4/25
15-May	N	N	Y		NZ / BM	RB - West side of boat launch needs to be dug back. will complete when river recedes	
24-Jun	N	N	N/A		NZ	Washouts not compromised RB - Not observed due to flooding	
10-Jul	N	N	N/A		NZ	RB - Not observed due to flooding	
6-Aug	Y	Y	Y		NZ / BM TL / JK	WP - Considerable washout, EP - 3 washouts (complete both ASAP) RB - Remove excess silt, and reshape bank. Excavation as weather permits.	WP - 8-14 / 8-20 RB - 8-21
16-Sep	N	Y	Y		NZ / BM	WP - Washouts not compromised, EP - will begin as weather permits. RB - excavation and reshaping continuing, no further concerns	
25-Sep	N	Y	Y		NZ / BM	Rain Event: No additional washouts, and repairs not compromised EP, RB excavation will resume	
2-Oct	N	N	Y		NZ / BM	EP - Washouts repaired, no additional issues observed RB - Still continuing with reshaping of W. side, no new concerns	EP - 10-1 / 10-2 RB - 10-10
11-Nov	N	N	N/A		NZ / BM	WP - Minor erosion to monitor, EP - No new concerns RB - Not observed due to flooding	
10-Dec	N	N	N		NZ	No additional concerns.	

COMMENTS:

BMP Inspection Form

Date: 7/10/24

Inspector: Jordan Fure

Reason for Inspection: Monthly Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good	-	-	7/10/24	Pond #1 is in good condition. Pond had a low water level at the time of inspection. Due to the last rain event being two-days prior on 7/8/24, and the water level being approximately 12 inches below the current outfall, this indicates that water is infiltrating.
Pond #2	Good	Re-seed access road to Pond #2.	-	7/10/24	Pond #2 is in good condition, but the path used during construction is showing signs of erosion and lack of grass/vegetative development. Path should be tilled and re-seeded to prevent this from creating unstable ground conditions, further erosion, and pollutant runoff.
Streambank	Flooded	-	-	7/10/24	Streambank and Park were flooded at the time of inspection due to recent rain events. Analysis of the current streambank condition was unable to be determined because of this.

Appendix B

Photos

Wauzeka WQT Inspection Photos

I. Water Quality Pond #1 - West



Image 1.1 – Outfall piping of Pond #1.



Image 1.2 – Vegetative growth within the Riprap at the Outfall of Pond #1.



Image 1.3 – East facing view of Pond #1.



Image 1.4 – Pre-sedimentation basin into Pond #1.



Image 1.5 – Riprap flow path from pre-sedimentation basin into Pond #1.



Image 1.6 – Pond #1 overflow and drainage structure with 100-year storm overflow shown.

II. Water Quality Pond #2 – East



Image 2.1 – South-facing view of Pond #2.



Image 2.2 – South-facing view Pre-sedimentation basin and Pond #2.



Image 2.3 – South-facing view from pre-pre-sedimentation riprap area with vegetative development and flow path.



Image 2.4 – Pond #2 overflow and drainage structure with 100-year storm overflow shown.



Image 2.5 – Outfall piping of Pond #2

January 31, 2026

Ms. Katie Jo Jerzak
Wisconsin Department of Natural Resources
1300 W. Clairemont Avenue
Eau Claire, WI 54701

Re: Annual Water Quality Trading Report #5
Village of Wauzeka, WI

Dear Katie Jo:

As requested and required by Schedule 4.2 Annual Water Quality Trading (WQT) Report of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit #WI-0022276-10-0, below, please find the Annual WQT Report for the Village of Wauzeka's Wastewater Treatment Facility. Please review for approval.

I. WQT Credit Use

Table 1 provides a summary of Total Phosphorus (TP) Credits used each month in 2025. Credits were calculated using the formulas in Section 2.2.2.2 of the Village's WPDES Permit. Table 2 Provides a summary of annual TP Credits used since 2021.

Table 1 – 2025 Monthly Average Phosphorus Data

Month	Outfall	Effluent Avg. Flow (MGD)	Effluent Avg. TP Concentration (mg/L)	Effluent Avg. TP Mass (lbs./day)	WQT Credits Used
Jan. ('25)	001	0.058	0.31	0.04	0.87
Feb. ('25)	001	0.016	0.34	0.04	0.89
Mar. ('25)	001	0.018	0.44	0.07	1.56
Apr. ('25)	001	0.027	0.84	0.18	4.94
May ('25)	001	0.024	0.90	0.18	4.82
Jun. ('25)	001	0.019	0.75	0.12	3.21
Jul. ('25)	001	0.027	0.42	0.10	2.27
Aug. ('25)	001	0.048	0.39	0.16	3.42
Sept. ('25)	001	0.022	0.49	0.09	2.18
Oct. ('25)	001	0.017	0.57	0.08	1.99
Nov. ('25)	001	0.016	0.80	0.11	2.75
Dec. ('25)	001	0.017	0.92	0.13	3.55
Average:		0.026	0.60	0.11	2.70

Table 2 – Summary of Annual TP Credits Used

Year	Effluent Avg. Flow (MGD)	Effluent Avg. TP Concentration (mg/L)	Effluent Avg. TP Mass (lbs./day)	Total WQT Credits Used
2021	0.043	0.55	0.21	21.55
2022	0.046	0.46	0.15	39.67
2023	0.035	0.61	0.30	53.73
2024	0.035	0.53	0.14	39.75
2025	0.026	0.60	0.11	32.45

II. Source of Credits

The Village of Wauzeka's WQT Plan (WQT-2021-0002) was approved on January 29, 2021. TP Credits were generated from a streambank stabilization project as described in the Village's WQT Plan. The WQT Plan approved **236.1 lbs./yr.** of TP Credits which were included in the latest WPDES Permit. Construction of the WQT Project was completed in Fall 2021 and credits were registered on October 26, 2021. The Village is currently using TP Credits to comply with the WWTF's Effluent TP Limit.

III. Annual Inspection

Annual inspection was completed in May 2025 with a few deficiencies identified. Stormwater Ponds #1 and #2 experienced minor washouts from the Spring snowmelt. Additionally, the streambanks silted over due to flooding in August. Otherwise, the BMPs were in good operating condition throughout the year with vegetation well established. Pond #2 washouts were filled and stabilized, and the silted streambanks were excavated and reshaped by November 2025. The remaining Pond #1 (West Pond) washouts are planned to be filled as soon as weather permits. Please see **Appendix A** for the Streambank Inspection Forms. Annual inspection will continue to be performed in the Spring of each year to ensure the trading practices remain in place and satisfy the WQT Plan. The Village of Wauzeka has operated and will continue to operate in accordance with the terms and conditions of its WPDES Permit and WQT Plan.

If you have any questions, please feel free to contact me at (608) 348-5355. Thank you.

Sincerely,
DELTA 3 Engineering, Inc.

Logan Hoppman

Logan Hoppman, P.E.
Civil-Environmental Engineer

LMH:lh

Cc: Jordan Fure – Delta 3 Engineering, Inc.
Bart Nies – Delta 3 Engineering, Inc.
Phyllis Groom – Village Clerk-Treasurer
Nick Zeeh – WWTF Operator

EVERY ANGLE COVERED



Appendix A
Streambank Inspection Forms

Village of Wauzeka

BMP Inspection Form

YEAR: 2025 * WP = West Pond/ *EP = East Pond/ *RB = River Bank

DATE:	NEEDS MAINTENANCE (Y / N):			INSP BY:	MAINTENANCE REQUIRED:	DATE COMPLETED:
	WEST POND:	EAST POND:	RIVER BANK:			
9-Jan	N	N	N	NZ / BM	Areas to watch on both ponds, however no major concerns	
5-Feb	Y	Y	N	NZ	WP- Moderate washouts on W. side will address in Spring Areas still to watch on both ponds RB- No immediate concerns.	
13-Mar	Y	Y	N	NZ	Same condition on all areas - will address as weather permits	
17-Apr	Y	Y	Y	NZ/BM	WP- No additional concerns vegetation filling in, will still address washouts asap. RB- West side needs contoured.	
14-May	Y	Y	Y	NZ	WP- Began filling in washouts, and re-shaping banks without vegetation EP- Reshaping will resume upon WB completion. RB- W. bank completed.	5/19/2025
5-Jun	Y	Y	N	NZ/JK/LH	WP-Reshaping, seeding continues, EP- No new concerns, reshaping will begin upon completion of WP repairs. RB-No new concerns.	7/1/2025
21-Jul	N	Y	N	NZ/BM	WP- Vegetation growing in well, EP- Hauled dirt to begin reshaping E. bank, RB- No new concerns	
13-Aug	N	Y	N	NZ/BM	WP- No additional concerns, EP-Holding water, will reshape upon dry conditions, RB- No new concerns.	
21-Aug	Y	Y	N	NZ/BM	WP- Washout reoccurred on NW side by rip-rap after considerable rainfall, EP- No new concerns, RB- flooded, but no concerns	
12-Sep	Y	Y	N	NZ	WP- washout will be addressed ASAP, EP- Needs reshaping - Both still holding water, RB- Dirt removed and reshaped.	9/16/2025
3-Oct	Y	Y	N	NZ	WP- Washout still needs addressing, EP- Still needs reshaping, Still holding water, No Additional Concerns	
5-Nov	Y	N	N	NZ	WP- Washout same status, EP- Reshaping complete No additional concerns	11/5/2025
17-Dec	Y	N	N	NZ	WP- Same status, No additional Concerns	

COMMENTS: WP washout will be addressed as weather permits, EP/RB have both been contoured, graded and suitable for vegetation growth

BMP Inspection Form

Date: 5/26/25

Inspector: Jordan Fure, P.E.

Reason for Inspection: Annual Inspection

Location/ Structure	Condition	Required Maintenance	Maintenance Estimate (Time or Cost)	Date Completed	Comments
Pond #1	Good-Fair	Fill Washouts	Approximately 4 weeks (weather depending)	-	Pond #1 is in fair condition. Several washouts present that need to be filled.
Pond #2	Good-Fair	Fill Washouts	Approximately 4 weeks (weather depending)	11/5/25	Pond #2 is in fair condition. Several washouts present that need to be filled.
Streambank	Good	-	-	-	Streambanks were in good condition with some minor overseeding recommended.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
1		Pond #1 Date Taken: 5/26/25 Comments: Outfall Piping of Pond #1 is in good condition and free of debris.
2		Pond #1 Viewing Direction: South Date Taken: 5/26/25 Comments: Resurfacing work being done on the west side of the pond during inspection. Vegetation will need to be reestablished following work.
3		Pond #1 Viewing Direction: Northwest Date Taken: 5/26/25 Comments: Pond was dry during inspection.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
4	 A photograph showing a close-up view of a riprap structure. The structure is composed of numerous light-colored, irregularly shaped stones and rocks, some of which are covered in green moss or algae. The riprap is situated on a sloping bank with green grass and some small trees in the background.	Pond #1 Viewing Direction: North Date Taken: 5/26/25 Comments: Riprap within the pre-sedimentation basin in place and vegetation has been well established.
5	 A photograph showing a wide view of a riprap flow path. The path is composed of light-colored, irregularly shaped stones and rocks, and is surrounded by green grass and some small trees. The path leads from a pre-sedimentation basin in the background towards a pond in the distance.	Pond #1 Viewing Direction: South Date Taken: 5/26/25 Comments: Riprap flow path from the Pre-sedimentation basin to Pond #1 is in good condition and vegetation surrounding the path has been well established
6	 A photograph showing a close-up view of a metal overflow and drainage structure. The structure is made of galvanized steel and has a conical roof with several vertical support poles. It is situated in a grassy area with some trees in the background.	Pond #1 Date Taken: 5/26/25 Comments: Overflow and drainage structure appears to be in good condition.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
7		Pond #2 Viewing Direction: East Date Taken: 5/26/25 Comments: Ponds were dry during inspection.
8		Pond #2 Viewing Direction: South Date Taken: 5/26/25 Comments: Banks of ponds appear to be in good condition with vegetation established.
9		Pond #2 Viewing Direction: South Date Taken: 5/26/25 Comments: Pre-sedimentation basin appears to be in good condition. Riprap is in place and vegetation is well established.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
10		Pond #2 Date Taken: 5/26/25 Comments: Pond #2 overflow and drainage structure appears to be in good condition
11		Pond #2 Date Taken: 5/26/25 Comments: Outfall Piping of Pond #2 is in good condition and free of debris.
12		Reach C: Kickapoo River Station: 115+50 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Vegetation has been well established. Riprap to the top of the bank has been covered with sediment.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
13		Reach C: Kickapoo River Station: 114+50 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Vegetation has been well established to the top of the bank with riprap still in place.
14		Reach B: Kickapoo River Station: 113+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Some areas of bare soil are present due to occasionally flooding, the area should be reseeded to reestablish vegetation.
15		Reach B: Morrey Creek Station: 111+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Some areas of bare soil are present due to occasionally flooding, the area should be reseeded to reestablish vegetation.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
16	 A photograph of the Kickapoo River at station 109+00. The river flows from the left towards the center. The right bank is a grassy field with some green plants in the foreground. In the background, there are several buildings and trees under a blue sky with clouds.	Reach A: Kickapoo River Station: 109+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Vegetation has been well established. Riprap to the top of the bank has been covered with sediment.
17	 A photograph of the Kickapoo River at station 108+00. The river flows from the left towards the center. The right bank is a grassy field with some green plants in the foreground. In the background, there are several buildings and trees under a blue sky with clouds.	Reach A: Kickapoo River Station: 108+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Vegetation has been well established with the riprap in place and in good condition.
18	 A photograph of the Kickapoo River at station 106+50. The river flows from the left towards the center. The right bank is a grassy field with some green plants in the foreground. In the background, there are several buildings and trees under a blue sky with clouds.	Reach A: Kickapoo River Station: 106+50 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Riprap flow path from culvert in place. Vegetation has been well established.

BMP Inspection Photos
May 2025 Annual Inspection
Village of Wauzeka

Photo Number	Site Photo	Comments
19	 A photograph of the Kickapoo River at Station 104+00. The river flows from the left towards the center. The right bank is covered in dense green vegetation, including tall grasses and shrubs. In the background, a small bridge and a red building are visible under a blue sky with some clouds.	Reach A: Kickapoo River Station: 104+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Vegetation has been well established.
20	 A photograph of the Kickapoo River at Station 103+00. The river flows from the left towards the center. The right bank features a line of riprap (rocks) along the water's edge, with green vegetation growing behind it. A bridge and trees are visible in the background.	Reach A: Kickapoo River Station: 103+00 Viewing Direction: Downstream Date Taken: 5/26/25 Comments: Riprap is in place and in good condition. Vegetation has been well established.