Permit Fact Sheet

General Information

Permit Number	WI-0020788-11-0
Permittee Name and Address	VILLAGE OF CROSS PLAINS 2417 Brewery Road PO Box 97, Cross Plains, WI 53528-0097
Permitted Facility Name and Address	Cross Plains Wastewater Treatment Facility 1000 MAIN STREET (USH 14), CROSS PLAINS, WISCONSIN
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	Approximately 400 feet upstream of the US 14 crossing
Receiving Water	Black Earth Creek in the Black Earth Creek Watershed of Lower Wisconsin River Basin in Dane County
Stream Flow ($Q_{7,10}$)	4.6 cfs
Stream Classification	Cold Water Class I Trout Stream and Exceptional Resource Water
Discharge Type	Existing continuous discharge
Annual Average Design Flow (MGD)	0.593 MGD
Industrial or Commercial Contributors	Plastics Ingenuity
Plant Classification	Advanced; A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Cross Plains operates a wastewater treatment facility providing secondary treatment and nutrient removal for a contributing population of approximately 4,400 people. Treated wastewater is continuously discharged to Black Earth Creek. Treatment consists of mechanical influent screening, selector basins to enhance biological phosphorus removal, oxidation ditch activated sludge secondary treatment, final clarification, and seasonal UV disinfection. Permanent phosphorus chemical treatment is in place but used infrequently due to the combination of biological phosphorus removal and Water Quality Trading credits available. Sludge is aerobically digested and goes through a gravity belt thickener prior to hauling to a different WPDES permitted facility. The facility does not usually land apply under their own permit, but hauls to Dane Iowa WWTF.

Substantial Compliance Determination

Enforcement During Last Permit: None

After a desktop review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on July 16, 2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Jordan Main on April 8, 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	0.39 MGD (January 2020 – December 2025)	Influent: 24-hour flow proportional composite sampler located immediately prior to influent Parshall flume at the influent wet well prior to mechanical screening.
001	0.38 MGD (December 2020 – October 2025 Average)	Effluent: 24-hour Flow Proportional Composite sampler located prior to UV disinfection, with grab samples obtained after the cascade aerator prior to discharge to Black Earth Creek. Flow is measured by ultrasonic meter and Parshall flume after UV disinfection prior to aeration and discharge.
002	17 Dry US Tons (2025 Permit Application)	Aerobically digested, Dewatered, Cake, Class B, Representative sludge samples shall be collected from the discharge of the gravity belt thickener.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

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

1.1.1 Changes from Previous Permit:

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

- **Flow –** The sample frequency for flow rate has been changed from "continuous" to "daily" for eDMR reporting purposes.

1.1.2 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

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	23 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
BOD5, Total	Weekly Avg	34 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
BOD5, Total	Monthly Avg	23 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
BOD5, Total	Weekly Avg	112.5 lbs/day	3/Week	Calculated	May through October
BOD5, Total	Weekly Avg	168.9 lbs/day	3/Week	Calculated	November through April
Suspended Solids, Total	Weekly Avg	23 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Suspended Solids, Total	Weekly Avg	34 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
Suspended Solids, Total	Monthly Avg	23 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
Suspended Solids, Total	Weekly Avg	112.5 lbs/day	3/Week	Calculated	May through October
Suspended Solids, Total	Weekly Avg	168.9 lbs/day	3/Week	Calculated	November through April

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	16 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	16 mg/L	3/Week	24-Hr Flow Prop Comp	May through September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	14 mg/L	3/Week	24-Hr Flow Prop Comp	October through April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.5 mg/L	3/Week	24-Hr Flow Prop Comp	October through April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	11 mg/L	3/Week	24-Hr Flow Prop Comp	May
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	10 mg/L	3/Week	24-Hr Flow Prop Comp	June
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	8.9 mg/L	3/Week	24-Hr Flow Prop Comp	July
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	9.5 mg/L	3/Week	24-Hr Flow Prop Comp	August
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	12 mg/L	3/Week	24-Hr Flow Prop Comp	September
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September annually. See the E. coli Percent Limit section. Enter the result in the DMR on the last day of the month.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	January through December 2030
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

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Plan Determination of Need schedule.
Temperature Maximum		deg F	Daily	Continuous	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term.
Phosphorus, Total		lbs/day	3/Week	Calculated	Report daily mass discharged using Equation 1a. in the Water Quality Trading (WQT) section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) section. Available TP Credits are specified in Table 2 and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	Monthly Avg	0.33 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	Monthly Avg	1.6 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3b. in the Water Quality Trading (WQT) section. Value entered on the last day of the month.
WQT Credits Used (TP)	Annual Total	122.8 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Monitoring section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) sections for monitoring dates and WET requirements.
Chronic WET	Monthly Avg	2.3 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) sections for monitoring dates and WET requirements.

2.1.1 Changes from Previous Permit

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

- **Flow –** The sample frequency for flow rate has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **Dissolved Oxygen and pH –** The sample frequency increased.
- **Chloride –** Sampling year updated.
- **E. coli –** Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. E. coli limits of 126#/100ml as a monthly geometric mean that may never be exceeded and 410#/100ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month are effective at the permit effective date.
- **PFOS and PFOA –** Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(b), Wis. Adm. Code. Additionally, see PFOS/PFOA Minimization Plan Determination of Need schedule below.
- **Temperature Maximum –** The sample frequency for temperature has been changed from 3/week to "Daily" to report daily maximum from continuous monitoring. Additionally, a schedule has been included to perform a Dissipative Cooling study in the month of October by the date specified in schedule 4.2 Dissipative Cooling Evaluation.
- **WQT Computed Compliance –** Concentration limit changed from 0.312 mg/L to 0.33 mg/L and mass limit changed from 1.5 lbs/day to 1.6 lbs/day. See Explanation of Limits and Monitoring Requirements.
- **WQT Credits Used –** Reporting added to meet standard WQT requirements.

- **Chronic WET –** Chronic WET limit of 2.3 TUc added with annual chronic sampling.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated March 04, 2026.

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. Sampling frequencies were increased for pH and dissolved oxygen to the standard sampling frequency for these parameters to better capture effluent quality. The sampling frequency for temperature was increased to report the daily maximum from continuous monitoring.

Disinfection/E. Coli – Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. Cross Plains had a schedule for complying with E. coli limits that concluded in 2025, so E. coli limits are included in this permit, and the fecal coliform parameter has been removed.

Disinfection shall be provided from May 1 to September 30 of each year. Monitoring requirements and the limitations for E. coli apply during the period in which disinfection is required.

Chloride – Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106, Wis Adm. Code, establishes the procedure for calculating WQBELs for chloride. This permit includes one year of sampling data to ensure 11 samples for permit reissuance purposes.

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 the type of discharge, the effluent flow rate, and the types of indirect dischargers contributing to the sewerage system, PFOS and PFOA monitoring is recommended at a once every two months frequency. 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.

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 Black Earth Creek is 75 ug/L. In this case, the WQBEL is 0.33 mg/L and 1.6 lbs/day (monthly 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 0.33 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 TBEL limit of 1.0 mg/L is retained in the permit.

The TP limits in this permit are based on the instream TP sampling completed prior to permit reissuance. A previous evaluation resulted in a WQBEL of 0.312 mg/L using a background concentration of 0.044 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream phosphorus concentrations shall be evaluated at each permit term. An evaluation of the data yielded a median background phosphorus concentration of 0.042 mg, resulting in an adjusted concentration and mass limits.

The wastewater treatment facility is often not able to meet the WQBEL through treatment alone. 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-2025-0015) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Village has implemented a barnyard improvement practice. The WQT Plan proposes the generation of 122.8 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.

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

Thermal- Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120 degrees F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects.

Based on calculations in the WQBEL memo dated March 04, 2026, weekly average temperature maximum limits would be necessary for Cross Plains in the months of August, September, October, November, and December. A mixing zone study completed on November 23, 2015 and a statement and no substantial changes to the facility supports the lack of temperature limits included in the reissued permit. Dissipative cooling requests must be re-evaluated each permit reissuance. The Department has determined based on effluent temperature data that due to the potential to exceed temperature limits in October, Cross Plains will need to conduct an additional Dissipative Cooling study during the month of October before the next permit reissuance.

Whole Effluent Toxicity- Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html.

ACUTE WET – Acute testing is required twice during the permit term as listed in the permit.

CHRONIC WET – Chronic testing is required annually in rotating quarters as listed in the permit.

According to requirements specified in NR 106.08 Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit is expressed as 2.3 TUc [=100/43] as a monthly average. Instream Waste Concentration (IWC) to assess chronic test results is 43%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25%, & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from Black Earth Creek.

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	Hauled to another facility	Hauled to another facility	Hauled to another facility	17
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**, design flow is less than 5MGD (0.593 MGD).						

3.1 Sample Point Number: 002- HAULED SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	Monitoring only required if land application occurs.
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	Monitoring only required if land application occurs.
Phosphorus, Total		Percent	Annual	Composite	Monitoring only required if land application occurs.
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	Monitoring only required if land application occurs.
Potassium, Total Recoverable		Percent	Annual	Composite	Monitoring only required if land application occurs.
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2028
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2028
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.

3.1.1 Changes from Previous Permit:

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

PCB –PCB monitoring is included at a frequency of "Once" in the permit term. No PCB monitoring has been completed on Outfall 002 sludge in recent history.

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

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA 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 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 an annual WQT report that shall cover the previous year.	01/31/2030
Annual WQT Report #5: Submit the 5th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	01/31/2031
Annual WQT Report Required After Permit Expiration: In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

4.1.1 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 trading plan that have not been reported in discharge monitoring reports;
- Any applicable notices of termination or management practice registration; and
- A summary of credits used each month over the calendar year

4.2 Dissipative Cooling Evaluation

This schedule requires the permittee to conduct a dissipative cooling evaluation by the specified due date.

Required Action	Due Date
Report on Effluent Discharges: Submit a dissipative cooling evaluation on effluent temperature with conclusions regarding compliance. Dissipative cooling study must be conducted in the month of October during the second year of the permit term and submitted to the Department by the listed due date. Refer to the Surface Water subsections regarding 'Determination of Need for Effluent Limits' and 'Dissipative Cooling Demonstration - Weekly Average Limits' concerning requests for a Department determination on the need for limits and follow-up procedures for demonstration of dissipative cooling per NR 106.59, as well as re-evaluation of the limits pursuant to NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code.	12/31/2028

4.2.1 Explanation of Schedule

A compliance schedule is included in the permit to ensure that a dissipative cooling evaluation is completed during the month of October once during the permit term. See the Explanation of Limits and Monitoring Requirements section above for more information about Thermal requirements.

4.3 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.	07/01/2027
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA 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	07/01/2028

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.	

4.3.1 Explanation of Schedule

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

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

4.4 Land Application Management Plan

A management plan is required for the land application system if sludge is land applied by permittee instead of hauled to another facility.

Required Action	Due Date
Land Application Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. Plan shall be submitted 60 days prior to land application.	

4.4.1 Explanation of Schedule

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

Attachments

Water Quality-Based Effluent Limitations for the Village of Cross Plains WPDES Permit No. WI-0000000-10-0, by Zainah Masri, Water Resources Engineer, dated March 04, 2026.

WQT Approval Letter dated July 15th, 2025.

WQT Plan revised April 2025.

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Laura James, Water Resources Management Specialist **Date: May 04, 2026**

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: March 04, 2026

TO: Jennifer Jerich – SCR/Horicon

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Cross Plains Wastewater Treatment Plant WPDES Permit No. WI-0020788-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable) for the discharge from the Cross Plains Wastewater Treatment Facility in Dane County. This municipal wastewater treatment facility (WWTF) discharges to Black Earth Creek located in the Black Earth Creek Watershed in the Lower Wisconsin River (LW17) 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 May – October November – April			 23 mg/L 112.5 lbs/day 34 mg/L 168.9 lbs/day	 23 mg/L 30 mg/L		 1,3
TSS May – October November – April			 23 mg/L 112.5 lbs/day 34 mg/L 168.9 lbs/day	 23 mg/L 30 mg/L		 1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				4
Ammonia Nitrogen May June July August September October – April	 16 mg/L 16 mg/L 16 mg/L 16 mg/L 16 mg/L 16 mg/L		 **16 mg/L** **16 mg/L** **16 mg/L** **16 mg/L** **16 mg/L** 14 mg/L	 11 mg/L 10 mg/L 8.9 mg/L 9.5 mg/L 12 mg/L 6.5 mg/L		 1,5
Bacteria						
Final Limit *E. coli*				126 #/100 mL geometric mean		6
Chloride						7
PFOS and PFOA						8
Temperature						9

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Phosphorus						
MCL				1.0 mg/L		
Final Limit Mass Limit				0.33 mg/L 1.6 lbs/day		10
TKN, Nitrate+Nitrite, and Total Nitrogen						11
Acute WET						12,16
Chronic WET				2.3 TUc		13,14,15,16, 17

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The BOD_5 mass limits are retained from water quality modeling that was done in 1978 and calculated assimilative capacity. They are recalculated and maintained to be protective of water quality. A description from the WQBEL dated March 30, 2004 is included in attachment #5.
4. The Cross Plains Wastewater Treatment Facility receives a daily minimum of 7.0 mg/L to be protective of the receiving water's Coldwater designation.
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 final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
8. 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.
9. Temperature monitoring is required, along with an additional DC study during the month of October prior to the next permit reissuance.
10. The phosphorus limit of 1.0 mg/L as a monthly average is recommended during the reissued permit term to serve as the MCL.
11. 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 nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
12. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) **2 acute WET tests during the permit term are recommended in the reissued permit.** According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.
13. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) **1 yearly chronic WET test are recommended in the reissued permit.**

14. According to the requirements specified in s. NR 106.08, Wis. Adm. Code a chronic WET limit is required. The chronic WET limit shall be expressed as 2.3 TUc [=100/43] as a monthly average in the effluent limits table of the permit. Instream Waste Concentration (IWC) to assess chronic test results is 43%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from Black Earth Creek.
15. A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
16. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.
17. Chronic testing should continue after the permit expiration date (until the permit is reissued).

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

Attachments (5) – Narrative, Map, Ammonia Nitrogen Calculations, Thermal Table and BOD_5 calculations

PREPARED BY: Zainah Masri, Water Resources Engineer Zainah Masri

APPROVED BY: Diane Figiel Date: 03/04/2026
Diane Figiel, PE,
Water Resources Engineer

E-cc: Jordan Main, Wastewater Engineer – SCR/Fitchburg
Lisa Creegan Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Environmental Engineering Manager – WY/3
Kari Fleming, Natural Resources Program Manager– WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Cross Plains Wastewater Treatment Facility

WPDES Permit No. WI-00270788-11-0

Prepared by: Zainah Masri – WY/3

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Cross Plains operates a wastewater treatment facility providing secondary treatment and nutrient removal for the contributing population of approximately 4400 people. Treated wastewater is continuously discharged to Black Earth Creek. Treatment consists of mechanical influent screening, selector basins to enhance biological phosphorus removal, oxidation ditch activated sludge secondary treatment, final clarification, and seasonal UV disinfection, followed by fine bubble aeration directly prior to discharge. Permanent phosphorus chemical treatment is in place but used infrequently due to the combination of biological phosphorus removal and Water Quality Trading credits available. Sludge is aerobically digested and goes through a gravity belt thickener prior to hauling to a different WPDES permitted facility. The facility does not land apply under their own permit.

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

Existing Permit Limitations

The current permit, which expired on December 31, 2025 includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5 May – October November – April			 23 mg/L 112.5 lbs/day 34 mg/L 168.9 lbs/day	 23 mg/L 30 mg/L		1,3
TSS May – October November – April			 23 mg/L 112.5 lbs/day 34 mg/L 168.9 lbs/day	 23 mg/L 30 mg/L		1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				4
Ammonia Nitrogen May June	 16 mg/L 16 mg/L		 **16 mg/L** **16 mg/L**	 11 mg/L 10 mg/L		2

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
July August September October – April	16 mg/L 16 mg/L 16 mg/L 16 mg/L		**16 mg/L** **16 mg/L** **16 mg/L** 14 mg/L	8.9 mg/L 9.5 mg/L 12 mg/L 6.5 mg/L		
Bacteria						
Final Limit *E. coli*				126 #/100 mL geometric mean		1, 5
Chloride						6
Phosphorus WQT Final				 1.0 mg/L 0.312 mg/L 1.5 lbs/day		7
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Temperature						9
Acute WET						10
Chronic WET						10,11,12

Footnotes:

1. 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.
2. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.
3. The BOD_5 mass limits are retained from water quality modeling that was done in 1978 and calculated assimilative capacity. They are recalculated and maintained to be protective of water quality. A description from the WQBEL dated March 30, 2004 is included in attachment #5.
4. The Cross Plains Wastewater Treatment Facility receives a daily minimum of 7.0 mg/L to preserve the receiving water's Coldwater designation.
5. Bacteria limits apply during the disinfection season of May through September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Monitoring only from January 2024 – December 2024.
7. A compliance schedule is in the current permit to meet the final Total Phosphorus WQBEL by September 30, 2023.
8. 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 nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

9. Monitoring only three times a week throughout the permit term.
10. Acute tests were conducted twice during the permit term in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.
    - Acute: July 1, 2022 – September 30, 2022; January 1, 2024 – March 31, 2024

    Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in January 1, 2026 – March 31, 2026.
11. The IWC for chronic WET was 43% .
12. Chronic tests were conducted once each year, in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.
    - Chronic: April 1, 2021 – June 30, 2021; July 1, 2022 – September 30, 2022; October 1, 2023 –December 31, 2023; January 1, 2024 – March 31, 2024; April 1, 2025 – June 30, 2025

    Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in April 1, 2026 – June 30, 2026.

Receiving Water Information

- Name: Black Earth Creek
- Waterbody Identification Code (WBIC): 1248600
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water, Class I Trout stream, Exceptional Resource Water, nonpublic water supply, and recreational use.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS from USGS at Highway KP, just upstream of where Outfall 001 is located.

  7-Q_{10} = 4.6 cubic feet per second (cfs)

  7-Q_2 = 7 cfs

  Harmonic Mean Flow = 11 cfs using a drainage area of 26.1 mi^2
- Hardness = 316 mg/L as $CaCO_3$. This value represents the geometric mean of data from WET test receiving water samples dated February 2000 – June 2025.
- % 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 Brewery Creek in Dane County, located just upstream of the confluence with Black Earth Creek, is used for this evaluation because there is no data available for Black Earth Creek. Brewery Creek is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen and phosphorus are described later.
- Multiple dischargers: There are several other dischargers to the Black Earth Creek 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: Black Earth Creek is not impaired at the discharge location but is impaired for an unknown pollutant approximately seven miles downstream of the outfall where Vermont Creek and Black Earth Creek converge.

Effluent Information

- Design flow rate:
  Annual average = 0.593 million gallons per day (MGD)
  For reference, the actual average flow from December 2020 to October 2025 was 0.38 MGD.
- Hardness = 345 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in February 2025 to March 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 3 industrial contributors.
  - Plastics Ingenuity – Custom packaging manufacturer
  - B&B Laminates – Countertop manufacturer
  - Latitude Graphics – Digital and Screen Printers
- Additives: Cross Plains WWTF has included 3 additives in the permit application that have the potential to be present in Outfall 001 These additives are listed below:
  - Ferric Chloride – Phosphorus Removal
  - Polyclear CE 2603 – Sludge Thickening
  - Polyclear AL2000 – Polymer Solvent
  - 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 and the facility is not requesting increased dosages or use frequencies. Therefore, an additive review is not needed at this time.
- 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)
02/25/2025	4.4	04/01/2025	<3.2	05/06/2025	25
03/04/2025	3.2	04/08/2025	<3.2	05/13/2025	3.4
03/11/2025	3.3	04/15/2025	3.5	05/20/2025	3.7
03/18/2025	3.4	04/29/2025	4.3		
Mean = 4.9 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)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
01/17/2024	340	05/16/2024	300	09/05/2024	210
02/07/2024	310	06/12/2024	230	10/08/2024	200

Attachment #1

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
03/06/2024	330	07/03/2024	170	11/05/2024	170
04/02/2024	310	08/06/2024	170	12/03/2024	220
1-day P_{99} = 441 mg/L					
4-day P_{99} = 334 mg/L					

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

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD_5	7.2 mg/L*	22 lbs/day
TSS	6.5 mg/L	20 lbs/day
pH field	7.2 s.u.	-
Dissolved Oxygen	11 mg/L	-
Ammonia Nitrogen	0.24 mg/L*	-
E. coli	30 #/100 mL**	-
Phosphorus	0.30 mg/L	0.95 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 P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

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

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Cross Plains WWTF 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 for all the detected substances. 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 = 3.7 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	38	7.6	<1.1		
Cadmium	345	18	36	7.2	<0.17		
Chromium	301	4,446	8,892	1,778	<1.5		
Copper	345	50	100	20	4.9		25
Lead	345	354	708	142	<5.4		
Nickel	268	1,080	2,162	432	<4.7		
Zinc	333	345	689	138	25		
Chloride (mg/L)		757	1,514			441	340

* 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-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)
RECEIVING WATER FLOW = 1.2 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		148	-	333	67	<1.1	
Cadmium	175	3.8	0.61	7.8	1.6	<0.17	
Chromium	301	213	27	445	89	<1.5	
Copper	316	28	-	62	12	4.9	
Lead	316	85	33	150	30	<5.4	
Nickel	268	120	-	271	54	<4.7	
Zinc	316	329	185	510	102	25	
Chloride (mg/L)		395	-	890			334

* 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 = 2.8 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	0.61	1,477	295	<0.17
Chromium (+3)	3,818,000	27	15,261,135	3,052,227	<1.5
Lead	140	33	46	92	<5.4
Nickel	43,000	-	171,879	34,376	<4.7

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 2.8 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	-	53	11	<1.1

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required, but monitoring is recommended for chloride and PFOA's . Limits and/or monitoring recommendations are made in the paragraphs below:

Copper – Considering available effluent data from the current permit application dated from February 2025 to May 2025, the mean concentration 4.9 µg/L, with a maximum concentration of 25 µg/L. The maximum effluent concentration and mean concentration of the effluent data did not exceed the calculated daily maximum limit, **therefore concentration and mass limits, as well as monthly monitoring, are not required.**

Chloride – Considering available effluent data from the current permit term from December 2020 to October 2025 the 1-day P_{99} chloride concentration is 441 mg/L, and the 4-day P_{99} of effluent data is 334 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, **therefore no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – The permit application did not require monitoring for mercury because the Cross Plains Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from January 2021 to January 2023 was 0 mg/kg, with a maximum reported concentration of 0 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code.

Available monitoring sample data from the Cross Plains (PWS ID: 11302192) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
4/24/2023	674538001	BF489	0	0
4/24/2023	674538001	BF490	0	0.63
3/18/2024	726073001	AAJ182	0	0
		Average =	0	0.63

The limited data above shows the municipal water supply is below 1/5th of the applicable PFOS and PFOA criteria.

Previous monitoring produced a PFOS result of 0 ng/L and a PFOA result of 0.63 ng/L. These results are less than one fifth of the respective criteria for each substance. However, based on the type of discharge,

the effluent flow rate, and the types of indirect dischargers contributing to the sewerage system 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, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

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

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

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

Where:

A = 0.275 and B = 39.0 for a Cold-Water Category 1 fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1264 sample results were reported from December 2020 to October 2025. The maximum reported value was 7.5 s.u. (Standard pH Units). The effluent pH was 7.4 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.4 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.4 s.u. Therefore, a value of 7.4 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 7.4 s.u. into the equation above yields an ATC = 15 mg/L.

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

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

Attachment #1

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	31
1-Q_{10}	77

The 2×ATC method yields the most stringent limits for Cross Plains Wastewater Treatment Facility.

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

Daily Maximum Ammonia Nitrogen Limits – Cold water

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	72	7.0 < pH ≤ 7.1	44	8.0 < pH ≤ 8.1	9.3
6.1 < pH ≤ 6.2	71	7.1 < pH ≤ 7.2	39	8.1 < pH ≤ 8.2	7.6
6.2 < pH ≤ 6.3	69	7.2 < pH ≤ 7.3	35	8.2 < pH ≤ 8.3	6.3
6.3 < pH ≤ 6.4	67	7.3 < pH ≤ 7.4	31	8.3 < pH ≤ 8.4	5.2
6.4 < pH ≤ 6.5	65	7.4 < pH ≤ 7.5	27	8.4 < pH ≤ 8.5	4.3
6.5 < pH ≤ 6.6	63	7.5 < pH ≤ 7.6	23	8.5 < pH ≤ 8.6	3.5
6.6 < pH ≤ 6.7	60	7.6 < pH ≤ 7.7	19	8.6 < pH ≤ 8.7	3.0
6.7 < pH ≤ 6.8	56	7.7 < pH ≤ 7.8	16	8.7 < pH ≤ 8.8	2.5
6.8 < pH ≤ 6.9	52	7.8 < pH ≤ 7.9	14	8.8 < pH ≤ 8.9	2.1
6.9 < pH ≤ 7.0	48	7.9 < pH ≤ 8.0	11	8.9 < pH ≤ 9.0	1.8

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
Weekly and monthly average limits are not included in the current permit but are being evaluated here due to changes to ch. NR 106, Wis. Adm. Code. **The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in attachment #2.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from December 2020 to October 2025.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	4.1
4-day P_{99}	2.6
30-day P_{99}	1.1
Mean*	0.40

Attachment #1

Std	1.1
Sample size	771
Range	0.13-15

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

Ammonia Nitrogen mg/L	May	June	July	August	September	October – April
1-day P_{99}	2.9	4.8	10.1	0.5	0.5	2.9
4-day P_{99}	1.6	3.2	6.7	0.3	0.3	1.6
30-day P_{99}	0.76	1.33	2.80	0.22	0.23	0.74
Mean*	0.43	0.42	0.90	0.18	0.18	0.38
Std	0.62	1.40	2.95	0.10	0.10	0.65
Sample size	66	66	65	67	64	443
Range	<0.13 - 3.38	<0.13 - 9.05	<0.13 - 15	<0.13 - 0.57	<0.13 - 0.41	<0.13 - 4.67

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

Reasonable Potential

The permit currently has daily maximum limits year-round as well as weekly and monthly average limits year round. **Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:**

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

Conclusions and Recommendations

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

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
May	16	**16**	11
June	16	**16**	10
July	16	**16**	8.9
August	16	**16**	9.5
September	16	**16**	12
October – April	16	14	6.5

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

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit

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

Since Cross Plains WWTF has phosphorus limits in effect that are equal to and more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.

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

Water Quality-Based Effluent Limits (WQBEL)

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

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

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

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

Where:

WQC = 0.075 mg/L for Black Earth Creek
Qs = 100% of the 7-Q_2 of 7 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 = 0.593 MGD = 0.918 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

A previous evaluation resulted in a WQBEL of 0.312 mg/L using a background concentration of 0.044 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

In-stream Phosphorus Study

The Village of Cross Plains conducted an in-stream phosphorus study in Black Earth Creek upstream of Outfall 001 from May 2016 through October 2016 and May 2017 through October 2017 in order to ascertain the background phosphorus concentration. Data from this study is shown below.

Date	Phosphorus mg/L	Date	Phosphorus mg/L
5/16/2016	0.027	5/15/2017	0.040
6/15/2016	0.400	6/12/2017	0.037
7/15/2016	0.039	7/17/2017	0.110
8/15/2016	0.050	8/14/2017	0.037
9/15/2016	0.065	9/6/2017	0.038
10/14/2016	0.044	10/13/2017	0.051

An evaluation of the data yielded a median background concentration of 0.042 mg/L.

Substituting a median value of 0.042 mg/L into the limit calculation equation above, the calculated limit is 0.33 mg/L, according to NR 207.021(3)(b)1.c this increase in the limit does not meet the definition of an increased discharge, and therefore an antidegradation review is not needed.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from December 2020 to October 2025.

Total Phosphorus Effluent Data

	Phosphorus mg/L
1-day P_{99}	1.1
4-day P_{99}	0.6
30-day P_{99}	0.41
Mean	0.30
Std	0.21
Sample size	771
Range	0.01 - 1.6

Reasonable Potential Determination

In accordance with s. NR 217.15(1), Wis. Adm. Code, there is reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria.

Mass Limits

A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is upstream of a phosphorus impaired waterbody. **This final mass limit shall be 0.33 mg/L × 8.34 × 0.593 MGD =1.6 lbs/day expressed as a monthly 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 a MCL must be set as a limit not to be exceeded at the outfall location. **Therefore, the phosphorus limit of 1.0 mg/L as a monthly average is recommended during the reissued permit term to serve as the MCL.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from December 2020 to October 2025.

The table below summarizes the maximum temperatures reported during monitoring from December 2020 to October 2025. The complete thermal limit calculation is included as attachment #4.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	51	53	67	118
FEB	51	52	68	110
MAR	53	55	72	115
APR	55	57	72	102
MAY	62	63	73	91
JUN	65	66	71	78
JUL	68	68	69	77
AUG	**68**	69	**67**	82

Attachment #1

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
SEP	**67**	68	**63**	81
OCT	**65**	66	**58**	91
NOV	**59**	60	**56**	98
DEC	55	55	62	111

Reasonable Potential
Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, and weekly average temperature maximum limits would be necessary for the months of August, September, October, November and December.

However, the Cross Plains Wastewater Treatment Facility has a previous dissipative cooling study completed as a mixing zone study completed on November 23, 2015 and a statement that there have not been substantial changes to the facility. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit. **Temperature monitoring is recommended per the requirements of s. NR 106.59(7), Wis. Adm. Code.**

Future WPDES Permit Reissuance
Dissipative cooling (DC) requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:

a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

The department has reevaluated the data in the dissipative cooling study submitted and found that due to the temperature differential for October **it is necessary for Cross Plains Wastewater Treatment Facility to conduct an additional DC study during the month of October prior to the next permit reissuance.**

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

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

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 43%,** shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

Q_e = annual average flow = 0.593 MGD = 0.920 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 4.6 cfs ÷ 4 = 1.2 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in

chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

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

WET Data History

Date Test Initiated	Acute Results LC_{50} % (% survival in 100% effluent)				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
08/12/1997	>100	>100	Pass	No	70.5	-	-	No	1,2
08/11/1998	>100	83.4	Fail	No	7.5	>80	Fail	No	1,2
09/29/1998	>100	>100	Pass	No	-	-	-	No	1,2
11/10/1998	>100	>100	Pass	No	>80	>80	Pass	No	1,2
07/27/1999	-	-	-	-	-	>80	Fail	No	1,2
09/07/1999	-	-	-	-	>80	-	Pass	No	1,2
02/08/2000	-	-	-	-	>100	>100	Pass	No	1,2
06/01/2000	>100	>100	Pass	No	>100	-	Fail	No	1,2
09/06/2001	>100	>100	Pass	No	>100	>100	Pass	No	1,2
11/13/2001	-	-	-	-	93.65	>100	Pass	No	1,2
03/07/2002	-	-	-	-	>100	>100	Pass	No	1,2
06/20/2002	-	-	-	-	>100	>100	Pass	No	1,2
08/07/2003	-	-	-	-	>100	>100	Pass	No	1,2
08/16/2007	>100	>100	Pass	Yes	>100	100	Pass	Yes	-
10/21/2008	>100	>100	Pass	No	>100	84.75	Pass	No	3
03/17/2009	-	-	-	-	>100	>100	Pass	No	3
10/27/2009	>100	>100	Pass	No	>100	>100	Pass	No	3
06/26/2012	>100	>100	Pass	Yes	-	-	-	-	-
09/17/2013	>100	>100	Pass	Yes	53	>100	Pass	Yes	-
02/25/2014	-	-	-	-	44.7	41.8	Fail	Yes	-
03/18/2014	-	-	-	-	>100	>100	Pass	Yes	-
04/15/2014	-	-	-	-	77	47	Pass	Yes	-
07/19/2016	-	-	-	-	>100	>100	Pass	Yes	-
06/12/2018	-	-	-	-	27.5	>100	Fail	Yes	-
08/14/2018	-	-	-	-	>100	>100	Pass	Yes	-
02/11/2020	-	-	-	-	>100	47.1	Pass	Yes	-
06/08/2021	-	-	-	-	>100	>100	Pass	Yes	-
08/16/2022	>100	>100	Pass	Yes	>100	45.5	Pass	Yes	-

Attachment #1

Date Test Initiated	Acute Results LC_{50} % (% survival in 100% effluent)				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
10/24/2023	-	-	-	-	>100	>100	Pass	Yes	-
01/30/2024	>100	>100	Pass	Yes	>100	>100	Pass	Yes	-
03/19/2024	-	-	-	-	>100	>100	Pass	Yes	-
04/09/2024	-	-	-	-	>100	>100	Pass	Yes	-

Footnotes:

1. *Data No Longer Representative.* The Village completed a modification to the wastewater treatment facility in 2005/2006. This included modifications to the existing oxidation ditch and clarifier. Therefore, any data collected before the facility's upgrade is no longer representative.
2. *Data Not Representative.* Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. It may be appropriate to exclude data collected before July 1, 2005, unless 1) it shows repeated toxicity that was never resolved or 2) older data is all that is available, and no significant changes have occurred which obviously make it unrepresentative. Ammonia limits were added to the permit in 2005 based on updated water quality criteria.
3. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

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

  Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]

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

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

  Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/ 27.5= 2.2 TU_c	2.1 Based on 6 detects	43%

[(TUc effluent) (B)(IWC)] = 3.3 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from August 2007 to April 2024.

Expression of WET limits

Chronic WET limit = [100/43] TU_c = 2.3 TU_c expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 43%. **10 Points**
Historical Data	Five tests used to calculate RP. No tests failed. **0 Points**	15 tests used to calculate RP. 2 tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Exceptional Resource Water **12 Points**	Same as Acute. **12 Points**
Chemical-Specific Data	Ammonia nitrogen limit carried over from the current permit. Zinc, Copper, Chloride detected. **3 Points**	Ammonia nitrogen limit carried over from the current permit. Zinc, Copper, Chloride detected. **3 Points**
Additives	0 Biocides and 3 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place	All additives used more than once per 4 days.

Attachment #1

	Acute	Chronic
	3 Points	**3 Points**
Discharge Category	No Industrial Contributors. **0 Points**	Same as Acute. **0 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**18 Points**	**28 Points**
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	1x yearly Due to a WET limit being given
Limit Required?	No	Yes Limit = 2.3 TU_c
TRE Recommended? (from Checklist)	No	No

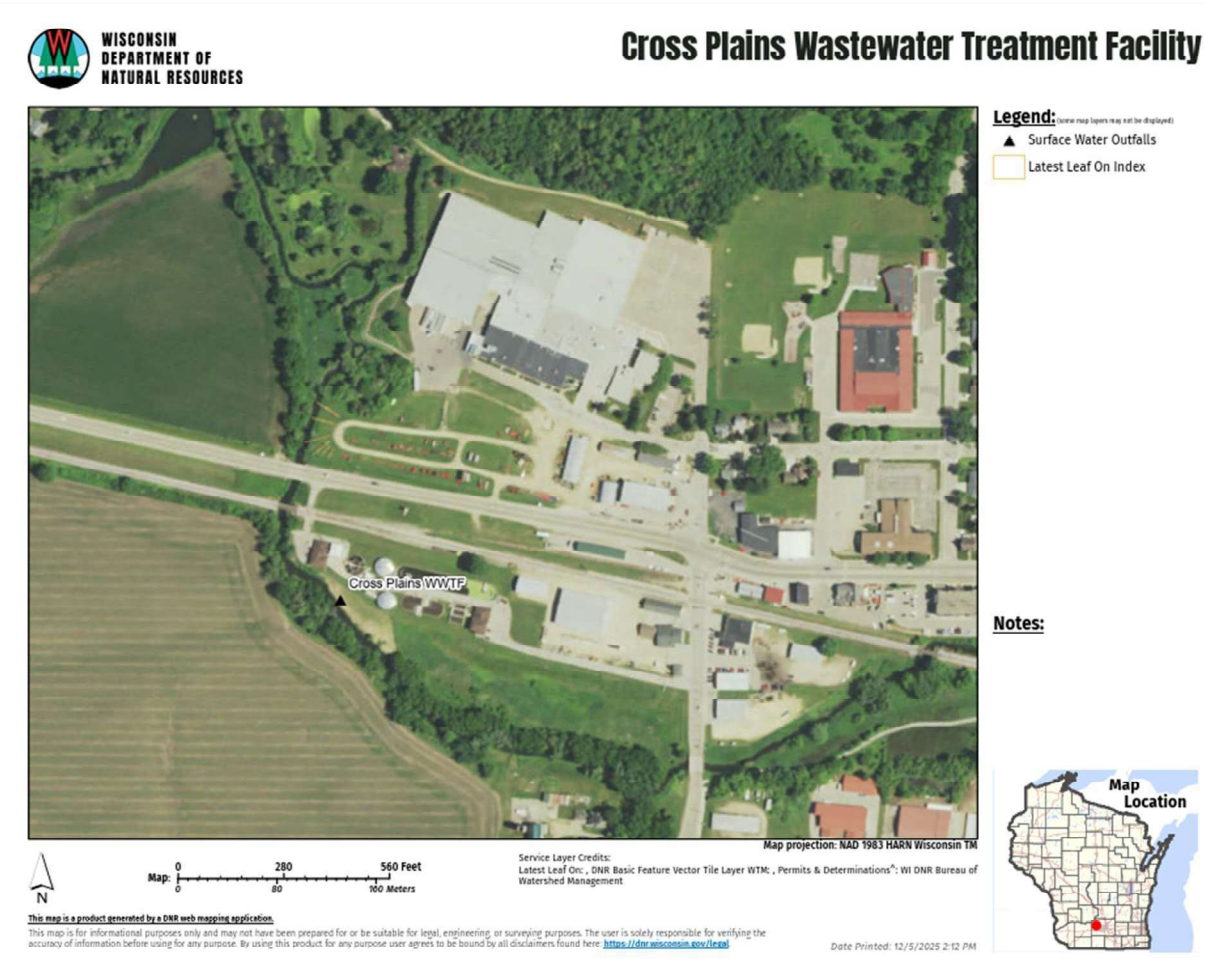
- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, **2 acute WET tests during the permit term and 1 yearly chronic WET test are recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Chronic testing should continue after the permit expiration date (until the permit is reissued).

- According to the requirements specified in s. NR 106.08, Wis. Adm. Code a chronic WET limit is required. The chronic WET limit shall be expressed as 2.3 TUc as a monthly average in the effluent limits table of the permit.

- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.

Attachment #2

Site Map:



Ammonia Nitrogen Calculations from the WQBEL Memo Dated September 22, 2009

AMMONIA (as N) LIMITS							
CLASSIFICATION:		**COLDWATER**					
EFFLUENT FLOW (mgd):		0.593					
EFFLUENT FLOW (cfs):		0.918					
MAX. EFFLUENT pH (s.u.):		7.80					
BACKGROUND INFORMATION:		**Jan.**	**Feb.**	**March**	**April**	May	**June**
7Q10 (cfs)		4.6	4.6	4.6	4.6	4.6	4.6
7Q2 (cfs)		7	7	7	7	7	7
Ammonia (mg/L)		0.12	0.12	0.12	0.06	0.06	0.06
Temperature (deg C)		5	5	5	9	17	19
pH (std. units)		7.97	7.97	7.97	7.97	8.21	8.21
% of river flow used:		25	25	25	25	100	100
Reference weekly flow:		1.15	1.15	1.15	1.15	4.6	4.6
Reference monthly flow:		1.4875	1.4875	1.4875	1.4875	5.95	5.95
CRITERIA (in mg/L):							
4-day Chronic (@ backgrd. pH):							
early life stages present		6.35	6.35	6.35	6.35	3.76	3.30
30-day Chronic (@ backgrd. pH)							
early life stages present		2.54	2.54	2.54	2.54	1.50	1.32
EFFLUENT LIMITS (in mg/L):							
Weekly average							
early life stages present		14.16	14.16	14.16	14.23	22.31	19.57
Monthly average							
early life stages present		6.46	6.46	6.46	6.56	10.87	9.50

Continued						
BACKGROUND INFORMATION:	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
7Q10 (cfs)	4.6	4.6	4.6	4.6	4.6	4.6
7Q2 (cfs)	7	7	7	7	7	7
Ammonia (mg/L)	0.06	0.06	0.06	0.05	0.05	0.12
Temperature (deg C)	20	19	16	9	5	5
pH (std. units)	8.21	8.21	8.21	7.97	7.97	7.97
% of river flow used:	100	100	100	25	25	25
Reference weekly flow:	4.6	4.6	4.6	1.15	1.15	1.15
Reference monthly flow:	5.95	5.95	5.95	1.4875	1.4875	1.4875
CRITERIA (in mg/L):						
4-day Chronic (@ backgrd. pH):						
early life stages present	3.10	3.30	4.01	6.35	6.35	6.35
30-day Chronic (@ backgrd. pH)						
early life stages present	1.24	1.32	1.60	2.54	2.54	2.54
EFFLUENT LIMITS (in mg/L):						
Weekly average						
early life stages present	18.33	19.57	23.81	14.25	14.25	14.16
Monthly average						
early life stages present	8.89	9.50	11.62	6.58	6.58	6.46

Thermal Table:

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Cross Plains WWTF		**7-Q_{10}:**	4.60	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:**	12/01/20	12/01/20
Date Prepared:			**f:**	0		**End:**	10/31/25	10/31/25
Design Flow (Qe):	0.59	MGD	**Stream type:**	Cold water community			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	1.3	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	35	47	68	4.60	0.455	0.490	0	51	53	67	118
FEB	36	47	68	4.60	0.388	0.563	0	51	52	68	110
MAR	39	51	69	4.60	0.415	0.485	0	53	55	72	115
APR	47	57	70	4.60	0.492	0.537	0	55	57	72	102
MAY	56	63	72	4.60	0.548	0.620	0	62	63	73	91
JUN	62	67	72	4.60	0.895	1.283	0	65	66	71	78
JUL	64	67	73	4.60	1.066	1.522	0	68	68	69	77
AUG	63	65	73	4.60	0.788	0.817	0	68	69	67	82
SEP	57	60	72	4.60	0.741	1.212	0	67	68	63	81
OCT	49	53	70	4.60	0.556	0.751	0	65	66	58	91
NOV	41	48	69	4.60	0.642	0.729	0	59	60	56	98
DEC	37	47	69	4.60	0.512	0.564	0	55	55	62	111

BOD_5 Calculations from WQBEL dated March 30, 2004

Effluent Limitations for BOD_5: Based on water quality modeling that has been done in 1978 stream has a little more assimilative capacity than using the 13 # method formula which is typically used for calculation of BOD_5 limits. From the modeling results the allowable loading is 112.5 lbs/day weekly average in summer and 168.9 lbs/day weekly average BOD_5 in winter without damaging the water quality of the stream. Maintaining these mass limits in the permit would be protective of water quality of the stream. Therefore, keeping these mass limits in the permit with increased discharge flow of 0.593 mgd would allow concentration limit of 22.75 mg/L [112.5 lb/d = 0.593 mgd x 8.34 x effluent concentration of BOD_5 (mg/L)] for summer and 34.15 mg/L [168.9 lb/d = 0.593 mgd x 8.34 x effluent concentration of BOD_5 (mg/L)] for winter. It is recommended that a weekly average limit of 23 mg/L (112.5 lbs/d) for summer and a weekly average 34 mg/L (168.9 lbs/d) and monthly average 30 mg/L for winter be considered for facility planning at design flow of 0.593 mgd.

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

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

July 15, 2025

Carly Persson, Village Administrator
2417 Brewery Rd.
Cross Plains, WI 53528-0097

Subject: Cross Plains Wastewater Treatment Facility - WPDES Permit WI-0020788
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Carly Persson:

The Department recently received a water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the Cross Plains Wastewater Treatment Facility. The initial plan was received in March of 2025 and an updated version was received in May of 2025. Based on WDNR review, the final WQT Plan (dated May 2025) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes improvements to a barnyard. Credit generation began in 2023, with the first permit term WQT approval (WQT-2020-0006). Credits generated from approved practices result in available credit quantities shown in Table 1. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limits.

Please note that this WQT plan approval is not to be construed as approval to commence work regulated under other state or local authorities, such as Chapter 30 waterways and wetlands permitting, floodplain, or construction activities.

Table 1: Total Phosphorus Credits Available per WQT-2025-0015

Year	Available Credits (lbs/yr) – Total
2025	122.8
2026	122.8
2027	122.8
2028	122.8
2029	122.8
2030	122.8
2031	122.8

The Department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The Department has assigned the WQT plan a tracking number of WQT-2025-0015 and will be referenced as such in the draft WPDES permit. The final WQT plan will be included as part of the public

notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring for total phosphorus.

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

Thank You,

BetsyJo Howe

BetsyJo Howe
SC Region WQT Coordinator
Wisconsin Department of Natural Resources

e-CC:

Ted Pritchett, Village of Cross Plains
Peter Riddle, Town & Country Engineering, Inc.
Evan Chambers, Town & Country Engineering, Inc.
Jordan Main, WDNR

Water Quality Trading Plan

Village of Cross Plains, Wisconsin
Wastewater Treatment Facility

April 2020
(Revised April 2025)

TOWN & COUNTRY
ENGINEERING, INC.

WATER QUALITY TRADING PLAN

Village of Cross Plains, Wisconsin
Wastewater Treatment Facility

April 2020
(Revised May 2025)

TOWN & COUNTRY ENGINEERING, INC.
Madison • Rhinelander • Kenosha
6462 Nesbitt Road
Madison, WI 53719
☎ (608) 273-3350 ♦ Fax: (608) 273-3391
tce@tcengineers.net

WATER QUALITY TRADING PLAN

Village of Cross Plains, Wisconsin
Wastewater Treatment Facility

April 2025

Table of Contents

TABLES

APPENDICES

1. EXECUTIVE SUMMARY

1.1 Introduction

The Village of Cross Plains submitted to the DNR in November 2018 a Phosphorus Preliminary Compliance Alternatives Plan which concluded that the lowest cost, feasible alternative for compliance with a future stringent Water Quality-Based Effluent Limit (WQBEL) for phosphorus was Water Quality Trading (WQT). Water Quality Trading involves working within the watershed to reduce phosphorus loading and arrange trades to offset the difference between the Wastewater Treatment Facility (WWTF) discharge of phosphorus and the allowable discharge to comply with a WQBEL.

The Village of Cross Plains has selected WQT as its compliance alternative. Provided in the Appendices of this plan are the Village's signed DNR Form 3400-206 (Notice of Intent to Conduct Water Quality Trading) and a signed DNR Form 3400-208 (WQT Checklist) for this plan.

1.2 Point Source and Receiving Waters

The Cross Plains WWTF has a design capacity of 0.593 MGD. The WWTF provides wastewater treatment through mechanical screening, selector basins for biological phosphorus removal, two single channel oxidation ditches, two final clarifiers, ultraviolet light disinfection, and effluent reaeration. The WWTF has an existing phosphorus removal chemical feed system as a backup to its biological phosphorus removal system.

The Cross Plains WWTF discharges its effluent into Black Earth Creek. Black Earth Creek is within the Lower Wisconsin River Basin, is classified as a cold-water community due to numerous cold-water springs upstream of the Village and is listed by the WDNR site as a Class 1 Trout Stream and an Outstanding Resource Water.

1.3 Target Phosphorus Water Quality Trading Credits

Based on phosphorus sampling taken from Black Earth Creek, the DNR has determined that 0.31 mg/L is the future phosphorus WQBEL for the Cross Plains WWTF. The Village has calculated on a monthly basis over the past 10 years the amount of phosphorus in its effluent at concentrations above this future WQBEL. The highest annual total occurred in 2015 when a total of 105.4 pounds of phosphorus at concentrations above the anticipated WQBEL were discharged. The Village of Cross Plains intent to use 105.4 pounds of phosphorus as the target annual water quality trading credits during its upcoming permit term beginning on January 1, 2026.

The Village has obtained a total number of phosphorus WQT credits in excess of the target so as to have a suitable reserve in the event of changed conditions or unforeseen events. The village has recently begun using their chemical phosphorus abilities at the WWTF to further ensure compliance with its WPDES permit.

1.4 Phosphorus Water Quality Trade

The Village has pursued one water quality trade with the property owners of a farm upstream of the Cross Plains WWTF in a different HUC-12 subwatershed. The owner of the farm property is referred to as "Landowner A" throughout this plan for privacy reasons. The farm includes a

barnyard of four concrete lots that hold a total of 118 cattle. The management practice that shall generate the water quality trading credits is removal of all but five cattle from the property, which was estimated by the Dane County Land & Water Resources Department as resulting in 147.3 pounds of reduced phosphorus discharge per year. The WQT has an updated delivery factor of 0.13 and an uncertainty factor of 1, resulting in a trade ratio of 1.2. Therefore, the WQT will provide the Village of Cross Plains with a phosphorus WQT credit of 122.75 pounds per year.

1.5 Implementation

A Water Quality Easement has been established between the Village of Cross Plains and Landowner A. This legal document has been signed by the property owners and representatives of the Village of Plains, notarized by a Notary Public, and recorded by the Dane County Register of Deeds. The Water Quality Easement restricts the property owners from having more than five beef cattle or other livestock on the property for a period of thirty years. It also gives the Village of Cross Plains the right to prevent inconsistent uses, the right to enter the property to monitor or to enforce the terms of the easement, and the right to prevent and correct violations of the provisions of the Easement. Operations and maintenance for this WQT management practice consists of enforcement of the Water Quality Easement, which will be done by Dane County Land & Water Resources Department acting on behalf of and in partnership with the Village of Cross Plains.

The Appendices contain a signed DNR Form 3400-207 (Water Quality Practice Registration) for the WQT.

This WQT Plan is hereby submitted to the DNR for inclusion in the Village's reissued WPDES permit. Based on feedback received from the Department on the Village's Draft WQT Plan, this Final WQT Plan clarifies items associated with the uncertainty factor and downstream practices.

The Village expects for the WQT Plan revision to be public noticed in conjunction with its WPDES permit within the next six months. The current WPDES permit for the Cross Plains WWTF will expire on December 31, 2025.

2. INTRODUCTION

2.1 Selected Phosphorus Compliance Alternative

The current discharge permit for the Cross Plains Wastewater Treatment Facility (WWTF) is Wisconsin Permit Discharge Elimination System (WPDES) number WI-0020788-10-1. It has an effective date January 1, 2021, and an expiration date of December 31, 2025.

The Village of Cross Plains was required by their WWTF's current discharge permit to develop a Phosphorus Preliminary Compliance Alternatives Plan to evaluate compliance alternatives with a future stringent Water Quality-Based Effluent Limit (WQBEL). Submitted to the DNR in November 2018, the Village's Phosphorus Preliminary Compliance Alternatives Plan concluded that the lowest cost, feasible alternative for compliance with a future stringent WQBEL was found to be Water Quality Trading (WQT). Water quality trading involves working within the watershed to reduce phosphorus loading and arrange trades to offset the difference between the WWTF's discharge of phosphorus and the allowable discharge to comply with a WQBEL.

The Village of Cross Plains has selected WQT as its compliance alternative, and Appendix B contains the Village's signed DNR Form 3400-206 (Notice of Intent to Conduct Water Quality Trading).

Appendix C contains a signed DNR Form 3400-208 (WQT Checklist) for this WQT plan.

2.2 Community Background

The Village of Cross Plains is located in western Dane County, Wisconsin, roughly ten miles west of Madison. The population of the Village of Cross Plains was found to be 3,538 during the 2010 census, and is estimated by the Wisconsin Department of Administration to be 3,974 as of January 1, 2018. The Village is expected to grow steadily in the future, reaching a projected population of 4,320 in 2040.

2.3 Existing Wastewater Facilities

The Cross Plains WWTF is located at 100 Main Street, on the southern side of U.S. Highway 14, and east of Black Earth Creek.

Wastewater flows to the Cross Plains WWTF from a combination of residential and commercial sources from the Village. There are no significant industrial sources of wastewater within the Village, and the WWTF does not accept hauled waste.

The Cross Plains WWTF was last upgraded in 2007 which included the construction of a new headworks, selector basins, oxidation ditch, final clarifier, and disinfection structure and associated equipment. Wastewater treatment is achieved through preliminary and secondary processes, along with ultraviolet light disinfection and effluent reaeration. Preliminary treatment processes include mechanical screening only. Secondary treatment is achieved through the use of two single channel oxidation ditches and final clarifiers. Phosphorus removal is accomplished through a biological treatment process within a series of selector basins post-screening and prior to the oxidation ditches.

The treatment process achieves biological nutrient removal (BNR) through the arrangement of anaerobic, anoxic and aerobic zones within the selector basins and oxidation ditches. The anaerobic zone promotes the production of volatile fatty acids (VFAs) and the initial release of phosphorus into the mixed liquor. In addition, the configuration of these different zones promotes the growth of phosphorus accumulating organisms (PAOs) which have been identified as being crucial to the biological nutrient removal mechanism. These PAOs release stored polyphosphates while in the anaerobic environments and in contact with VFAs. These PAOs then take up phosphorus while in the aerobic zone, which includes not only the previously released polyphosphates, but additional phosphorus in the influent wastewater. This is termed luxury uptake of phosphorus and results in a net decrease in the amount of soluble phosphorus in the liquid stream. Phosphorus is removed from the liquid process through wasting of settled biomass from the final clarifiers and processing in the solids treatment system.

The Village previously had the ability to add phosphorus removal chemicals (PRCs) to enhance phosphorus removal as a backup to the biological phosphorus removal system. The PRC could be added to the wastewater at the influent to either of the oxidation ditches or at the oxidation ditch effluent through the effluent splitter box, upstream of the final clarifiers. The WWTF has not needed PRCs for treatment since the 2007 upgrade and as a result the PRC system fell into disrepair. The Village has replaced their chemical feed piping and pumps and now once again has the ability to utilize PRCs as a backup to combat high credit usage months. In 2024 the Village only added ferric chloride to the WWTF in July and August. Staff manually adjust the chemical feed pumps based on grab samples from the WWTF. It is estimated that less than 10 gallons per day were used while chemical addition was needed.

Biosolids are wasted from the final clarifiers to the aerobic digester for stabilization prior to thickening. Digested sludge is pumped to a gravity belt thickener where thickened sludge is then stored temporarily before hauling to the Dane-Iowa WWTF for Class A treatment and storage.

The current design capacity of the Cross Plains WWTF is shown in Table 2-1.

Table 2-1
Design Capacity Cross Plains WWTF

Parameter	Design Capacity
Annual Average Flow (MGD)	0.593
BOD (lbs./day)	1,376
Suspended Solids (lbs./day)	1,493
Ammonia (lbs./day)	155
Phosphorus (lbs./day)	44.0

2.4 Cross Plains WWTF Effluent Discharge Summary

Previously reported data was provided in the November 2018 Phosphorus Preliminary Compliance Alternatives Plan. Dates previously reported in the previous permit term for this Water Quality Trading Plan were from January 2013 to September 2018. Table 2-2 is a summary of the effluent discharge from the Cross Plains WWTF from January 2020 to December 2024.

Table 2-2
Cross Plains WWTF Effluent Discharge Summary

Parameter	Max Year	Average Year	Min Year	Max Month	Min Month
Annual Average Flow (MGD)	.50	0.40	.30	0.85	0.27
BOD (lbs./day)	27.3	23.2	18.1	55.7	10.4
Suspended Solids (lbs./day)	25.4	20.6	16.2	49.9	8.8
Ammonia (mg/L)	0.55	0.45	0.26	4.01	0.13
Phosphorus (mg/L)	0.41	0.30	0.24	0.82	0.09
Phosphorus (lbs./day)	0.83	0.63	0.41	1.77	0.15

2.5 Applicable Effluent Limits

The Village of Cross Plains' current WPDES permit includes a phosphorus limit of 1.0 mg/L on a monthly average, and a future WQBEL in the absence of an approved phosphorus compliance alternative of 0.075 mg/L six-month seasonal average limit, with averaging periods of May through October and November through April, and a 0.225 mg/L monthly average limit.

The Cross Plains WWTF conducted in-stream water quality sampling for total phosphorus upstream of their discharge in Black Earth Creek at the County Highway KP bridge during May to October of 2016 and 2017 as approved by the DNR. The median value of this sampling was 0.042 mg/L. A map showing the sampling location and data are provided in Appendix D.

Appendix D also includes a May 9, 2019, e-mail from Sarah Luck, Water Resources Engineer, Wisconsin DNR to Evan Chambers and Ben Heidemann with Town & Country Engineering describing the DNR's calculation of the future WQBEL for the Cross Plains WWTF. Using the aforementioned Black Earth Creek sampling data, the DNR calculated an ambient background concentration of 0.042 mg/L using procedures specified in Section NR 217.13(2)(d), Wis. Adm. Code. Ms. Luck's e-mail states that the DNR anticipates the new phosphorus WQBEL for Cross Plains WWTF will be 0.31 mg/L as a monthly average concentration and 1.6 lbs./day as a monthly average mass limit. The assumptions used when calculating this future WQBEL were 7Q2 (lowest 7-day average flow that occurs on average once every 2 years) of 7.0 cfs, design flow of 0.593 MGD, and a phosphorus criterion of 0.075 mg/L for Black Earth Creek.

Throughout this plan, 0.31 mg/L will be used as the future phosphorus WQBEL for the Cross Plains WWTF.

2.6 Receiving Water Description and Conditions

Black Earth Creek is the receiving stream for the Cross Plains WWTF's effluent discharge. Black Earth Creek generally flows from east to west through the Village of Cross Plains.

Black Earth Creek is located within the Black Earth Creek Watershed (LW17) within the Lower Wisconsin River Basin. (Additional information on the Black Earth Creek Watershed is available at https://dnr.wi.gov/topic/watersheds/basins/lowerwis/.) Black Earth Creek is classified as a cold-water community due to numerous cold-water springs upstream of Cross Plains and is listed by the DNR site as a Class 1 Trout Stream and an Outstanding Resource Water. The 7-day / 10-year (7Q10) low flow at the discharge point is 4.6 cfs according to the Cross Plains WWTF's permit fact sheet.

Appendix E includes a map and land use data on the HUC-12 subwatershed in which the Cross Plains WWTF is located, as well as for the watershed upstream of the WWTF's discharge point.

2.7 Watershed Description and Condition

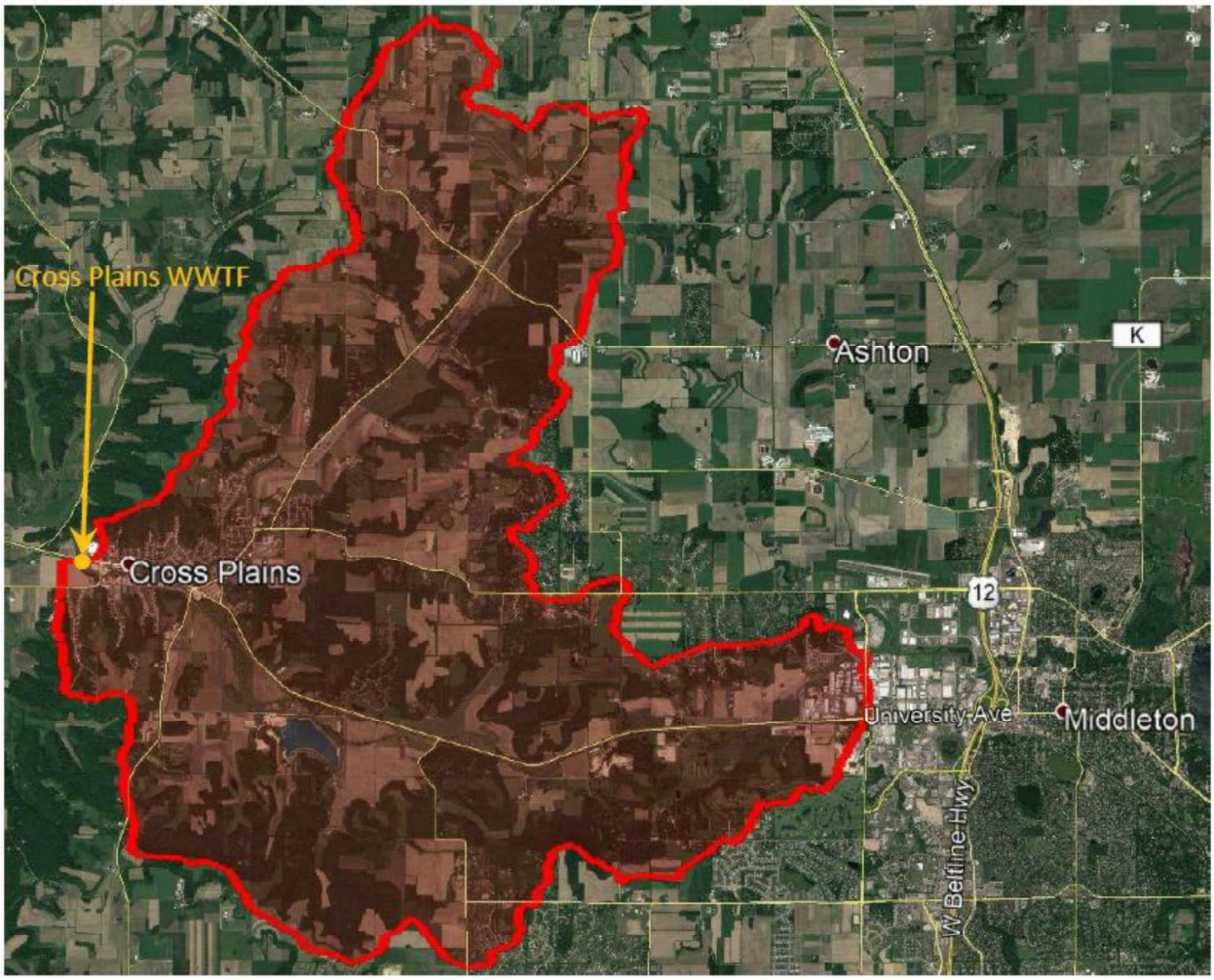
The DNR's Pollutant Load Ratio Estimation Tool (PRESTO) model states that the watershed area upstream of the Cross Plains WWTF's effluent discharge into Black Earth Creek is 26.6 square miles or 17,024 acres. The PRESTO model states that the upstream watershed is non-point source dominated with a ratio of point source to non-point source phosphorus of 3:97 using a total phosphorus load of 443 pounds per year for the Cross Plains WWTF. The PRESTO results are provided in Appendix E.

Maps of the watershed upstream of the Cross Plains WWTF outfall were created using Purdue University's Long Term Hydrologic Impact Analysis (L-THIA) on-line tool. One of these maps is shown in Figure 2-1. Appendix E contains two maps of the watershed upstream of the Cross Plains WWTF's discharge, and data of land use within the watershed. The watershed upstream of the Cross Plains WWTF outfall is 16,039 acres, consisting mainly of deciduous forest (31.0%), cropland generalized agriculture (28.6%), and pasture/hay (24.8%).

The USGS has divided watersheds into smaller hydrologic units that are classified by Hydrologic Unit Codes (HUC), with the smallest unit being the HUC-12 subwatershed. Water quality trading is most favorable when trading with upstream sources within the same HUC-12 subwatershed.

The Cross Plains WWTF is located in HUC-12 subwatershed 070700050502. Appendix E includes a map and land use data for this subwatershed, which encompasses 24,272 acres, of which the largest land uses are deciduous forest (38.9%), cropland generalized agriculture (26.5%), and pasture/hay (24.1%). The Wagner Dairy Farm has the only other permitted surface water outfall within the HUC-12 subwatershed.

Figure 2-1 Watershed Upstream of Cross Plains WWTF Outall



3. WATER QUALITY TRADING BACKGROUND

This chapter provides background on WQT, including calculation of the target number of WQT credits, pollution reduction activities that can result in WQT credits, trade ratios, and a description of additional environmental benefits of WQT. Subsequent chapters will describe the Village of Cross Plains' phosphorus WQT strategy.

Wisconsin Statutes Section 283.84 and Chapter NR 217 of the Wisconsin Administrative Code allows for alternative compliance through two watershed-based compliance alternatives – WQT and watershed adaptive management (WAM). Both alternatives involve working outside of the service boundaries of the WWTF (and potentially the municipal limits) to reduce phosphorus discharges to the receiving water, allowing for an increase in the mass of phosphorus discharged.

Water quality trading credits must be generated before they can be used to offset a permit limit. In other words, pollution reduction practices must be established and effective before a reduced permit limit takes effect.

3.1 Calculation of Target Water Quality Trading Credits

The target amount of WQT credits can be calculated by comparing the amount of phosphorus discharged by the WWTF to the amount allowed by the WQBEL.

A reduction in WWTF effluent concentrations through additional phosphorus treatment could significantly reduce the amount of WQT credits required. However, the cost of additional phosphorus removal at the WWTF would need to be balanced against the cost of WQT. Once WQT has been selected as the phosphorus compliance alternative, a municipality generally commits itself to achieving the necessary reductions primarily through WQT, but additional phosphorus treatment can be used as necessary if a sufficient number of WQT credits cannot be obtained.

3.2 Pollution Reduction Activities to Generate Trading Credits

Water quality trades can occur on either a point-to-point or nonpoint-to-point basis, as described below.

3.2.1 Point-to-Point Source Water Quality Trading

Point-to-point water quality trading involves trading credits with other point sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative. The point source with whom trading is to occur must have excess water quality credits to trade.

3.2.2 Nonpoint-to-Point Source Water Quality Trading

Nonpoint-to-point water quality trading involves trading credits with nonpoint sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative.

Nonpoint source management practices that can generate trading water quality credits include agricultural practices, urban practices, and lake/reservoir dredging or wetland restoration. Agricultural practices include whole field management / nutrient

management planning, planting of companion crops, changes in tilling options, buffers strips and conservation easements, barnyard improvements, and streambank stabilization. Urban practices include stormwater infiltration structures, sedimentation devices, and detention ponds. Dredging is intended to remove in-situ sediment and nutrients to the original or native soil layer and may be done in concert with water quality treatment (e.g., use of alum as a coagulant) and restoration of lake/reservoir aquatic habitat or installation of streambank buffer strips.

The credits generated by the practice are determined by using modeling to predict the difference in phosphorus load between the improved condition and the baseline prior to improvements.

3.3 Trade Ratios

Water quality trading has a higher level of uncertainty associated with it as compared to treatment-based compliance alternatives due to the need for a large number of outside partnerships with trading partners, particularly non-point source contributors. Obtaining the required reductions/credits for WQT generally requires partnering with several landowners in the watershed and a significant effort by municipalities to identify practices, broker agreements, negotiate cost sharing, inspect and verify implementation, and prepare annual reports to the Wisconsin DNR. A municipality pursuing WQT as a phosphorus compliance alternative would be ultimately responsible for obtaining the required credits and must devote the necessary staff and resources required to support these efforts and to meet the timeline required for permit compliance.

Given inherent uncertainties with WQT, trade ratios must be applied to provide to each WQT project to provide certainty that water quality is actually being improved. A trade ratio is like a multiplier, such that a trade ratio of 3:1 means three pounds of pollution reduction is needed to take one pound of WQT credit.

Trade ratios can vary between 1 and 5 (or higher) depending upon the type of practice installed, location within the watershed, and type of trade being performed. Point-to-point trades generally have the lowest trade ratios (a minimum of 1.1) while nonpoint-to-point trades have higher trade ratios (1.2 to 5). Further, trade ratios are most favorable for phosphorus credits generated upstream of the WWTF discharge and within the same HUC-12 subwatershed, with pollution reduction practices that have a high probability of success.

Trade ratios are calculated for each WQT project, and are based on five factors: delivery, downstream, equivalence, uncertainty, and habitat adjustment. The trade ratio for a particular WQT project is calculated by adding the delivery, downstream, equivalence and uncertainty factors, while subtracting the habitat adjustment factor.

3.3.1 Delivery Factor

A delivery factor is required if trading partners are located in different HUC-12 subwatersheds to account for the fate and transport of the traded pollutant in the surface water. The delivery factor would be zero for trades within the same HUC-12 subwatershed, except if there is a lake or reservoir between the credit generator and user. If a delivery factor is necessary, it would be calculated during the Total Maximum Daily Load (TMDL) development process or using the computer model known as SPARROW (Spatially Referenced Regressions On Watershed Attributes).

A TMDL is in essence a pollution "budget" for a water body or watershed that establishes reductions needed from each pollutant source to meet water quality goals. Information on Wisconsin's TMDL development process is available online at https://dnr.wi.gov/topic/TMDLs/.

SPARROW is a USGS model that relates in-stream water quality measurements to spatially referenced characteristics of watersheds, including contaminant sources and factors influencing terrestrial and aquatic transport. SPARROW empirically estimates the origin and fate of contaminants in river networks and quantifies uncertainties in model predictions. Additional information concerning SPARROW is available online at http://water.usgs.gov/nawqa/sparrow/ and the Great Lakes, Ohio, Upper Mississippi, Red River Basins (MRB3) SPARROW Mapper is accessible online at https://wim.usgs.gov/sparrowmrb3/sparrowmrb3mapper.html# The output from SPARROW is the SPARROW number. A delivery factor can be calculated using the following formula: (Delivery Factor) = [1 / (SPARROW #)] - 1

3.3.2 Downstream Factor

A downstream factor is necessary if the credit generator is downstream of the credit user. The downstream factor is a function of the difference between the average annual load discharged by the credit user to the overall load at the credit user's point of discharge, and ranges from 0.1 to 0.8. If the credit generator is upstream of the credit user, then the downstream factor is zero.

3.3.3 Equivalence Factor

An equivalence factor is not needed (or zero) for phosphorus water quality trades.

3.3.4 Uncertainty Factor

An uncertainty factor accounts for uncertainties associated with nonpoint source trades that originate from climatic variability, potential inaccuracies in field testing or modeling of the amount of pollutant controlled by a management practice, and the reliability of the management practice to perform. A list of example uncertainty factors is shown in Table 3-1.

The uncertainty factor applicable for each management practice may vary depending on how it is implemented. A more descriptive table of uncertainty factors is provided in DNR's "A Water Quality Trading How To Manual", available online at https://dnr.wi.gov/topic/SurfaceWater/tools.html

Table 3-1
Example Uncertainty Factors

Pollution Reduction Activities	Uncertainty Factor
Agricultural Management Practices	
Whole Field Management	1
Companion Crops	1
Conservation Easement	1
Nutrient Management	2 - 3
Production Area Diversion or Roof Runoff Structure	2
Vegetated Treatment System or Constructed Wetland	4
Sediment Control Basin	2
Streambank Stabilization & Shoreline Protection	2 - 3
Dredging, Lake Treatment and Wetland Restoration	
Dredging Lakes or Reservoirs	2 - 3
Dredging Rivers or Streams	1 - 3
Wetland Restoration	1
Urban Practices	
Infiltration, Stormwater Sedimentation Devices, Detention Ponds	2

3.3.5 Habitat Adjustment Factor

A habitat adjustment factor is only used for aquatic habitat restoration efforts that meet applicable DNR and NRCS technical standards. If no aquatic habitat restoration is done as part of a trade, this factor is zero.

3.4 Environmental Benefits

Water quality trading offers greater environmental benefit through nonpoint source reductions as compared to additional wastewater treatment. Water quality trading results in greater theoretical reduction of phosphorus loadings within the watershed, and therefore, greater potential environmental benefit. In addition, nonpoint source phosphorus reduction activities have the potential to improve the efficiency of the agricultural practices within the watershed including reducing fertilizer application rates and energy required to create, transport, and apply the fertilizer.

4. TARGET PHOSPHORUS WATER QUALITY TRADING CREDITS

The amount of phosphorus WQT credits required can be calculated by comparing the amount of phosphorus discharged by a WWTF to the amount allowed by the WQBEL.

4.1 Cross Plains WWTF's Current Phosphorus Effluent Discharge

Table 4-1 tabulates the updated monthly average effluent flowrate from the Cross Plains WWTF for January 2020 to December 2024.

Table 4-1
Monthly Average Effluent Flowrate (MGD)

Month	Year				
	2020	2021	2022	2023	2024
January	0.43	0.35	0.33	0.30	0.30
February	0.37	0.33	0.32	0.31	0.32
March	0.47	0.36	0.34	0.35	0.30
April	0.43	0.35	0.33	0.45	0.40
May	0.46	0.34	0.27	0.41	0.41
June	0.49	0.33	0.27	0.36	0.61
July	0.59	0.34	0.28	0.41	0.85
August	0.43	0.36	0.29	0.42	0.68
September	0.41	0.33	0.30	0.37	0.57
October	0.43	0.35	0.27	0.37	0.50
November	0.43	0.34	0.29	0.34	0.59
December	0.37	0.34	0.30	0.32	0.47
Annual Average	**0.44**	**0.34**	**0.30**	**0.37**	**0.50**
Max Month	0.59	0.36	0.34	0.45	0.85
Min Month	0.37	0.33	0.27	0.30	0.30

Table 4-2 tabulates the updated monthly average phosphorus effluent concentrations from the Cross Plains WWTF for January 2020 to December 2024.

Table 4-2
Monthly Average Effluent Phosphorus Concentration (mg/L)

Month	Year				
	2020	2021	2022	2023	2024
January	0.82	0.44	0.17	0.59	0.17
February	0.52	0.35	0.15	0.55	0.19
March	0.24	0.53	0.22	0.65	0.22
April	0.34	0.35	0.18	0.70	0.22
May	0.29	0.31	0.10	0.64	0.16
June	0.25	0.47	0.15	00.42	0.25
July	0.28	0.50	0.56	0.31	0.25
August	0.18	0.22	0.24	0.28	0.26
September	0.17	0.13	0.22	0.20	0.32
October	0.22	0.10	0.38	0.22	0.25
November	0.18	0.09	0.37	0.196	0.39
December	0.22	0.15	0.41	0.15	0.22
Annual Average	**0.31**	**0.31**	**0.25**	**0.41**	**0.24**
Max	0.82	0.53	0.56	0.70	0.39
Min	0.17	0.09	0.10	0.15	0.16

The Cross Plains WWTF discharged an average of 0.30 mg/L of Phosphorus over the period of January 2020 to December 2024. Typical effluent phosphorus concentrations are or less on average, which indicates the plant's biological nutrient removal system is operating efficiently.

Table 4-3 tabulates the updated monthly average phosphorus loading from the Cross Plains WWTF for January 2020 to September 2024.

Table 4-3
Monthly Average Effluent Phosphorus Loading (ppd)

Month	Year				
	2020	2021	2022	2023	2024
January	1.78	0.81	0.31	1.02	0.30
February	1.01	0.65	0.28	0.98	0.33
March	0.58	1.05	0.41	1.27	0.39
April	.075	0.66	0.31	1.66	0.49
May	0.67	0.57	0.15	1.43	0.35
June	0.65	0.83	0.24	0.85	0.72
July	0.83	0.94	0.89	0.65	1.01
August	0.40	0.42	0.39	0.63	0.88
September	036	0.24	0.38	0.40	0.91
October	0.48	0.19	0.60	0.45	0.67
November	0.39	0.16	0.61	0.35	1.15
December	0.45	0.27	0.43	0.27	0.54
Annual Average	**0.69**	**0.57**	**0.41**	**0.83**	**0.64**
Max	1.78	1.05	0.86	1.66	1.15
Min	0.36	0.16	0.15	0.27	0.30

The Cross Plains WWTF discharged an average of 0.64 pounds per day of phosphorus over the period of January 2020 to September 2024.

4.2 Amount of Phosphorus Discharge Allowed by WQBEL

Using sampling data collected from Black Earth Creek between May to October in both 2016 and 2017, the DNR calculated an ambient background concentration of 0.042 mg/L using procedures specified in Section NR 217.13(2)(d), Wis. Adm. Code. Given this background concentration, the DNR calculated a future phosphorus WQBEL for the Cross Plains WWTF of 0.31 mg/L as a monthly average concentration and 1.5 lbs./day as a monthly average mass limit. The assumptions used when calculating the limit were: 7-Q2 of 7.0 cfs, design flow of 0.593 MGD, and a phosphorus criterion of 0.075 mg/L for Black Earth Creek. Appendix D contains a map of the sampling location, the phosphorus data, and an e-mail from Ms. Sara Luck, Wastewater Engineer, DNR describing the WQBEL calculation.

Therefore, 0.31 mg/L will be used as the future phosphorus WQBEL for the Cross Plains WWTF.

4.3 Calculation of Target Phosphorus Water Quality Trading Credits

In order to calculate the target of phosphorus WQT credits, the monthly average effluent flowrate and phosphorus concentrations for the period of January 2020 to December 2024 were used to calculate the monthly amount of phosphorus above the future WQBEL of 0.31 mg/L discharged by the Cross Plains WWTF. Then, each month's total was summed up to provide an annual target of phosphorus WQT credits.

Table 4-4 shows the monthly phosphorus effluent loading above the future WQBEL of 0.31 mg/L from the Cross Plains WWTF, along with the annual total. The highest annual

total occurred in 2015 when a total of 105.4 pounds of phosphorus at concentrations above the future WQBEL were discharged. This number (105.4 pounds/year) shall be used as the target for phosphorus WQT credits each year during the Cross Plains WWTF's upcoming permit term.

Table 4-4
Phosphorus Effluent Loading Above Future WQBEL

Year	Month (lbs./month)												Total (lbs. / yr)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2010	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	3.3	14.9	14.1	26.2	0	0	0	0	0	0	0	58.5
2012	0	0	53.0	0	0	0	0	0	0	0	0	0	53.0
2013	0.4	2.0	21.3	13.3	0	0	0	37.3	15.7	0	0	0	90.4
2014	0	0	0	5.2	0	0	0	0	0	0	0	0	5.2
2015	15.0	3.6	0	81.6	1.6	3.6	0	0	0	0	0	0	105.4
2016	0	14.2	0.5	0	0	0	0	0	0	0	0	2.7	17.4
2017	35.3	58.5	0	0	0	0	0	0	0	0	0	9.6	103.4
2018	0.4	20.3	0	0	10.0	0	0	29.2	6.4	0	0	0	66.3
2019	11.6	14.1	12.8	0	0	0	0	0	0				38.5

Note: Data analyzed for the period January 2010 through September 2019 inclusive

4.4 Additional Phosphorus Treatment If Required

A reduction in effluent concentrations through additional phosphorus treatment could significantly reduce the amount of WQT credits required. However, the cost of additional phosphorus treatment needs to be balanced against the cost for WQT trading.

The most likely form of additional phosphorus treatment at the Cross Plains WWTF is the addition of PRCs through its existing chemical feed system. Considerations of phosphorus chemical feed treatment at the Cross Plains WWTF are shown in Table 4-5.

Table 4-5
Considerations with Phosphorus Chemical Feed Treatment

Advantages	Disadvantages
Ensures Permit Compliance	New Chemical Feed Pumps Required
Flexible Operation	High Ongoing Cost for PRCs
High Reliability	Requires Routine O&M Cost/Time
Compatible with Biological Phosphorus Removal	Higher Cost than WQT

If the Village of Cross Plains is unable to obtain sufficient phosphorus WQT credits, or if more of a reserve is desired, the Village's intent is to update the existing chemical feed system at the Cross Plains WWTF with new pumps so operators can add PRCs on an intermittent basis to eliminate phosphorus spikes in the effluent. As of 2024, this has occurred, so the Village is able to dose PRCs as necessary to maintain compliance.

4.5 Target Phosphorus WQT Credits with Safety Factor and Credit Usage

The Village of Cross Plains desires to have a safety factor of at least 15% of its phosphorus WQT credit target in the event that the trades do not generate sufficient credits. With a phosphorus WQT credit target of 105.4 pounds per year, a 15% safety

factor would mean the Village needs at least 121.2 pounds per year of credits. The Annual WQT Reports can be found in Appendix A.

Current credit usage can be found in Table 4-6. The number of credits used during the permit term fell below the number of credits available. It is projected that the number of credits available will be sufficient enough to maintain compliance during the next permit term.

Table 4-6
WQT Credit Usage for First WQT Permit Term

2024 WQT Credits Used	
Month	Credits (lbs./month)
January	0.0
February	0.0
March	0.0
April	0.0
May	0.0
June	0.0
July	**8.161**
August	**0.106**
September	**0.543**
October	0.0
November	**12.381**
December	0.0
Sum	21.19
Remaining WQT Credits	101.56

5. WATER QUALITY TRADES

The Village of Cross Plains has pursued one WQT for phosphorus, as described below.

5.1 Barnyard Area of Farm at Landowner A Property

The WQT is with the private landowner of a farm north of Cross Plains referred to throughout this plan as Landowner A. The name and address of the property owned by Landowner A is not included within this plan for privacy reasons.

The farm is located upstream of the Cross Plains WWTF in a different HUC-12 subwatershed. The WWTF is located in HUC-12 subwatershed 070700050502, while the farm is located in HUC-12 subwatershed 070700050501. Both the WWTF and the farm are located within the same HUC-10 watershed 0707000505. Maps showing the location of the farm and land use data are provided in Appendix E.

The property currently consists of an active farm consisting of a barnyard, two feed storage areas, and a pasture. Runoff from the farm flows into Brewery Creek before entering Black Earth Creek. Aerial photographs of the farm owned by Landowner A and surrounding areas are in Appendix F.

Phosphorus is believed to be currently discharged from the barnyard, the feed storage areas, and two erosional gullies on the property. The Dane County Land & Water Resources Department performed a site visit on April 10, 2019 and subsequently calculated the current phosphorus discharge from the property as well as the phosphorus credits if recommended conservation practices were adopted. The memorandum from Dane County, dated April 18, 2019, with their calculations is provided in Appendix G. Note that the name of Landowner A has been redacted from this document for privacy reasons.

Phosphorus credits are only proposed for the barnyard. No phosphorus credits are proposed for either the feed storage area or the gullies due to the property owners' preference to continue existing land use practices in these areas.

The barnyard consists of four concrete lots that hold a total of 118 cattle. The barnyard consists of four lots, denoted Lot #1 through Lot #4. Lot #1 is 470 square feet in size and currently holds twenty 800-pound animals. Lot #2 is 550 square feet in size and currently holds eighteen 500-pound animals. Lot #3 is 2,850 square feet in size and currently holds ten 1,400-pound animals. Lot #4 is 14,180 square feet in size and currently holds eighty-five 1,400-pound animals.

Photographs of the barnyard area are provided in Appendix H. Additional photographs are provided in the Dane County memorandum provided in Appendix G.

BARNY is a computer model that is used to evaluate the discharge of phosphorus from concentrated livestock areas in Wisconsin. BARNY is a Wisconsin adapted version of the USDA Agricultural Research Service's feedlot runoff model and is not an acronym. BARNY was used to estimate the phosphorus discharge from the barnyard under current conditions as well as after all animals have been removed except for five.

Lot #1 has an estimated phosphorus discharge to be 2.7 pounds per year. Lot #2 had an estimated phosphorus discharge of 6.6 pounds per year. Lot #3 has an estimated phosphorus discharge of 28.3 pounds per year. Lot #4 has an estimated phosphorus discharge of 133.0 pounds per year. The total current estimated phosphorus discharge from the barnyard is 170.6 pounds per year.

The proposed WQT involves removing all but five cattle from the barnyard, with the remaining cattle only permitted on Lot #3. This will result in a reduction of 147.3 pounds per year of phosphorus per year being discharged downstream of the barnyard area.

Table 5-1 summarizes the calculation of the trade ratio for the WQT.

Table 5-1
Calculation of Trade Ratio for Water Quality Trade

Delivery Factor	Downstream Factor	Equivalence Factor	Uncertainty Factor	Habitat Factor	Sum of Factors	**Trade Ratio**
0.13	0	0	1.0	0	1.18	1.2

Using the SPARROW computer model, the fraction of load delivered to downstream has changed and is currently 0.8875 from a previous 0.8482. Appendix E contains updated maps depicting the updated SPARROW catchments associated with the HUC-10 watershed number 0707000505 that contains the farm of Landowner A. Using the current SPARROW fraction value of 0.88775 results in a calculated delivery factor of 0.13.

The downstream factor for the proposed WQT is zero because the barnyard is located upstream of the Cross Plains WWTF.

The equivalence factor is zero because no equivalence factor is used when trading phosphorus.

The uncertainty factor for removal of the cattle from the barnyard is (1) because of the low risk of phosphorus loadings being generated by a concrete barnyard with cattle removed and the lot cleaned and maintained in a cleaned state. Contracts have been put in place to give the Village the legal authority to require this. Although the practice does not explicitly fall into a category listed in Table 3-1, the cleaned concrete lots does not have the potential to generate any phosphorus loadings. As a part of both the Water Quality Trading Agreement and Water Quality Easement with Landowner A, livestock are to be removed from the property and the concrete lots cleaned by December 31st, 2019. Two specific restrictions are set forth in the easement signed by Landowner A (the Grantor).

1. For a period of 30 years from the date of this Easement, Grantor shall have no milking cows on the Premises and shall have no more than 5 beef cattle or other livestock on the Premises at any given time.
2. The removal of milking cows from the Premises and the subsequent cleaning of the concrete barnyard on the Premises shall occur no later than December 31, 2019. The concrete barnyard shall be maintained in clean condition during the duration of this Easement.

The conditions of the contractual agreements with Landowner A are such that no loading shall be generated from the concrete lots following removal and cleaning, which

occurred in December of 2019. The Village of Cross Plains has also, through the contractual agreements, received the right to enter the Premises to monitor and enforce activity inconsistent with the terms of the Agreement and Easement. Beyond the extents of the existing concrete lots, the site is drained by two gullies. Identified in Dane County's memorandum, located in Appendix G, it is noted that gully #2 is downstream of the barnyard. Runoff travels across approximately 140' of the property before reaching the gully. At the edge of the concrete lots, the continued practice of seeding and maintaining as lawn will be utilized, such that gully erosion is not occurring at the barnyard itself. Additionally, Appendix I contains an e-mail from Amy Garbe, Wastewater Engineer with the DNR, addressing the fate of the livestock and evaluation of the uncertainty factor to be utilized.

The habitat adjustment factor is zero because no habitat will be added as part of the WQT.

The trade ratio determined by summing the delivery, downstream, equivalence, uncertainty, and habitat factors is 1.13. But the lowest trade ratio for a non-point source trade is 1.2, therefore 1.2 is used as the trade ratio.

Table 5-2 summarizes the proposed water quality trade, including a phosphorus WQT credit of 122.75 pounds per year. The WQT produces phosphorus credits in excess of both the 105.4 pounds per year target and 121.2 pounds per year with safety factor.

Table 5-2
Summary of Proposed Water Quality Trade

Location	Calculated Reduction in Phosphorus Discharge	Trade Ratio	Phosphorus WQT Credit
Barnyard Area	147.3 pounds per year	1.2	122.75 lbs./year
Total Phosphorus Trading Credits			122.75 lbs./year

A Water Quality Easement has been established between the Village of Cross Plains and Landowner A. This legal document has been signed by both property owners and representatives of the Village of Plains, notarized by a Notary Public, and recorded by the Dane County Register of Deeds. The Water Quality Easement restricts the property owners from having more than five beef cattle or other livestock on the property for a period of thirty years. It also gives the Village of Cross Plains the right to prevent inconsistent uses, the right to enter the property to monitor or to enforce the terms of the easement, and the right to prevent and correct violations of the provisions of the Easement.

Appendix J contains a certification statement of the existence of the Water Quality Trading Agreement and Water Quality Easement between the Village of Cross Plains and the credit generator, Landowner A.

Operations and maintenance for this WQT management practice consists of enforcement of the Water Quality Easement. The Village of Cross Plains will dedicate sufficient resources to ensure compliance with the Water Quality Trading Agreement.

Appendix K contains a signed DNR Form 3400-207 (Water Quality Practice Registration) for the WQT.

5.2 Future Water Quality Trades

The Village of Cross Plains will pursue additional WQT(s) in the future if needed to meet regulatory requirements.

6. IMPLEMENTATION SCHEDULE & MILESTONES

6.1 Implementation Timeline

The proposed implementation timeline for this phosphorus WQT plan is as follows:

Preliminary Compliance Alternatives Plan Submitted	November 28, 2018
Submit WQT Notice of Intent to DNR	September 30, 2019
Submit Draft WQT Plan to DNR	September 30, 2019
Submit Management Practice Registration Form to DNR	September 30, 2019
Implement WQT Management Practice	September 30, 2019
Submit Final WQT Plan to DNR	April 2020
Permit and WQT Plan Public Comment Period	August 2020
Cross Plains WWTF WPDES Permit Expires	September 30, 2020

6.2 Water Quality Trade Practice Installation and Registration

A signed DNR Form 3400-207 (WQT Management Practice Registration) form for the proposed water quality trade with Landowner A is provided in Appendix K.

The Village of Cross Plains will submit additional forms to the DNR for each non-point source WQT to certify that the selected pollution reduction practices have been successfully installed.

The purpose of the WQT management practice registration is to ratify to DNR that a management practice identified in the plan has been properly installed and is effective. This information is expected to be used by the DNR to track implementation progress, verify compliance, and perform audits, as necessary.

Management practice registration forms will not be submitted for point-to-point source trades. Any point-to-point source water quality trade will be demonstrated via effluent monitoring and will have documentation and effective date requirements specified in the WPDES permits.

6.3 Tracking, Verification, and Inspection

The Dane County Land & Water Resource Department, acting in partnership with and on behalf of Village of Cross Plains, will verify the performance of its WQT at the barnyard area of Landowner A by performing regular unannounced site inspections to ensure the terms of the Water Quality Easement are being complied with. The Village will take necessary action in the event that it is notified of any non-compliance by Landowner A. In addition, the Village of Cross Plains will make its personnel available to assist the DNR with any inspections it chooses to perform of the WQT location.

The Annual Inspection Reports associated with this WQT can be found in Appendix A.

6.4 Annual Water Quality Trade Report

The Village of Cross Plains will submit an annual report to the DNR for each of its water quality trades. The purpose of the annual report is to inform the DNR of the status of

management practices, provide the DNR with an update of the trading project overall, and submit any needed changes to the plan to DNR. The annual report will include verification that site inspections occurred, including photographs, a brief summary of site inspection findings, any applicable notices of termination or practice registration, the amount of credit used each month over the calendar year; and other requirements as stated in the WPDES permit. Year one can be found in Appendix A

6.5 Notification of Termination

If the Water Quality Easement or this WQT Plan needs to be modified or terminated during the permit term, the Village of Cross Plains will submit DNR Form 3400-209 (Notice of Water Trade Agreement Termination) to the DNR. If the Water Quality Easement is modified or terminated, the phosphorus WQT credits it generates will change accordingly and may result in non-compliance with the Village of Cross Plains WPDES permit. The information on the notice of termination form will be used by the DNR 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.

An unsigned version of the notice of termination form is provided in Appendix L. If this form is to be used, details concerning the nature of the termination will need to be added and the form signed by the Village's authorized representative.

Appendix A

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
South Central Region Headquarters
3911 Fish Hatchery Road
Fitchburg, WI 53711-5397

Scott Walker, Governor
Cathy Stepp, Secretary
Mark Aquino, Regional Director
Telephone (608) 275-3266
FAX (608) 275-3338
TDD (608) 275-3231

Matt Schuenke, Village Administrator
VILLAGE OF CROSS PLAINS
2417 Brewery Rd
PO Box 97
Cross Plains, WI 53528-0097

SUBJECT: WPDES Permit Reissuance No. WI-0020788-09-0
Cross Plains Wastewater Treatment Facility, 1000 MAIN STREET (USH 14), CROSS PLAINS, WISCONSIN

Dear Permittee:

Your Wisconsin Pollutant Discharge Elimination System (WPDES) Permit is enclosed. The conditions of the enclosed permit reissuance were determined using the permit application, information from your WPDES permit file, other information available to the Department, comments received during the public notice period, and applicable Wisconsin Administrative Codes. All discharges from this facility and actions or reports relating thereto shall be in accordance with the terms and conditions of the enclosed permit.

This enclosed permit requires you to submit monitoring results to the Department on a periodic basis. Monitoring forms, which must be submitted electronically, are available on the Department's web page. Go to the DNR Switchboard page at http://dnr.wi.gov/topic/switchboard/ to log in and access your monitoring forms. For your convenience, there is a 'Summary of Reports Due' at the end of the enclosed permit that shows a synopsis of the required reports and monitoring forms.

The WPDES permit program has been approved by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 402(b) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1342 (b)). The terms and conditions of the enclosed permit are accordingly subject to enforcement under ss. 283.89 and 283.91, Stats., and Section 309 of the Federal Act (33 U.S.C. Section 1319).

The Department has the authority under chs. 160 and 283, Stats., to establish effluent limitations, monitoring requirements, and other permit conditions for discharges to groundwater and surface waters of the State. The Department also has the authority to issue, reissue, modify, suspend, or revoke WPDES permits under ch. 283, Stats.

The enclosed permit contains water quality-based effluent limitations that are necessary to ensure the water quality standards for Black Earth Creek (Black Earth Creek Watershed, LW17 – Lower Wisconsin River Basin) in Dane County (SE ¼ of NE ¼ of Section 4, T7N_R7E) are met. You may apply for a variance from the water quality standard used to derive the limitations pursuant to s. 283.15, Stats., by submitting an application to the Director of the Bureau of Water Quality, P.O. Box 7921, Madison, Wisconsin 53707 within 60 days of the date the permit was issued (see "Date Permit Signed/Issued" after the signature on the front page of the enclosed permit). This statute also allows the permittee to apply for a variance to the water quality standard when applying for reissuance of the permit. Subchapter III of ch. NR 200, Wis. Adm. Code, specifies the procedures that must be followed and the information that must be included when submitting an application for a variance.

If your permit contains a stringent Water Quality Based Effluent Limit for Phosphorus, there is a Compliance Schedule requirement to complete a Phosphorus Operational Evaluation and Optimization Report. To streamline the Report preparation and review process the Department has prepared a Worksheet which should be used to develop the report. The worksheet may be found at : http://dnr.wi.gov/topic/surfacewater/phosphorus.html.

To challenge the reasonableness of or necessity for any term or condition of the enclosed permit, s. 283.63, Stats., and ch. NR 203, Wis. Adm. Code, require that you file a verified petition for review with the Secretary of the Department of Natural Resources within 60 days of the date the permit was issued (see "Date Permit Signed/Issued" after the signature on the front page of the enclosed permit). For permit-related decisions that are not reviewable pursuant to s. 283.63, Stats., it may be possible for permittees or other persons to obtain an administrative review pursuant to s. 227.42, Stats., and s. NR 2.05(5), Wis. Adm. Code, or a judicial review pursuant to s. 227.52, Stats. If you choose to pursue one of these options, you should know that Wisconsin Statutes and Administrative Code establish time periods within which requests to review Department decisions must be filed.

Sincerely,

Tim Ryan
Wastewater Field Supervisor

Dated:_____

cc: Legal Permit File
Cyndi Barr, WT/3
U.S. Fish and Wildlife Service (Electronic Copy via Email)
Amy Garbe

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

NOTICE OF FINAL DETERMINATION TO REISSUE

A WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM (WPDES) PERMIT No. WI-0020788-09-0

Permittee: VILLAGE OF CROSS PLAINS, 2417 Brewery Road, Cross Plains, WI, 53528-0097

Facility Where Discharge Occurs: Cross Plains Wastewater Treatment Facility, 1000 MAIN STREET (USH 14), CROSS PLAINS, WISCONSIN

Receiving Water And Location: Black Earth Creek (Black Earth Creek Watershed, LW17 – Lower Wisconsin River Basin) in Dane County (1000 Main Street (USH 14), Cross Plains WI (SE ¼ of NE ¼ of Section 4, T7N_R7E - Lat: 43.1142/Lon: -89.6638))

Brief Facility Description: Cross Plains operates a wastewater treatment facility (WWTF) that provides secondary treatment and nutrient removal to primarily domestic wastewater. The system provides treatment for a population of approximately 3,700 and some commercial businesses. Treatment units include mechanical influent step screening, selector basins to enhance biological phosphorus removal, two oxidation ditches for activated sludge secondary treatment, final clarification, seasonal ultraviolet disinfection and effluent diffused and cascade aeration. The Cross Plans plant has an annual average design flow of 0.593 MGD and presently treats approximately 0.343 MGD of wastewater annually. Biosolids are aerobically digested and thickened with a gravity belt thickener before being hauled to another facility. The facility does not have 180 days of biosolids storage on-site; however, biosolids are hauled to the Dane-Iowa WWTF for further Class A sludge treatment and eventual land application on Department-approved agricultural fields.

Permit Drafter's Name, Address and Phone: Phillip Spranger, DNR, SCR Headquarters, 3911 Fish Hatchery Rd, , Fitchburg, WI, 53711, (608) 273-5969

Basin Engineer's Name, Address, and Phone: Amy Garbe, 3911 Fish Hatchery Road, Fitchburg, WI 53711, (262) 574-2135

Date Permit Signed/Issued: September 28, 2015
Date of Effectiveness: October 1, 2015
Date of Expiration: September 30, 2020

Following the public notice period the Department has made a final determination to reissue the WPDES permit for the above-named permittee for this existing discharge. The permit application information from the WPDES permit file, comments received on the proposed permit and applicable Wis. Adm. Codes were used as a basis for this final determination.

The Department has the authority to issue, modify, suspend, or revoke WPDES permits and to establish effluent limitations and permit conditions under ch. 283, Stats.

Following is a summary of significant comments and any significant changes which have been made in the terms and conditions set forth in the draft permit:

Comments Received from the Applicant, Individuals or Groups and Any Permit Changes as Applicable
Comments were received by email on September 14, 2015 from Matthew G Schuenke on behalf of the Village of Cross Plains.

Cross Plains Comment #1 – Ammonia limits: In the previous permit, a proposed daily maximum limit of 5.2 mg/L was increased to 16 mg/L due to excessive historical violations of the proposed limit. At that time, weekly and monthly average limit were neither reevaluated nor included; but have since been included in the draft permit. The Village has evaluated effluent ammonia data from 2010 through 2015 and found effluent ammonia exceeded the proposed limits four times and was within 85% of the proposed limits two times. The Village requests an ammonia compliance schedule be included in the permit to allow for additional study of the receiving stream and WWTP operations.

DNR Response #1 – Cross Plains has demonstrated that there is reasonable potential to exceed the weekly and monthly average ammonia limitations. These limitations should have been included in the previous permit once the increase to the daily maximum limit was effective, since the daily maximum limit was no longer the most stringent limit. Based on these points, a compliance schedule for complying with the new weekly and monthly limitations will be granted. The required action items and due dates will be as follows:

4.4 Ammonia Effluent Limits & Facility Modifications

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieve the final weekly average and monthly average ammonia limits.	12/31/2016
Action Plan: Submit an action plan for complying with all applicable effluent ammonia limits.	12/31/2017
Construction Plans: Submit construction plans (if construction is required for complying with effluent ammonia limits) and include plans and specifications with the submittal.	06/30/2018
Initiate Actions: Initiate actions identified in the plan.	12/31/2018
Complete Actions: Complete actions necessary to achieve compliance with effluent ammonia limits.	12/31/2019

In addition to the new ammonia compliance schedule, the following changes have been made to the table notes for ammonia parameters in the surface water monitoring table at subsection 2.2.1 for sample point 001:

For the parameter "Nitrogen, Ammonia (NH_3-N) Total" with the "Daily Max" limit type the following clarifying table note was added: "Ammonia monitoring required 3/week on the permit effective date. Daily maximum limit applies year-round."

For the parameters "Nitrogen, Ammonia (NH3-N) Total" with limit types of "Weekly Avg" and "Monthly Avg" the following text has been added to the end of each existing table note: ", beginning January 1 2020. See ammonia compliance schedule at subsection 4.4."

Cross Plains Comment #2 – Thermal Limits: Weekly average effluent thermal limits have been proposed in the draft permit for the months of August through November. Effluent temperature has been historically monitored and ambient stream temperature has been monitored by USGS and the Village at 5 locations on Black Earth Creek. The Village has evaluated available effluent and stream temperature data from 2010 through 2014. Data collected during this period indicates effluent temperature exceeded proposed limits 38 times. Of those 38 exceedances, the water temperature downstream exceeded the sub lethal water quality criteria only three times. Further, all three exceedances of the sub lethal water quality criteria occurred when an upstream gauge indicated that the upstream water temperature exceeded the sub lethal water quality criteria. Based upon the monitoring data, the Village would like to request that effluent thermal limits be removed from their permit as it does not appear that the WWTP discharge is resulting in an exceedance of the sub lethal water quality criteria within Black Earth Creek.

DNR Response #2 – The Village of Cross Plains has been granted a 4 year compliance schedule to meet final thermal limitations. Per subsection 2.2.1.7 of the proposed permit, the Village may conduct a Dissipative Cooling Demonstration to determine if the effluent thermal load adequately dissipates. Ambient stream temperature can be evaluated as part of a DC study or for potential alternative limits. Since the Village will be performing a mixing zone study during the permit term to assist with compliance with new ammonia limits, the Department will evaluate the ambient stream temperature as part of the mixing zone/DC study within the permit term. Per subsection 2.2.1.7, if reevaluation of the limits determines that temperature limits are no longer needed, the permit will be modified per s. 283. 53, Stats. No changes will be made to the permit based on this comment.

Cross Plains Comment #3 – Thermal Limit Compliance Schedule and Dissipative Cooling Evaluation: In the event that thermal limits remain in the permit, the Village requests a time extension in the compliance schedule which will be needed to adequately perform a Dissipative Cooling Study during the months in which limits apply. The request for the schedule modifications are as follows:

Required Action	Due Date	Revised Due Date
Preliminary Compliance Report	09/30/2016	12/31/2016
Action Plan	09/30/2017	12/31/2017
Construction Plans	03/31/2018	09/30/2018
Initiate Actions	09/30/2018	03/31/2019
Complete Actions	09/30/2019	03/31/2020

DNR Response #3 – Thermal limitations and applicable compliance schedule have been retained in the proposed permit. The action items for Section 4.2 "Temperature Limits Compliance and Dissipative Cooling Evaluation" will be pushed out an additional 3 months to allow for a Dissipative Cooling study to occur in November and have the following dates:

Required Action	Due Date	Revised Due Date
Preliminary Compliance Report	09/30/2016	12/31/2016
Action Plan	09/30/2017	12/31/2017
Construction Plans	03/31/2018	06/30/2018
Initiate Actions	09/30/2018	12/31/2018
Complete Actions	09/30/2019	12/31/2019

In addition, subsection 2.2.1.6 will be updated to reflect the changes to the compliance schedule. The thermal limitations will become effective on January 1, 2020.

The "Temperature Maximum" parameters for August, September, October and November have been removed from the surface water monitoring table at subsection 2.2.1 of the permit and are now listed in a table at subsection 2.2.1.6 of the permit.

Cross Plains Comment #4 – The proposed phosphorus water quality based effluent limitation was calculated based on a conservation of mass approach which requires background phosphorus concentration in Black Earth Creek. In 2014 the Village partnered with USGS to complete a comprehensive monitoring program. USGS sampling and gauging stations were installed at three locations. Automated sampling occurs monthly to gather base flow data and on regular intervals during storm events.

In the WQBEL memo dated May 22, 2105, the background phosphorus concentration in Black Earth Creek is listed as 0.214 mg/L based on data collected between 6/16/14 and 09/22/14. The Village has evaluated this data and feels that the Department has misunderstood the method of sampling. It is the Village's understanding that the "background" phosphorus concentration represents a "base flow" type sample and should not be significantly biased by storm events. The Village feels that background phosphorus concentrations for Black Earth Creek should be calculated based upon base flow sampling only and that flow weighted data from the two upstream sites should be used. The estimated flow weighted background concentration for the two upstream sites using base flow sampling only is 0.045 mg/L using data from June 2014 through October 2014. The Village requests the background phosphorus concentration be reevaluated by the Department.

DNR Response #4 – S. NR 217.13(2)(d), Wis. Adm. Code describes the background concentrations used to determine representative concentrations in a receiving stream. The WisCALM recommends collecting data at a standard increment of time to prevent dataset bias. By taking a 28-day average, this should adjust for certain storm events. Due to the nature of the USGS gauge stations taking multiple samples a day during a storm event, it is emphasizing storm events and skewing the data up. However, just looking at baseflow skews the median down; therefore some of the storm event data will be used to determine the median background phosphorus concentration. After looking at the various gauging stations on Black Earth Creek, it was determined that USGS site number #05406500 is the most representative for determining flow. It is located downstream of the treatment plant outfall, but there are no major tributaries flowing into the system downstream of the plant and the upstream gauging station does not factor in the flow from Brewery Creek.

Evaluating flow data from November 2014 through April 2015, it was determined that flows <60 cfs would be representative of the combined receiving waters. This translated to a flow of 15 cfs for Black Earth Creek when data from USGS site #05406479 is extrapolated. So in addition to the baseflow data set presented in the comments from Cross Plains, additional background concentrations (cells shaded grey) produced at a stream flow of < 15 cfs have been included generating the following table:

Brewery Creek				Black Earth Creek				Combined Upstream		
Date	Base	28-day avg	Flow	Date	Base	28-day avg	Flow	Date	Base	28-day avg
06/16/2014	0.06	0.06	1.6	06/16/2014	0.05	0.05	9.3	06/16/2014	0.0515	0.0515
06/22/2014				06/22/2014	0.14	0.14	15	06/22/2014	0.14*	0.10*
07/21/2014	0.07	0.07	1.2	07/21/2014	0.04	0.09	10	07/21/2014	0.0432	0.0432
08/14/2014	0.07	0.07	1.1	08/14/2014	0.05	0.0766667	8.4	08/14/2014	0.0523	0.0478
08/26/2014				08/26/2014	0.54	0.20	12	08/26/2014	0.54*	0.30*
09/22/2014	0.05	0.05	1.1	09/22/2014	0.02	0.28	10	09/22/2014	0.0230	0.2815
05/14/2015	0.04	0.04	1	05/14/2015	0.06	0.06	7.3	05/14/2015	0.0576	0.0576
05/24/2015	1.07	0.54	2.6	05/24/2015	0.07	0.07	9.35	05/24/2015	0.29	0.17

***- This value is solely based on the in-stream concentration and flow of Black Earth Creek given the absence of data for Brewery Creek. Given that the in-stream concentrations in Brewery Creek are typically higher than the concentrations in Black Earth Creek for both base flow and storm events, this concentration may actually under-estimate the combined TP concentration upstream of the discharge.**

The median value of the revised dataset (combined 28-day average) is 0.0939 mg/L. Based on this, it is appropriate to conclude that the in-stream phosphorus concentration in Black Earth Creek exceeds the phosphorus criteria pursuant to s. 217.13(2)(d), Wis. Adm. Code. No change will be made to the permit based on this comment.

Cross Plains Comment #5 – The Village of Cross Plains hauls thickened sludge to the Dane Iowa Wastewater Treatment Facility in Mazomanie for further treatment and eventual land disposal. Dane Iowa produces a Class A exceptional quality sludge through pasteurization and alkaline stabilization. In similar situations the Department has approved eliminating sludge testing requirements for WWTP's hauling sludge to other permitted facilities as sufficient sampling is performed under the other facility's WPDES permit. Therefore, the Village is requesting that hauled sludge sampling be removed from their permit.

DNR Response #5 –SS. NR 204.06(2)(c)(5) Wis Adm. Code, allows the frequency of monitoring to be reduced after 2 years of sludge monitoring. The Village of Cross Plains has been sampling their sludge consistently in the past and therefore meets the 2 year requirement. Since the Village does not land apply under their own permit and Dane Iowa further treats the sludge to a Class A product, Outfall 002 will be made inactive for contingency use only. The sample point designation for Outfall 002 shall now read:

"This outfall has been included as a contingency plan if Cross Plains needs to land apply under their own permit. If all biosolids are hauled to another treatment plant during a calendar year, no sampling needs to be performed by the facility. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year that the sludge is hauled to another facility. In the event sludge is land applied directly by the permittee instead of hauled to another facility, Aerobically digested, Thickened, Liquid, Class B. Representative sludge samples shall be collected from the discharge of the gravity belt thickener. Sludge samples shall be collected prior to land application and test results shall be reported on Form 3400-49 'Waste Characteristics Report'. The permittee shall contact the DNR Basin Engineer for approval and requirements prior to landspreading."

Nutrient sampling will be added to the Hauled Sludge monitoring table for sample point 002 at subsection 3.2.1 of the permit since nutrient sampling is required if Cross Plains was to land apply under their own permit.

The following additions have been included at the end of section 3 of the permit relating to Land Application Requirements: a table titled "Other Sludge Requirements; and subsections 3.2.1.1 through 3.2.15. These conditions must be met if Cross Plains was to land apply under their own permit.

Comments Received from EPA or Other Government Agencies and Any Permit Changes as Applicable

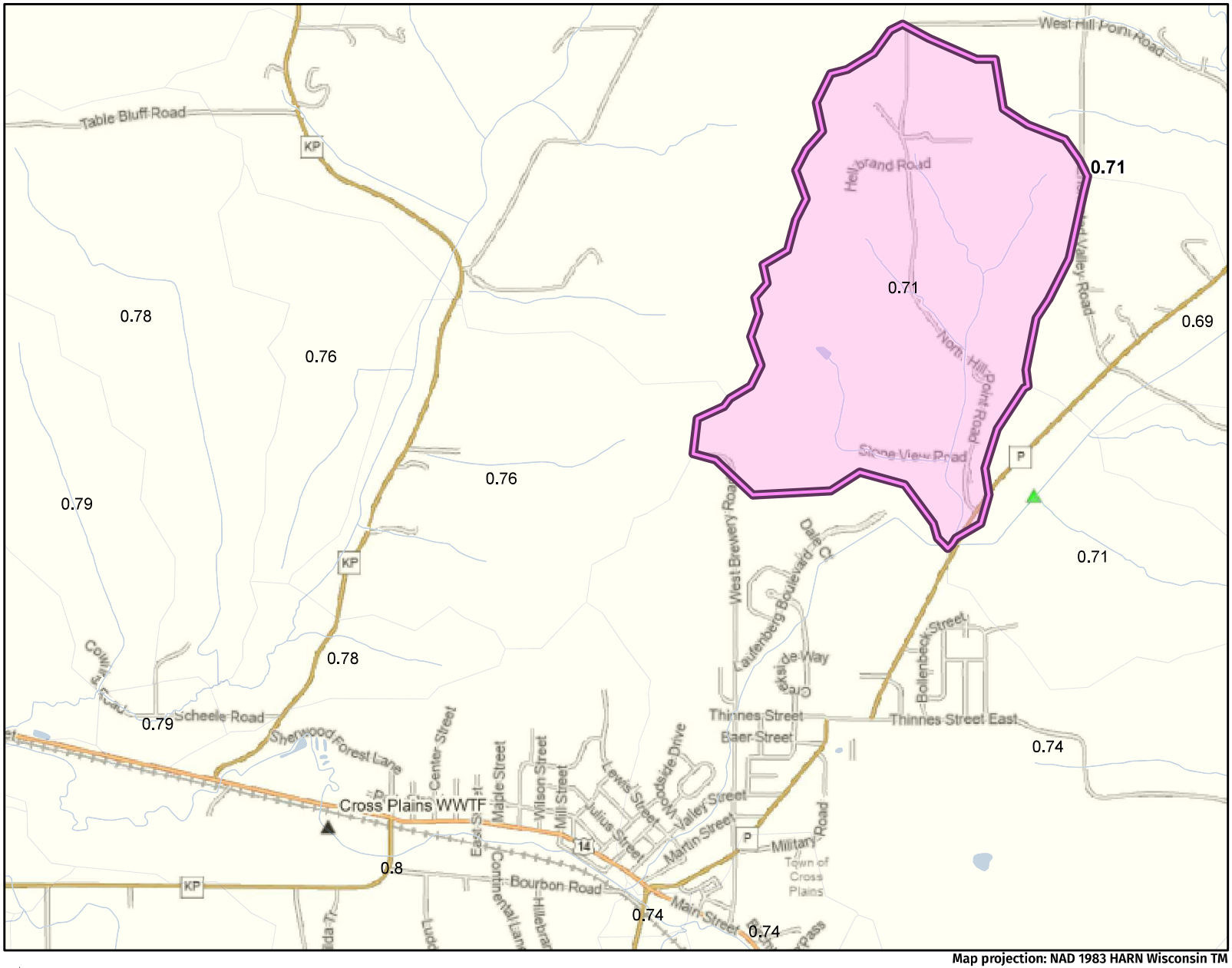
No comments received

As provided by s. 283.63, Stats., and ch. 203, Wis. Adm. Code, persons desiring further adjudicative review of this final determination may request a public adjudicatory hearing. A request shall be made by filing a verified petition for review with the Secretary of the Department of Natural Resources within 60 days of the date the permit was signed (see permit signature date above). Further information regarding the conduct and nature of public adjudicatory hearings may be found by reviewing ch. NR 203, Wis. Adm. Code, s. 283.63 Stats., and other applicable law, including s. 227.42, Stats.

Information on file for this permit action may be inspected and copied at either the above named permit drafter's address or the above named basin engineer's address, Monday through Friday (except holidays), between 9:00 a.m. and 3:30 p.m. Information on this permit action may also be obtained by calling the permit drafter at (608) 273-5969 or by writing to the Department. Reasonable costs (usually 20 cents per page) will be charged for copies of information in the file other than the public notice and fact sheet. Pursuant to the Americans with Disabilities Act, reasonable accommodation, including the provision of informational material in an alternative format, will be made to qualified individuals upon request.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Village of Cross Plains WQT Project SPARROW Value



Legend: (some map layers may not be displayed)

- SPARROW Model Catchment
  - 0.621401 - 0.825600
- Exemption Determinations
- Surface Water Outfalls
- 24K Lakes and Open Water
- 24K Streams and Rivers
- 24K Intermittent Streams
- City or Village
- County Boundaries
- Major Roads
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

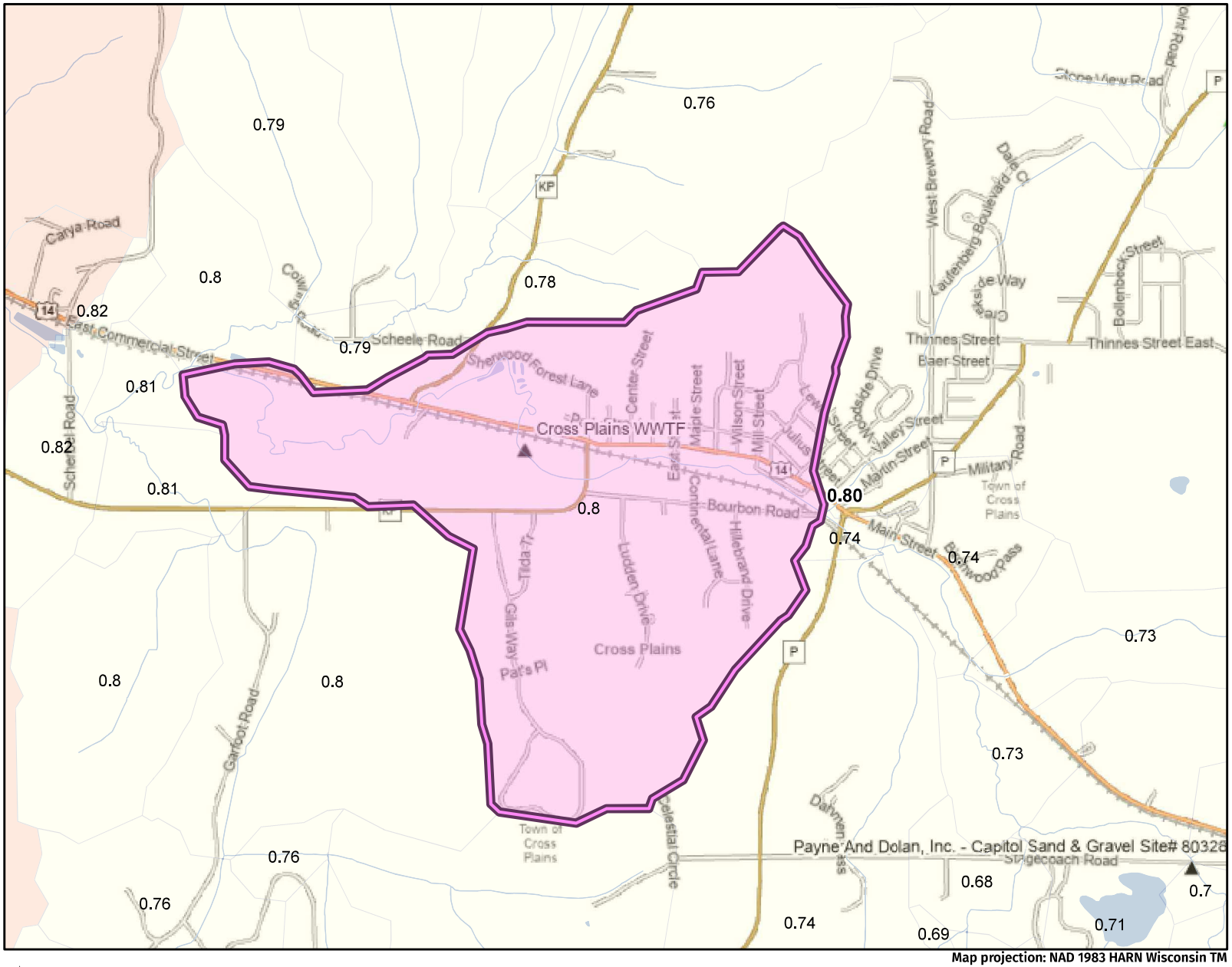
Map: 0 2,000 4,000 Feet
0 600 1,200 Meters

Service Layer Credits:
Permits & Determinations: WI DNR Bureau of Watershed Management, Cities, Roads & Boundaries:

Date Printed: 2/26/2025 3:17 PM

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Village of Cross Plains WWTF SPARROW Value



Legend: (some map layers may not be displayed)

SPARROW Model Catchment
- 0.621401 - 0.825600
- 0.825601 - 0.947100

Exemption Determinations

Surface Water Outfalls

24K Lakes and Open Water

24K Streams and Rivers

24K Intermittent Streams

City or Village

County Boundaries

Major Roads
- US Highway

County and Local Roads
- County HWY
- Local Road

Railroads

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 2,000 4,000 Feet
0 600 1,200 Meters

Service Layer Credits:
Permits & Determinations: WI DNR Bureau of Watershed Management, Cities, Roads & Boundaries:

Date Printed: 2/26/2025 3:15 PM

Village of Cross Plains
Utility Department

P.O. Box 97
Cross Plains, WI 53528

Ted Pritchett
Operator in Charge

PH 608.235.4433
FAX 608.798.0314

Date: February 24, 2025

To: Jordan Main – DNR Basin Engineer

From: Ted Pritchett – Village of Cross Plains

Re: Annual WQT Report #4

This letter should be considered as the submittal for the Annual WQT Report for the Village of Cross Plains.

1. The number of pollutant reduction credits in lbs/month to comply – A total of 21.19 pounds were used to comply in calendar year 2024. A summary of the monthly usage is below:

2024 WQT Credits Used	
Month	Credits (lbs/month)
January	0.0
February	0.0
March	0.0
April	0.0
May	0.0
June	0.0
July	**8.161**
August	**0.106**
September	**0.543**
October	0.0
November	**12.381**
December	0.0
Sum	21.19
Remaining WQT Credits	101.56

2. Identity of the water quality trading Plan – WQT 2020-0006 Landowner A, Barnyard Area.

Village of Cross Plains
Department of Public Facilities

P.O. Box 97
Cross Plains, WI 53528

Jerry Gray
Director of Public Facilities

PH 608.235.1054
FAX 608.798.0314

Date: January 25, 2024

To: Jordan Main – DNR Basin Engineer

From: Jerry Gray – Village of Cross Plains DPF

Re: Annual WQT Report

This letter should be considered as the submittal for the Annual WQT Report for the Village of Cross Plains.

1. The number of pollutant reduction credits in lbs/month to comply – Zero (0)
2. Identity of the water quality trading Plan – WQT 2020-0006 Landowner A, Barnyard Area.
3. Summary of Annual Inspection of non-point source management practices - Inspection preformed on November 2, 2023. Barnyard is clean and empty of livestock. No evidence of presence of livestock within the past year.
4. Noncompliance or failure to implement any terms or conditions of this permit – None found.

If you have any questions regarding the information above please contact me via email or phone at 608-235-1054.

Sincerely,

The Village of Cross Plains

Jerry Gray - DPF

3. Summary of Annual Inspection of non-point source management practices - Inspection preformed on February 20, 2025. Barnyard is clean and empty of livestock. No evidence of presence of livestock within the past year. Fences and containment mechanisms for livestock have been removed. Photos attached.
4. Noncompliance or failure to implement any terms or conditions of this permit – None found.

If you have any questions regarding the information above please contact me via email or phone at 608-235-4433.

Sincerely,

The Village of Cross Plains

Ted Pritchett

Appendix B

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

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Village of Cross Plains	WI- 0020788-09-0	

Facility Address	City	State	ZIP Code
100 Main Street (USH 14)	Cross Plains	WI	53528

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jerry Gray	100 Main Street (USH 14)	Cross Plains	WI	53528

Project Name
Cross Plains WWTP Phosphorus Water Quality Trading Plan

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Black Earth Creek	Total Phosphorus	070700050502

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

Credit Generator Information

Credit generator type (select all that apply):
- ☐ Permitted Discharge (non-MS4/CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant?
- ◉ Yes; HUC 12: 070700050501
- ○ No
- ○ Unsure

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

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

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

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

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

List the practices that will be used to generate credits:

Removal of livestock from barnyard area of privately owned farm.

Method for quantifying credits generated:
- ☐ Monitoring
- ☒ Modeling, Names: BARNY
- ☐ Other: _____

Projected date credits will be available: 10/01/2020

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
Britt Schmitt	9/26/19

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	Date Signed
Jerry Gray VP CP	9/24/19

Appendix C

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

Water Quality Trading Checklist

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Village of Cross Plains	WI- 0020788-09-0	

Facility Address	City	State	ZIP Code
100 Main Street (USH 14)	Cross Plains	WI	53528

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jerry Gray	100 Main Street (USH 14)	Cross Plains	WI	53528

Project Name
Cross Plains WWTP Phosphorus Water Quality Trading Plan Development

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Black Earth Creek	Total Phosphorus	070700050502

Credit Generator Information

Credit generator type (select all that apply):

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

Are any of the credit generators in a different HUC 12 than the applicant?
- ◉ Yes; HUC 12: 070700050501
- ○ No

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

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

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

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

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

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

Does plan have a narrative that describes:			Plan Section
a. Summary of discharge and existing treatment including optimization	◯ Yes	◯ No	
b. Amount of credit being generated	◯ Yes	◯ No	
c. Timeline for credits and agreements	◯ Yes	◯ No	
d. Method for quantifying credits	◯ Yes	◯ No	
e. Tracking and verification procedures	◯ Yes	◯ No	
f. Location of credit generator in proximity to receiving water and credit user	◯ Yes	◯ No	
g. Other: ______________________	◯ Yes	◯ No	

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

Discharge Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
◯ Urban NPS ◉ Agricultural NPS ◯ Other	Livestock Removal	BARNY Computer 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
◯ 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	2.7
b. Management practices used to generate credits	◉ Yes	◯ No	5.1
c. Amount of credit being generated	◉ Yes	◯ No	5.1
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	5.1
e. Location where credits will be generated	◉ Yes	◯ No	5.1
f. Timeline for credits and agreements	◉ Yes	◯ No	5.1
g. Method for quantifying credits	◉ Yes	◯ No	5.1

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	6.3
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	6.3
j. Reporting requirements should the management practice fail	◉ Yes	○ No	6.5
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	5.1
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	5.1
m. Practice registration documents, if available	◉ Yes	○ No	Appendix K
n. History of project site(s)	◉ Yes	○ No	5.1
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
Britt Schmidt	9/26/19

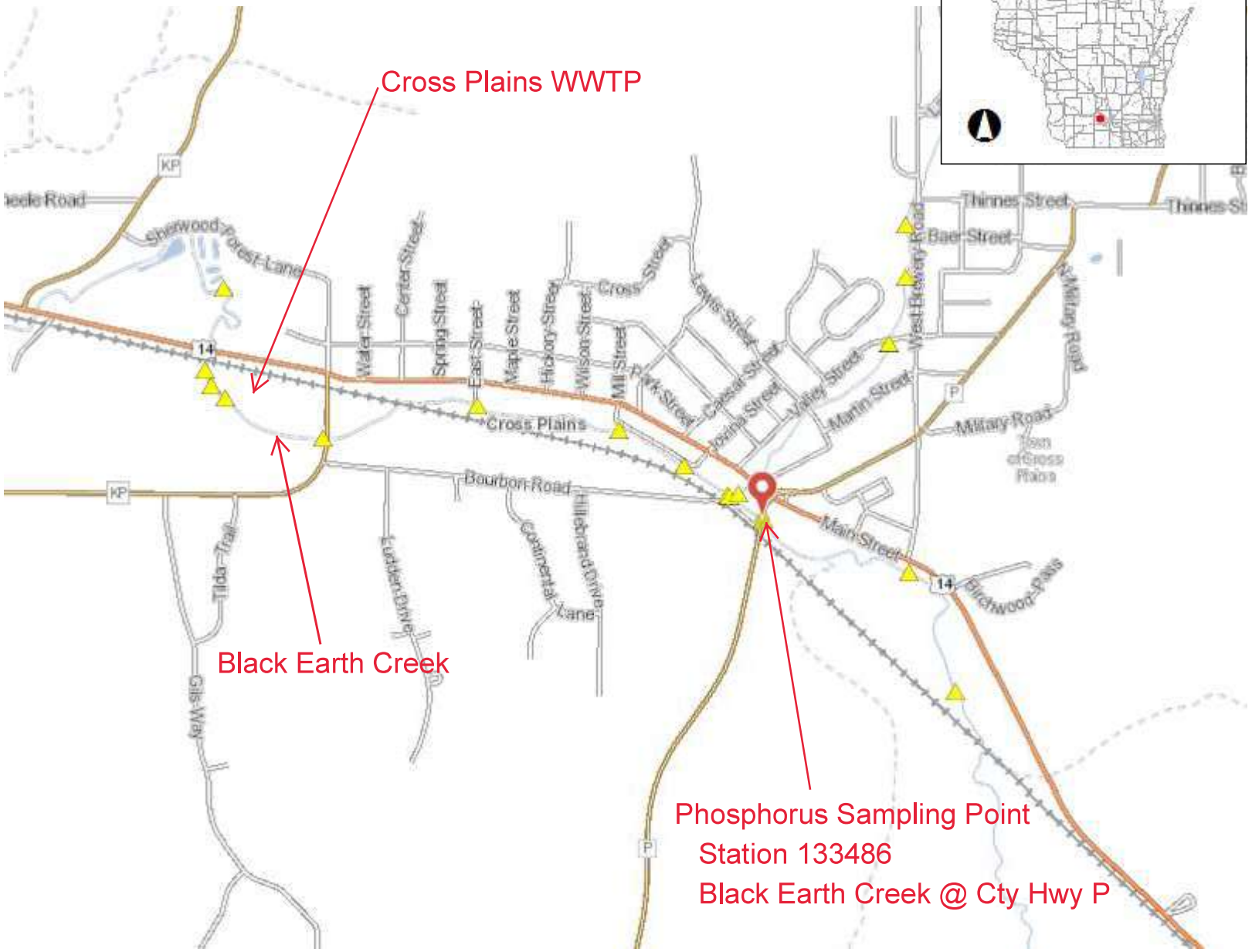
Authorized Representative Signature

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	Date Signed
Jerry Gray VP/CP	9/24/19

Appendix D

Surface Water Data Viewer Map



Legend

- Station Points with Recent Data (10 years)
- 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

0.5 0 0.25 0.5 Miles

NAD_1983_HARN_Wisconsin_TM

1: 15,840

Table: In-Stream Sampling in Black Earth Creek Upstream of Discharge

Month	Total Phosphorus Concentration [mg/L]
May '16	0.027
June '16	0.4
July '16	0.039
August '16	0.05
September '16	0.065
October '16	0.044
May '17	0.04
June '17	0.037
July '17	0.11
August '17	0.037
September '17	0.038
October '17	0.051
MEDIAN	0.042

J:\TCDead\Cross Plains\CP-104-W1 2017 Black Earth Creek\Data\In-Stream Conc\

From:	Evan Chambers
To:	Brett Schmidt
Subject:	FW: Black Earth Creek Study data
Date:	Thursday, September 19, 2019 3:29:18 PM

Evan
Evan D. Chambers, P.E.
echambers@tcengineers.net
Town & Country Engineering, Inc.
2912 Marketplace Drive, Suite 103
Madison, WI 53719
(608) 273-3350

From: Luck, Sarah D - DNR [mailto:Sarah.Luck@wisconsin.gov]
Sent: Thursday, May 9, 2019 4:31 PM
To: Evan Chambers <echambers@tcengineers.net>; Ben Heidemann <ben@tcengineers.net>
Cc: ted@cross-plains.wi.us; Garbe, Amy M - DNR <Amy.Garbe@wisconsin.gov>; Connors, Tanner J - DNR <Tanner.Connors@wisconsin.gov>
Subject: RE: Black Earth Creek Study data

Hi Evan and Ben,

The Department has evaluated the sampling data you submitted for Black Earth Creek, collected between May-October 2016 and 2017, and have calculated the ambient background concentration to be 0.042 mg/L using procedures specified in Section NR 217.13(2)(d), Wis. Adm. Code. Given this background concentration, we anticipate the new phosphorus limits for Cross Plains WWTF will be 0.327 mg/L as a monthly average concentration and 1.6 lbs/day as a monthly average mass limit.

The assumptions used when calculating the limit were: 7-Q_2 of 7.0 cfs, design flow of 0.593 MGD, and a phosphorus criterion of 0.075 mg/L for Black Earth Creek.

Thank you for your patience and quick responses to my questions. If you need anything further from me, please let me know.

Sarah Luck
Phone: (608) 275-3230
Sarah.Luck@Wisconsin.gov

From: Evan Chambers <echambers@tcengineers.net>
Sent: Wednesday, April 3, 2019 9:41 AM
To: Luck, Sarah D - DNR <Sarah.Luck@wisconsin.gov>; Ben Heidemann <ben@tcengineers.net>
Cc: ted@cross-plains.wi.us
Subject: RE: Black Earth Creek Study data

Hi Sarah,

You should be able to download the documents from the link below. Please let me know if there are any issues. Thanks!

https://personal.filesanywhere.com/fs/v.aspx?v=8d726a885d6575af9da6

Evan
Evan D. Chambers, Staff Engineer
echambers@tcengineers.net
Town & Country Engineering, Inc.
2912 Marketplace Drive, Suite 103
Madison, WI 53719
(608) 273-3350 Fax: (608) 273-3391

From: Luck, Sarah D - DNR [mailto:Sarah.Luck@wisconsin.gov]
Sent: Wednesday, April 3, 2019 9:37 AM
To: Evan Chambers <echambers@tcengineers.net>; Ben Heidemann <ben@tcengineers.net>
Cc: ted@cross-plains.wi.us
Subject: Black Earth Creek Study data

Good morning,

I am writing to request the raw data/lab slips from the in-stream sampling study that has been conducted on Black Earth Creek over the past 4+ years on behalf of Cross Plains WWTF. My colleague, Amy Garbe, spoke with the facility last week, and they are interested in having their water quality based effluent limit recalculated using the new background concentration data from this study.

Thanks very much, and please let me know if you have any questions.

Sarah Luck
Water Resources Engineer
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
Phone: (608) 275-3230
Sarah.Luck@Wisconsin.gov

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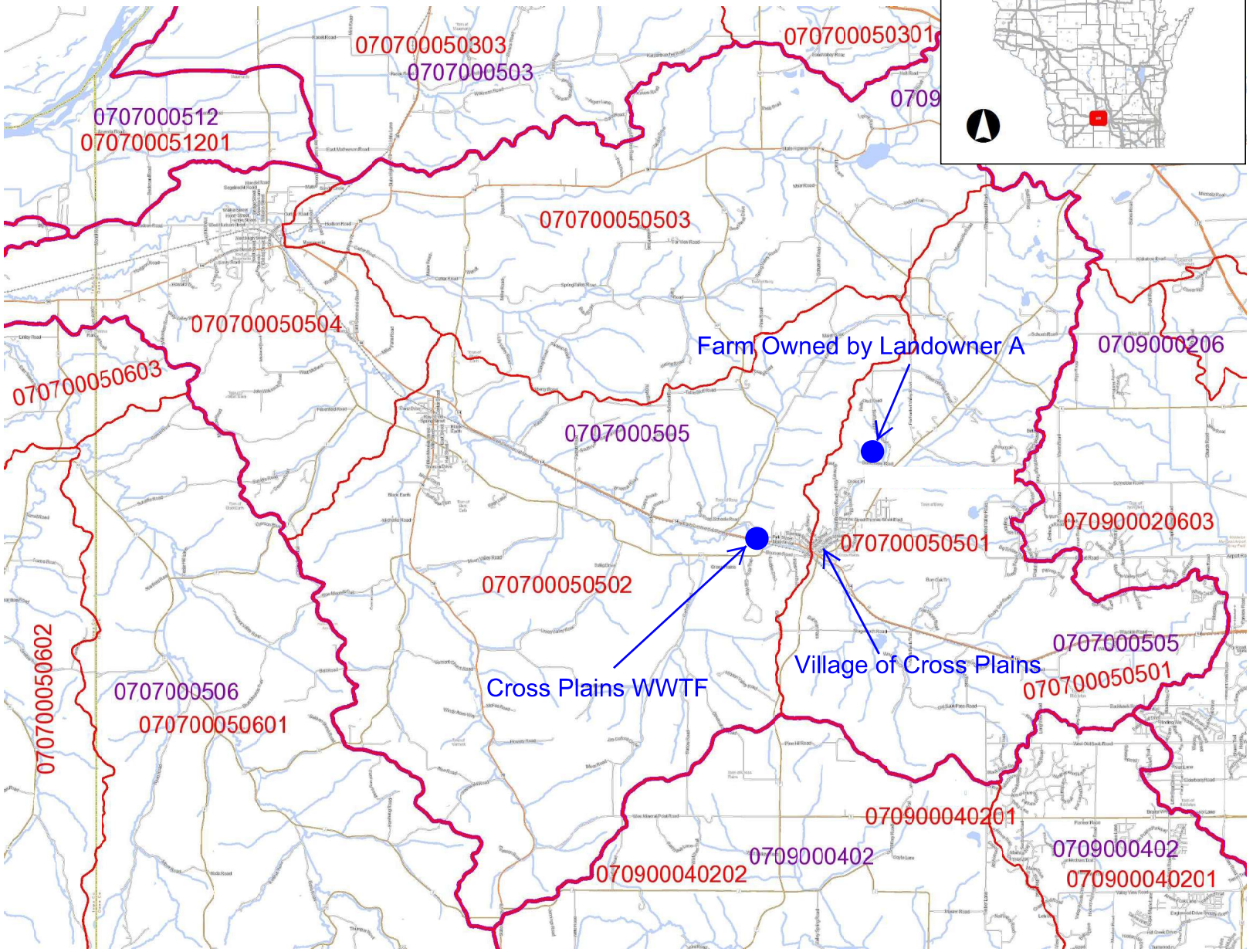
Appendix E

Sample Point ID	Permit No.	Facility Name	Receiving Water	Major Basin	Watershed Area	Nonpoint Load *	2009-2011 Avg. Upstream Point Source Load	2009-2011 Avg. Point Source Load	Total Load *	Point : Nonpoint Source Ratio *	Nonpoint Source Dominated?	Model Flag
					(mi^2)	(lbs)	(lbs)	(lbs)	(lbs)	(%)		**
52178	61271	EPHRAIM WASTEWATER TREATMENT FACILITY	Lake Michigan	Twin - Door - Kewaunee				45			No Result	
50309	35203	FISH CREEK SD1 WASTEWATER TREATMENT FACILITY	Lake Michigan	Twin - Door - Kewaunee				67			No Result	
49549	28894	FORESTVILLE WASTEWATER TREATMENT FACILITY	Ahnapee River	Twin - Door - Kewaunee	42.2	11411	0	449	11860	4:96	Yes	
47542	20176	KEWAUNEE WASTEWATER TREATMENT FACILITY	Kewaunee River	Twin - Door - Kewaunee	141.4	247710	357	165	248232	0:100	Yes	
50337	35874	KOSSUTH SANITARY DISTRICT NO. 2 WWTF	Unnamed	Twin - Door - Kewaunee	0.9	2314	0	28	2342	1:99	Yes	
58099	61051	MARIBEL WASTEWATER TREATMENT FACILITY	Unnamed	Twin - Door - Kewaunee	2.1	5732	0	254	5986	4:96	Yes	
48044	21369	MISHICOT WASTEWATER TREATMENT FAC	East Twin River	Twin - Door - Kewaunee	114.0	88454	316	0	88770	0:100	Yes	
52224	70581	PACKERLAND WHEY PRODUCTS INC	Unnamed	Twin - Door - Kewaunee	1.9	4527	0	93	4620	2:98	Yes	
49186	26654	SEVASTOPOL SD NO 1 WWTF	Donlans Creek	Twin - Door - Kewaunee	6.6	3524	0	39	3563	1:99	Yes	
48276	22071	SISTER BAY WASTEWATER TREATMENT FACILITY	Lake Michigan	Twin - Door - Kewaunee				133			No Result	
47954	21113	STURGEON BAY UTILITIES WWTF	Lake Michigan	Twin - Door - Kewaunee				1681			No Result	
49174	26590	TWO RIVERS WASTEWATER TREATMENT FACILITY	West Twin River	Twin - Door - Kewaunee	305.9	388941	1149	2928	393018	1:99	Yes	
49653	29343	WI DNR PENINSULA STATE PARK WWTF	Tennison Bay Marsh	Twin - Door - Kewaunee				91			No Result	
48569	23141	ABBOTSFORD WASTEWATER TREATMENT FACILITY	Unnamed	Wisconsin River	0.5	43	63	516	622	93:7	Speak with WDNR Basin Engineer	
86919	57436	ABBYLAND FOODS INC ABBOTSFORD PLANT	Unnamed	Wisconsin River	0.5	33	0	63	96	66:34	Speak with WDNR Basin Engineer	
48571	23159	ADAMS WASTEWATER TREATMENT FACILITY	Little Roche a Cri Creek	Wisconsin River	57.8	5899	0	324	6223	5:95	Yes	
48301	22144	ANTIGO CITY OF	Spring Brook	Wisconsin River	37.8	2364	0	1437	3801	38:62	Yes	
50034	31267	ARPIN WASTEWATER TREATMENT FACILITY	Hemlock Creek	Wisconsin River	5.3	1013	0	589	1602	37:63	Yes	
48365	22365	ATHENS WASTEWATER TREATMENT FACILITY	Black Creek	Wisconsin River	52.8	15762	0	1503	17265	9:91	Yes	
48386	22411	AUBURNDALE WASTEWATER TREATMENT FACILITY	Little Bear Creek	Wisconsin River	1.3	225	0	1227	1452	85:15	Speak with WDNR Basin Engineer	
51916	60151	AVOCA WASTEWATER TREATMENT FACILITY	Morrey Creek	Wisconsin River	18.6	8802	0	481	9283	5:95	Yes	
50818	43974	BADGER ARMY AMMUNITION PLANT	Wisconsin River	Wisconsin River	9010.5	1862130	248920	3320	2114370	12:88	Yes	
47737	20605	BARABOO WASTEWATER TREATMENT FACILITY	Baraboo River	Wisconsin River	573.8	419248	13637	1052	433937	3:97	Yes	
55843	31313	BETHEL CENTER WWTF	Unnamed	Wisconsin River	1.8	178	0	202	380	53:47	Speak with WDNR Basin Engineer	
50165	31950	BLENKER SHERRY SANITARY DISTRICT WWTP	Mill Creek	Wisconsin River	41.8	14454	9271	248	23973	40:60	Yes	
48634	23418	BLUE RIVER WASTEWATER TREATMENT FACILITY	Blue River	Wisconsin River	10614.7	2849180	270204	258	3119642	9:91	Yes	
50410	36749	BOAZ WASTEWATER TREATMENT FACILITY	Mill Creek	Wisconsin River	59.0	62265	0	106	62371	0:100	Yes	
48291	22110	BOSCOBEL WASTEWATER TREATMENT FACILITY	Wisconsin River	Wisconsin River	10762.7	2932360	270462	325	3203147	8:92	Yes	
48298	22136	BROKAW WASTEWATER TREATMENT FACILITY	Wisconsin River	Wisconsin River	3024.9	296700	60605	21	357326	17:83	Yes	
48656	23523	CAMBRIA WASTEWATER TREATMENT FACILITY	North Branch Duck Creek	Wisconsin River	8.7	4624	0	646	5270	12:88	Yes	
50132	31801	CAZENOVIA WASTEWATER TREATMENT FACILITY	Little Baraboo River	Wisconsin River	60.9	65477	0	551	66028	1:99	Yes	
53006	50245	CEDAR GROVE CHEESE FACTORY	Honey Creek	Wisconsin River	43.0	32083	1070	27	33180	3:97	Yes	
49979	30961	CHILI WASTEWATER TREATMENT FACILITY	Unnamed	Wisconsin River	0.7	514	0	252	766	33:67	Yes	
48680	23655	COLBY CITY WWTF	Dill Creek	Wisconsin River	12.9	3897	0	314	4211	7:93	Yes	
52176	61263	CROCKETT'S RESORT	Wisconsin River	Wisconsin River	7763.9	1347750	225538	20	1573308	14:86	Yes	
47811	20788	CROSS PLAINS WASTEWATER TREATMENT FACILITY	Black Earth Creek	Wisconsin River	26.6	12272	0	443	12715	3:97	Yes	
53376	49616	DANE IOWA WASTEWATER COMMISSION WWTF	Black Earth Creek	Wisconsin River	101.9	68697	443	731	69871	2:98	Yes	
49178	26620	DEL MONTE FOODS CAMBRIA PLANT #108	North Branch Duck Creek	Wisconsin River	11.0	6250	686	504	7440	16:84	Yes	
47375	3620	DOMTAR A W LLC	Wisconsin River	Wisconsin River	5543.1	743030	190926	22726	956682	22:78	Yes	
49094	26042	DOMTAR PAPER CO LLC	Wisconsin River	Wisconsin River	3987.6	469069	73114	9982	552165	15:85	Yes	
48251	22004	EAGLE RIVER CITY OF	Eagle River	Wisconsin River	237.7	18506	1142	451	20099	8:92	Yes	
50412	36765	EASTMAN WASTEWATER TREATMENT FACILITY	Pine Creek	Wisconsin River	12.8	13859	0	381	14240	3:97	Yes	
48191	21784	EDGAR WASTEWATER TREATMENT FACILITY	Scotch Creek	Wisconsin River	15.2	7335	0	948	8283	11:89	Yes	
48740	23931	ELROY WASTEWATER TREATMENT FACILITY	Baraboo River	Wisconsin River	65.5	75277	551	1404	77232	3:97	Yes	
47355	3565	ERCO WORLDWIDE (USA) INC - PORT EDWARDS	Wisconsin River	Wisconsin River	5548.6	744793	213873	1826	960492	22:78	Yes	
50061	31411	FENWOOD WASTEWATER TREATMENT FACILITY	Fenwood Creek	Wisconsin River	16.3	7355	0	18	7373	0:100	Yes	
61012	49964	FISH, CRYSTAL AND MUD LAKE REHABILITATION DISTRICT	Wisconsin River	Wisconsin River	9032.0	1863530	252240	387	2116157	12:88	Yes	
47467	4413	FOREMOST FARMS USA - RICHLAND CENTER	Pine River	Wisconsin River	191.1	175589	11939	0	187528	6:94	Yes	
52926	3859	FOREMOST FARMS USA COOP PLOVER	Wisconsin River	Wisconsin River	5163.6	661101	118956	3215	783272	16:84	Yes	
47423	3875	FOREMOST FARMS USA COOP ROTHSCHILD	Wisconsin River	Wisconsin River	4002.2	470291	83096	466	553853	15:85	Yes	
44787	35	FOREMOST FARMS USA REEDSBURG	Baraboo River	Wisconsin River	386.8	314608	5858	38	320504	2:98	Yes	
48337	22268	GAYS MILLS WASTEWATER TREATMENT FACILITY	Kickapoo River	Wisconsin River	616.1	577675	4497	557	582729	1:99	Yes	
50352	35998	GOETZ COMPANIES INC (PORTAGE PETRO TRAVEL P)	Baraboo River	Wisconsin River	648.5	447878	14689	141	462708	3:97	Yes	
51359	51764	GRANDE CHEESE CORP WYOCENA	Unnamed	Wisconsin River	74.6	22121	1190	34	23345	5:95	Yes	
50037	31275	HEWITT SANITARY DISTRICT WWTP	Mill Creek	Wisconsin River	10.3	1596	8683	588	10867	85:15	Speak with WDNR Basin Engineer	
50417	36790	HIGHLAND WASTEWATER TREATMENT FACILITY	Unnamed	Wisconsin River	0.3	163	0	460	623	74:26	Speak with WDNR Basin Engineer	
50316	35483	HILL POINT SANITARY DISTRICT WWTF	Hill Point Creek	Wisconsin River	9.4	11849	0	143	11992	1:99	Yes	
47726	20583	HILLSBORO WASTEWATER TREATMENT FACILITY	West Branch Baraboo River	Wisconsin River	39.3	34508	0	439	34947	1:99	Yes	
51147	49689	HUB ROCK SANITARY DISTRICT #1 WWTF	Pine River	Wisconsin River	121.1	120796	0	231	121027	0:100	Yes	
50183	32085	HUSTLER WASTEWATER TREATMENT FACILITY	Little Lemonweir River	Wisconsin River	37.9	60511	0	103	60614	0:100	Yes	
49401	28070	JUNCTION CITY WASTEWATER TREATMENT FACILITY	Unnamed	Wisconsin River	0.7	280	0	139	419	33:67	Yes	
47704	20516	KENDALL WASTEWATER TREATMENT FACILITY	Baraboo River	Wisconsin River	16.0	18548	0	551	19099	3:97	Yes	
48816	24465	LA FARGE WASTEWATER TREATMENT PLANT	Kickapoo River	Wisconsin River	301.6	287653	2237	560	290450	1:99	Yes	
49545	28878	LA VALLE WASTEWATER TREATMENT FACILITY	Baraboo River	Wisconsin River	307.8	267080	4643	225	271948	2:98	Yes	
52374	36374	LAKE TOMAHAWK TOWNSHIP SANITARY DISTRICT 1	Wisconsin River	Wisconsin River	745.5	47832	1593	460	49885	4:96	Yes	
48514	22837	LAKELAND SANITARY DISTRICT	Tomahawk River	Wisconsin River	71.6	2127	12	502	2641	19:81	Yes	
51824	57738	LAKESIDE FOODS INC. - REEDSBURG	Baraboo River	Wisconsin River	385.7	314535	4868	990	320393	2:98	Yes	
47308	3450	LIGNOTECH USA INC	Wisconsin River	Wisconsin River	3987.3	469036	72778	336	542150	13:87	Yes	
50391	36447	LIME RIDGE WASTEWATER TREATMENT FACILITY	Narrows Creek	Wisconsin River	0.9	462	0	58	520	11:89	Yes	
48538	22918	LODI WASTEWATER TREATMENT FACILITY	Spring Creek	Wisconsin River	37.7	11501	0	986	12487	8:92	Yes	
49604	29114	LOGANVILLE WASTEWATER TREATMENT FACILITY	Narrows Creek	Wisconsin River	43.3	51798	201	284	52283	1:99	Yes	
54387	60488	LYNDON STATION WASTEWATER TREATMENT FACILITY	Lyndon Creek	Wisconsin River	6.8	2012	0	306	2318	13:87	Yes	
47589	20273	MARATHON WATER & SEWER DPT WW TREATMNT PLANT	Big Rib River	Wisconsin River	370.4	110935	2582	813	114330	3:97	Yes	
64228	21024	MARSHFIELD WASTEWATER TREATMENT FACILITY	Mill Creek	Wisconsin River	8.5	1105	0	8683	9788	89:11	Speak with WDNR Basin Engineer	
48848	24635	MAUSTON WASTEWATER TREATMENT FACILITY	Lemonweir River	Wisconsin River	567.0	250955	3782	755	255492	2:98	Yes	
51632	54518	MCCAIN FOODS USA, INC., PLOVER	Wisconsin River	Wisconsin River	5314.4	701691	133627	11250	846568	17:83	Yes	
47532	20150	MERRILL CITY OF	Wisconsin River	Wisconsin River	2750.1	248984	52848	2587	304419	18:82	Yes	

Village of Cross Plains WWTF HUC 10



Legend

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

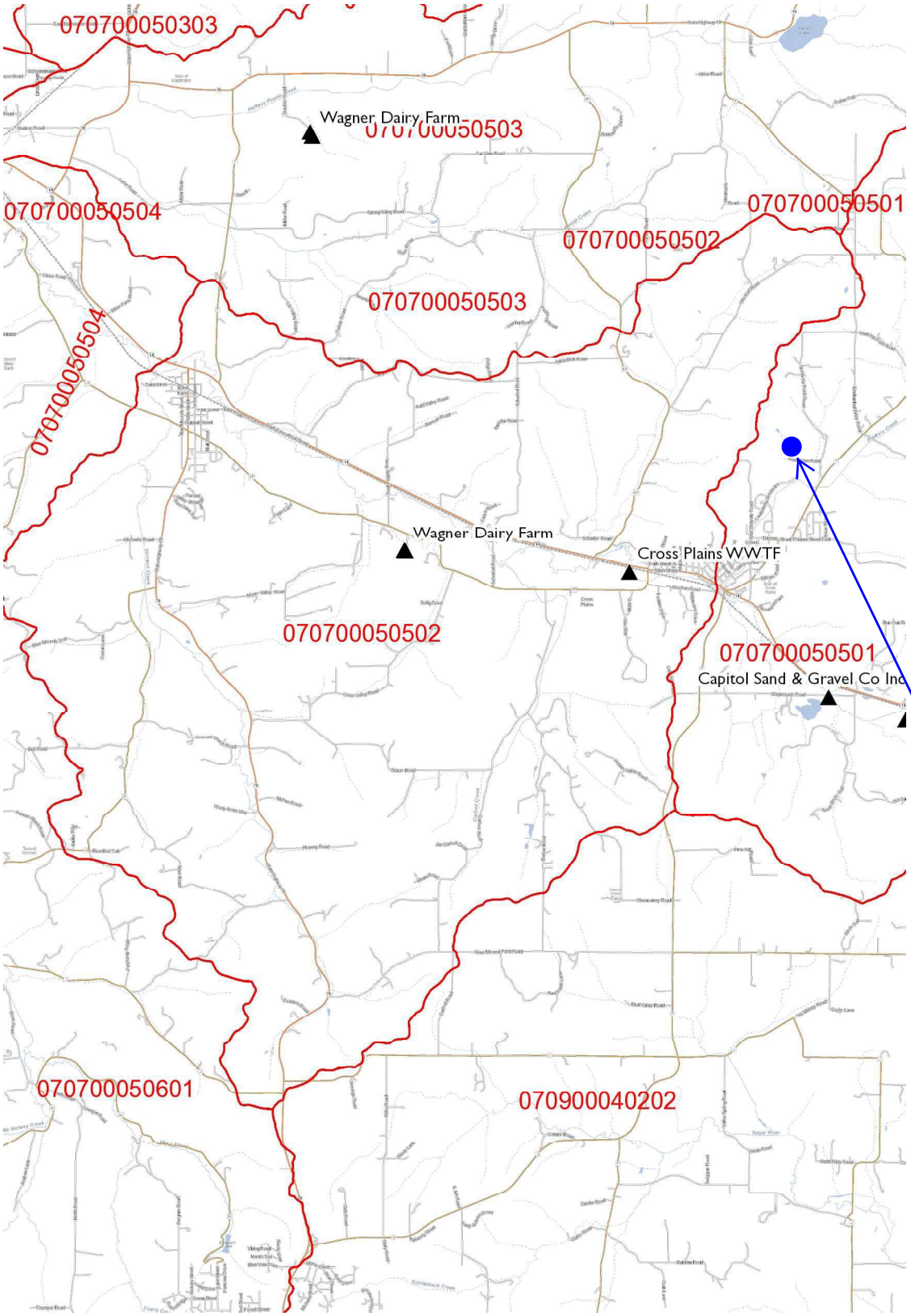
Notes

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

Village of Cross Plains WWTF HUC 12



Legend

- Surface Water Outfalls
- 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

Farm Owned by Property Owner A

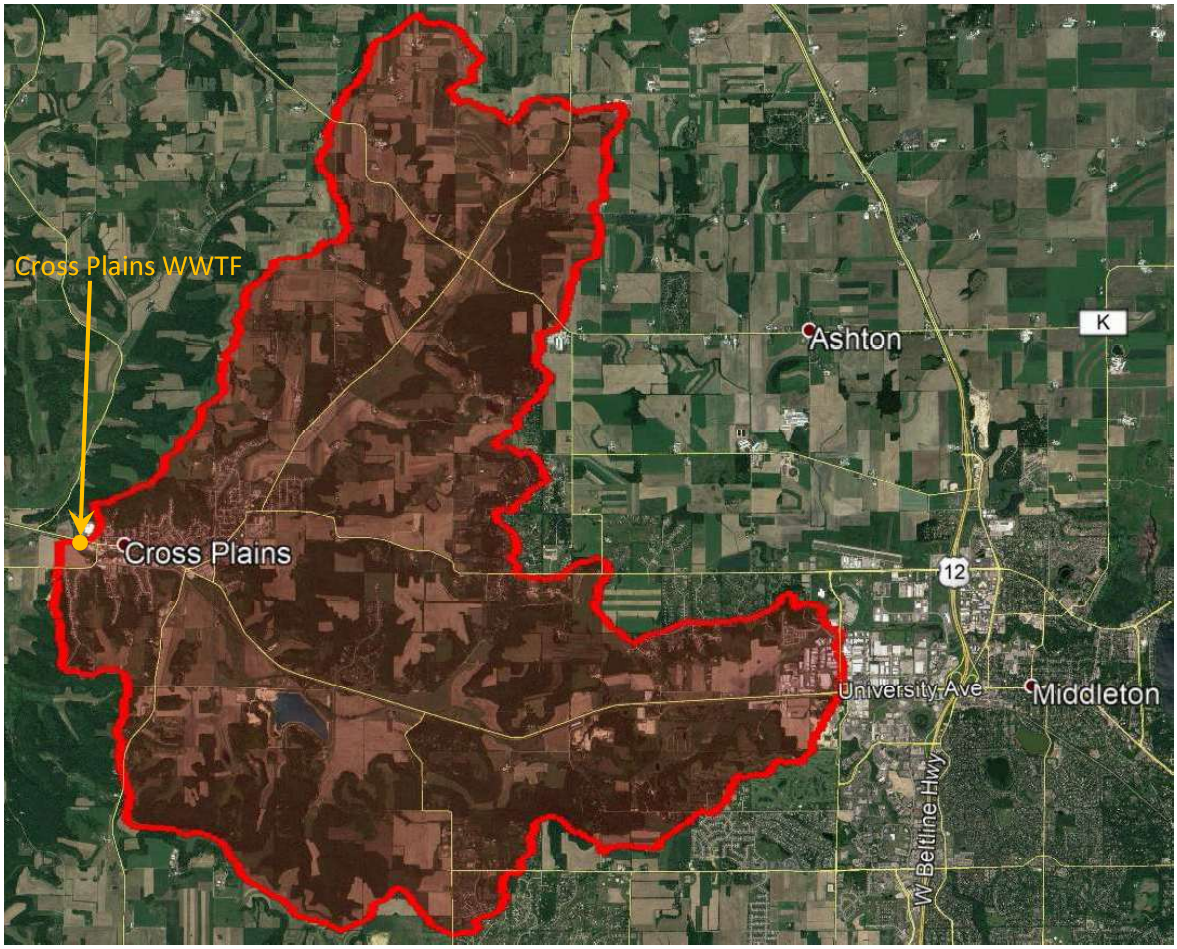
3.0 0 1.50 3.0 Miles

1: 95,040

NAD_1983_HARN_Wisconsin_TM

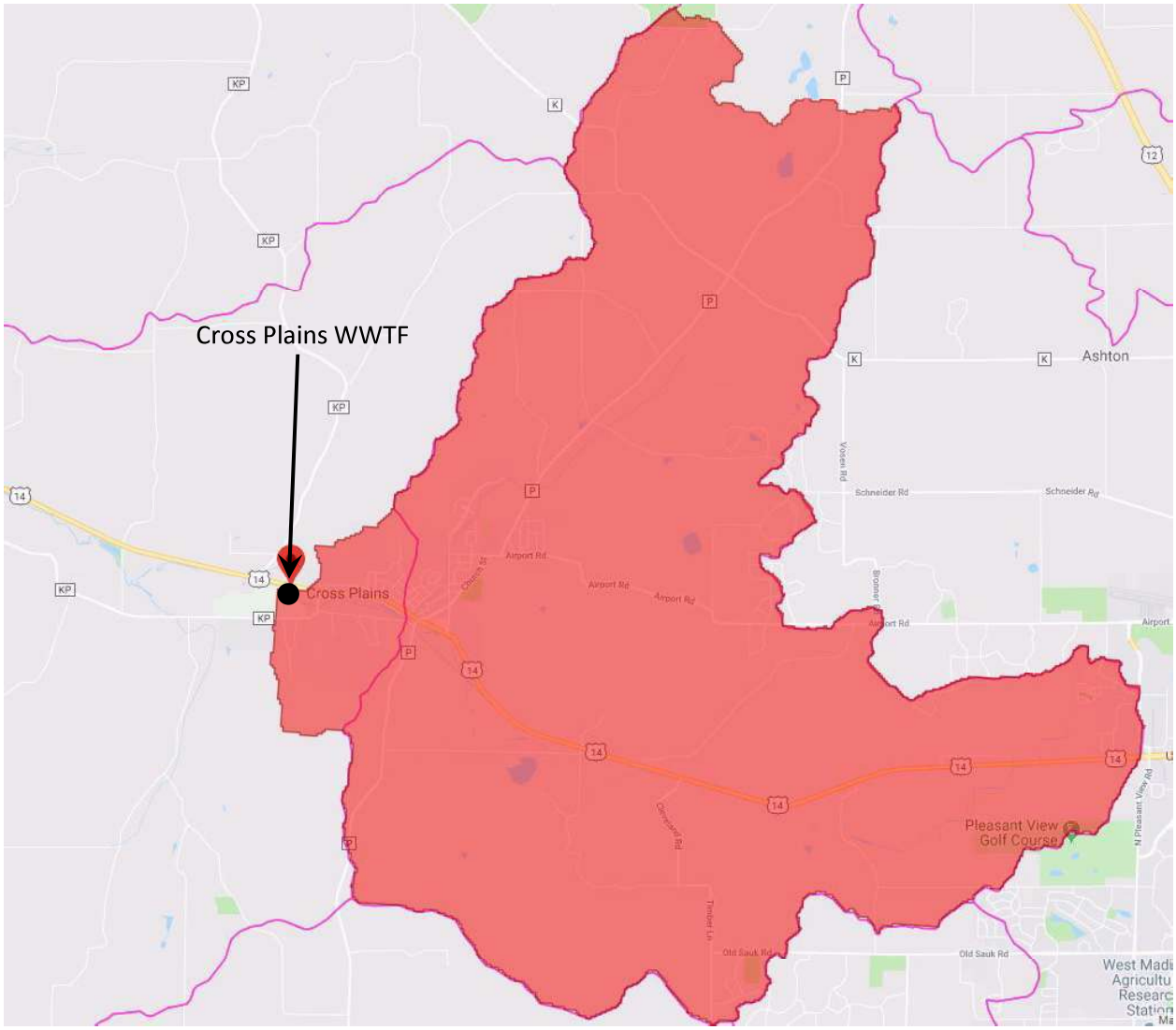
Notes

Map #1 of Watershed Upstream from Cross Plains WWTP



Source: Purdue University's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Map #2 of Watershed Upstream from Cross Plains WWTP



Source: Purdue University's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Table -- Land Use in HUC-10 (0707000505) Watershed with Cross Plains WWTF and Farm Owned by Landowner A

Land Use	Soil Group	Area [acres]	Sub-Total [acres]	% of Watershed
Open Water	A	6.23		
Open Water	B	178.36	202.60	0.3%
Open Water	D	18.01		
Open Space/Park	A	211.05		
Open Space/Park	B	2004.44	3,023.00	4.5%
Open Space/Park	C	195.26		
Open Space/Park	D	612.25		
Low-Density Residential (general 1/3 - 2 ac lots)	A	190.15		
Low-Density Residential (general 1/3 - 2 ac lots)	B	1264.54	1,712.22	2.5%
Low-Density Residential (general 1/3 - 2 ac lots)	C	40.25		
Low-Density Residential (general 1/3 - 2 ac lots)	D	217.28		
High-density Residential (townhomes to 1/4 ac lots)	A	26.46		
High-density Residential (townhomes to 1/4 ac lots)	B	180.81	227.29	0.3%
High-density Residential (townhomes to 1/4 ac lots)	C	5.34		
High-density Residential (townhomes to 1/4 ac lots)	D	14.68		
Commercial/Industrial/Transportation	A	20.46		
Commercial/Industrial/Transportation	B	66.50	98.97	0.1%
Commercial/Industrial/Transportation	C	5.34		
Commercial/Industrial/Transportation	D	6.67		
Barren Land	A	12.90		
Barren Land	B	14.23	28.91	0.0%
Barren Land	D	1.78		
Deciduous Forest	A	550.65		
Deciduous Forest	B	10509.49	21,969.27	32.7%
Deciduous Forest	C	946.29		
Deciduous Forest	D	9962.84		
Evergreen Forest	A	37.58		
Evergreen Forest	B	138.33	520.17	0.8%
Evergreen Forest	C	20.68		
Evergreen Forest	D	323.58		
	A	2.67		
Mixed Forest	B	44.26	170.36	0.3%
Mixed Forest	C	2.89		
Mixed Forest	D	123.21		
Shrub; Scrub	A	54.71		
Shrub; Scrub	B	543.76	979.66	1.5%
Shrub; Scrub	C	68.28		
Shrub; Scrub	D	312.91		
Grassland; Herbaceous	A	27.13		
Grassland; Herbaceous	B	154.56	317.13	0.5%
Grassland; Herbaceous	C	53.15		
Grassland; Herbaceous	D	109.42		
Pasture/Hay	A	525.30		
Pasture/Hay	B	11601.45	16,699.63	24.8%
Pasture/Hay	C	818.19		
Pasture/Hay	D	3754.69		
Cropland generalized agriculture	A	1627.04		
Cropland generalized agriculture	B	13251.40	20,647.14	30.7%
Cropland generalized agriculture	C	998.33		
Cropland generalized agriculture	D	4770.37		
Woody Wetlands (swamp)	A	8.01		
Woody Wetlands (swamp)	B	26.24	110.31	0.2%
Woody Wetlands (swamp)	C	6.45		
Woody Wetlands (swamp)	D	77.62		
Emergent Wetlands (marsh)	A	18.90		
Emergent Wetlands (marsh)	B	92.96	509.95	0.8%
Emergent Wetlands (marsh)	C	45.81		
Emergent Wetlands (marsh)	D	371.18		
Total		**67,273.30**	**acres**	

Source: Purdue Univ's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Table -- Land Use in HUC-12 (070700050502) Watershed with Cross Plains WWTF

Land Use	Soil Group	Area [acres]	Sub-Total [acres]	% of Watershed
Open Water	B	4.89	4.89	0.0%
Open Space/Park	A	0.44	1,015.46	4.2%
Open Space/Park	B	582.90		
Open Space/Park	C	149.23		
Open Space/Park	D	282.89		
Low-Density Residential (general 1/3 - 2 ac lots)	A	1.78	455.69	1.9%
Low-Density Residential (general 1/3 - 2 ac lots)	B	349.38		
Low-Density Residential (general 1/3 - 2 ac lots)	C	10.01		
Low-Density Residential (general 1/3 - 2 ac lots)	D	94.52		
High-density Residential (townhomes to 1/4 ac lots)	A	0.22	71.61	0.3%
High-density Residential (townhomes to 1/4 ac lots)	B	64.72		
High-density Residential (townhomes to 1/4 ac lots)	C	0.22		
High-density Residential (townhomes to 1/4 ac lots)	D	6.45		
Commercial/Industrial/Transportation	B	11.56	13.11	0.1%
Commercial/Industrial/Transportation	C	0.22		
Commercial/Industrial/Transportation	D	1.33		
Barren Land	B	6.45	6.89	0.0%
Barren Land	D	0.44		
Deciduous Forest	A	9.12	9,449.56	38.9%
Deciduous Forest	B	3,222.95		
Deciduous Forest	C	652.28		
Deciduous Forest	D	5,565.21		
Evergreen Forest	A	0.22	166.79	0.7%
Evergreen Forest	B	25.80		
Evergreen Forest	C	20.68		
Evergreen Forest	D	120.09		
Mixed Forest	B	12.45	54.70	0.2%
Mixed Forest	C	2.89		
Mixed Forest	D	39.36		
Shrub; Scrub	A	1.56	427.23	1.8%
Shrub; Scrub	B	174.36		
Shrub; Scrub	C	61.16		
Shrub; Scrub	D	190.15		
Grassland; Herbaceous	B	38.70	158.57	0.7%
Grassland; Herbaceous	C	44.92		
Grassland; Herbaceous	D	74.95		
Pasture/Hay	A	3.78	5,839.42	24.1%
Pasture/Hay	B	2,904.03		
Pasture/Hay	C	585.57		
Pasture/Hay	D	2,346.04		
Cropland generalized agriculture	A	9.12	6,428.99	26.5%
Cropland generalized agriculture	B	3,395.08		
Cropland generalized agriculture	C	709.44		
Cropland generalized agriculture	D	2,315.35		
Woody Wetlands (swamp)	B	6.00	41.36	0.2%
Woody Wetlands (swamp)	C	6.23		
Woody Wetlands (swamp)	D	29.13		
Emergent Wetlands (marsh)	B	19.79	137.44	0.6%
Emergent Wetlands (marsh)	C	44.70		
Emergent Wetlands (marsh)	D	72.95		
Total		**24,271.73**	**acres**	

Source: Purdue Univ's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Table -- Land Use in HUC-12 (070700050501) Watershed with Farm Owned by Landowner A

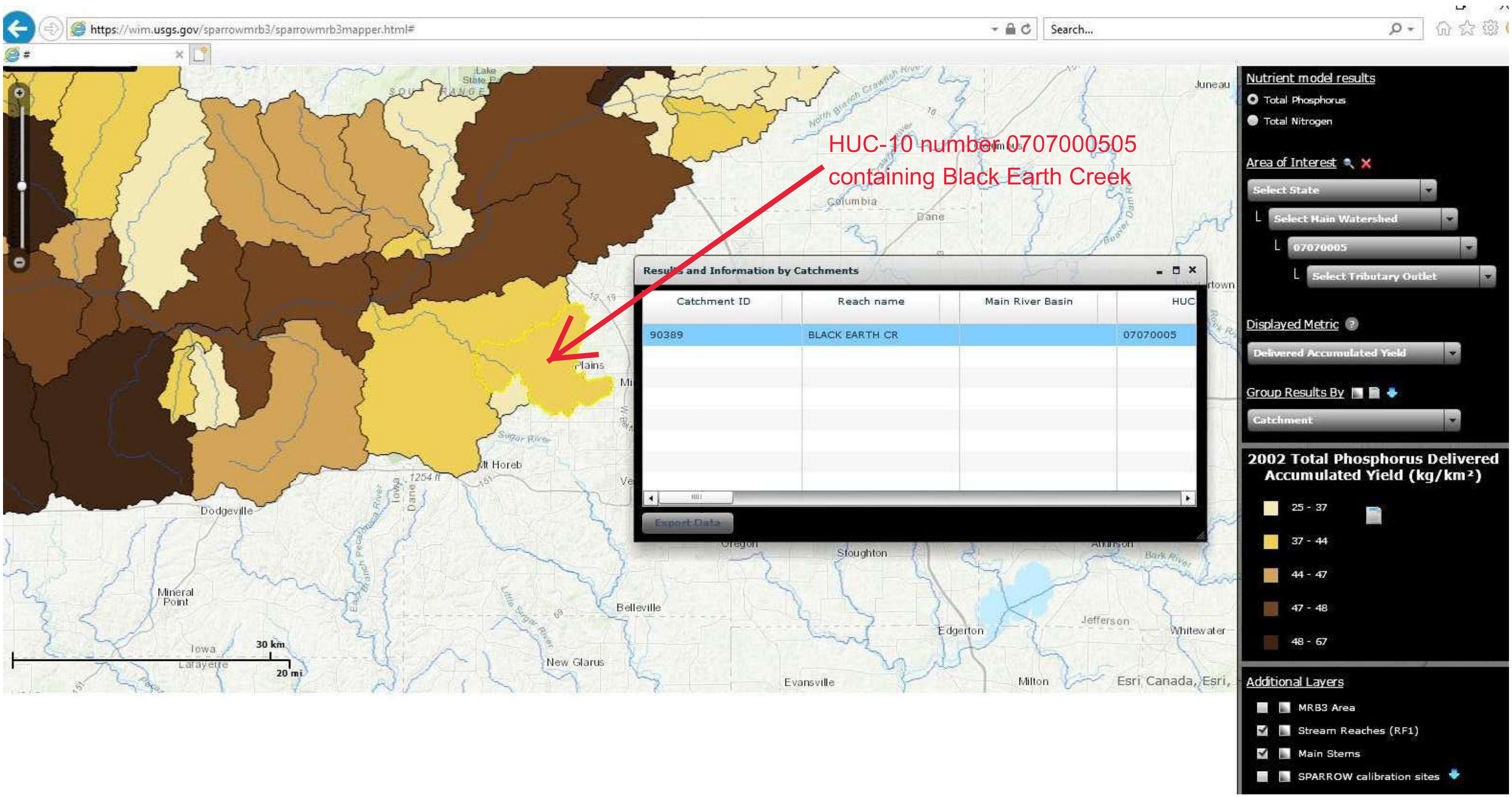
Land Use	Soil Group	Area [acres]	Sub-Total [acres]	% of Watershed
Open Water	A	6.23		
Open Water	B	65.38	75.84	0.5%
Open Water	D	4.23		
Open Space/Park	A	7.56		
Open Space/Park	B	685.2	831.53	5.1%
Open Space/Park	C	17.12		
Open Space/Park	D	121.65		
Low-Density Residential (general 1/3 - 2 ac lots)	A	7.56		
Low-Density Residential (general 1/3 - 2 ac lots)	B	647.61	745.46	4.6%
Low-Density Residential (general 1/3 - 2 ac lots)	C	22.46		
Low-Density Residential (general 1/3 - 2 ac lots)	D	67.83		
High-density Residential (townhomes to 1/4 ac lots)	A	1.11		
High-density Residential (townhomes to 1/4 ac lots)	B	84.51	97.41	0.6%
High-density Residential (townhomes to 1/4 ac lots)	C	5.12		
High-density Residential (townhomes to 1/4 ac lots)	D	6.67		
Commercial/Industrial/Transportation	B	50.71		
Commercial/Industrial/Transportation	C	5.12	61.17	0.4%
Commercial/Industrial/Transportation	D	5.34		
Barren Land	A	2		
Barren Land	B	3.11	6.44	0.0%
Barren Land	D	1.33		
Deciduous Forest	A	9.12		
Deciduous Forest	B	3508.06	4,744.14	29.2%
Deciduous Forest	C	52.49		
Deciduous Forest	D	1174.47		
Evergreen Forest	B	65.83	71.17	0.4%
Evergreen Forest	D	5.34		
Mixed Forest	B	10.23	11.34	0.1%
Mixed Forest	D	1.11		
Shrub; Scrub	A	2.22		
Shrub; Scrub	B	214.83	279.54	1.7%
Shrub; Scrub	C	1.11		
Shrub; Scrub	D	61.38		
Grassland; Herbaceous	B	60.94		
Grassland; Herbaceous	C	2	78.95	0.5%
Grassland; Herbaceous	D	16.01		
Pasture/Hay	A	23.8		
Pasture/Hay	B	3912.81	4,372.95	27.0%
Pasture/Hay	C	62.72		
Pasture/Hay	D	373.62		
Cropland generalized agriculture	A	57.38		
Cropland generalized agriculture	B	3867.22	4,735.45	29.2%
Cropland generalized agriculture	C	43.14		
Cropland generalized agriculture	D	767.71		
Woody Wetlands (swamp)	B	6.45	9.79	0.1%
Woody Wetlands (swamp)	D	3.34		
Emergent Wetlands (marsh)	A	2.89		
Emergent Wetlands (marsh)	B	17.35	100.97	0.6%
Emergent Wetlands (marsh)	D	80.73		
Total		**16,222.15**	**acres**	

Source: Purdue Univ's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Table -- Land Use in Watershed Upstream of Cross Plains WWTF's Discharge Point

Land Use	Soil Group	Area [acres]	Sub-Total [acres]	% of Watershed
Open Water	A	6.23	68.51	0.4%
Open Water	B	58.05		
Open Water	D	4.23		
Open Space/Park	A	7.56	822.42	5.1%
Open Space/Park	B	665.41		
Open Space/Park	C	18.24		
Open Space/Park	D	131.21		
Low-Density Residential (general 1/3 - 2 ac lots)	A	8.45	816.64	5.1%
Low-Density Residential (general 1/3 - 2 ac lots)	B	710.11		
Low-Density Residential (general 1/3 - 2 ac lots)	C	22.91		
Low-Density Residential (general 1/3 - 2 ac lots)	D	75.17		
High-density Residential (townhomes to 1/4 ac lots)	A	1.33	129.66	0.8%
High-density Residential (townhomes to 1/4 ac lots)	B	113.87		
High-density Residential (townhomes to 1/4 ac lots)	C	5.34		
High-density Residential (townhomes to 1/4 ac lots)	D	9.12		
Commercial/Industrial/Transportation	B	55.38	66.06	0.4%
Commercial/Industrial/Transportation	C	5.34		
Commercial/Industrial/Transportation	D	5.34		
Barren Land	A	2.00	7.33	0.0%
Barren Land	B	4.00		
Barren Land	D	1.33		
Deciduous Forest	A	9.12	4,973.63	31.0%
Deciduous Forest	B	3,505.83		
Deciduous Forest	C	52.26		
Deciduous Forest	D	1,406.42		
Evergreen Forest	B	66.27	83.62	0.5%
Evergreen Forest	D	17.35		
Mixed Forest	B	11.79	14.01	0.1%
Mixed Forest	D	2.22		
Shrub; Scrub	A	2.22	293.11	1.8%
Shrub; Scrub	B	213.28		
Shrub; Scrub	C	1.11		
Shrub; Scrub	D	76.50		
Grassland; Herbaceous	B	60.27	82.06	0.5%
Grassland; Herbaceous	C	2.00		
Grassland; Herbaceous	D	19.79		
Pasture/Hay	A	23.80	3,979.99	24.8%
Pasture/Hay	B	3457.35		
Pasture/Hay	C	62.72		
Pasture/Hay	D	436.12		
Cropland generalized agriculture	A	58.93	4,593.56	28.6%
Cropland generalized agriculture	B	3,695.76		
Cropland generalized agriculture	C	42.92		
Cropland generalized agriculture	D	795.95		
Woody Wetlands (swamp)	B	6.45	9.79	0.1%
Woody Wetlands (swamp)	D	3.34		
Emergent Wetlands (marsh)	A	2.89	98.52	0.6%
Emergent Wetlands (marsh)	B	14.90		
Emergent Wetlands (marsh)	D	80.73		
Total		**16,038.89**	**acres**	

Source: Purdue Univ's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/



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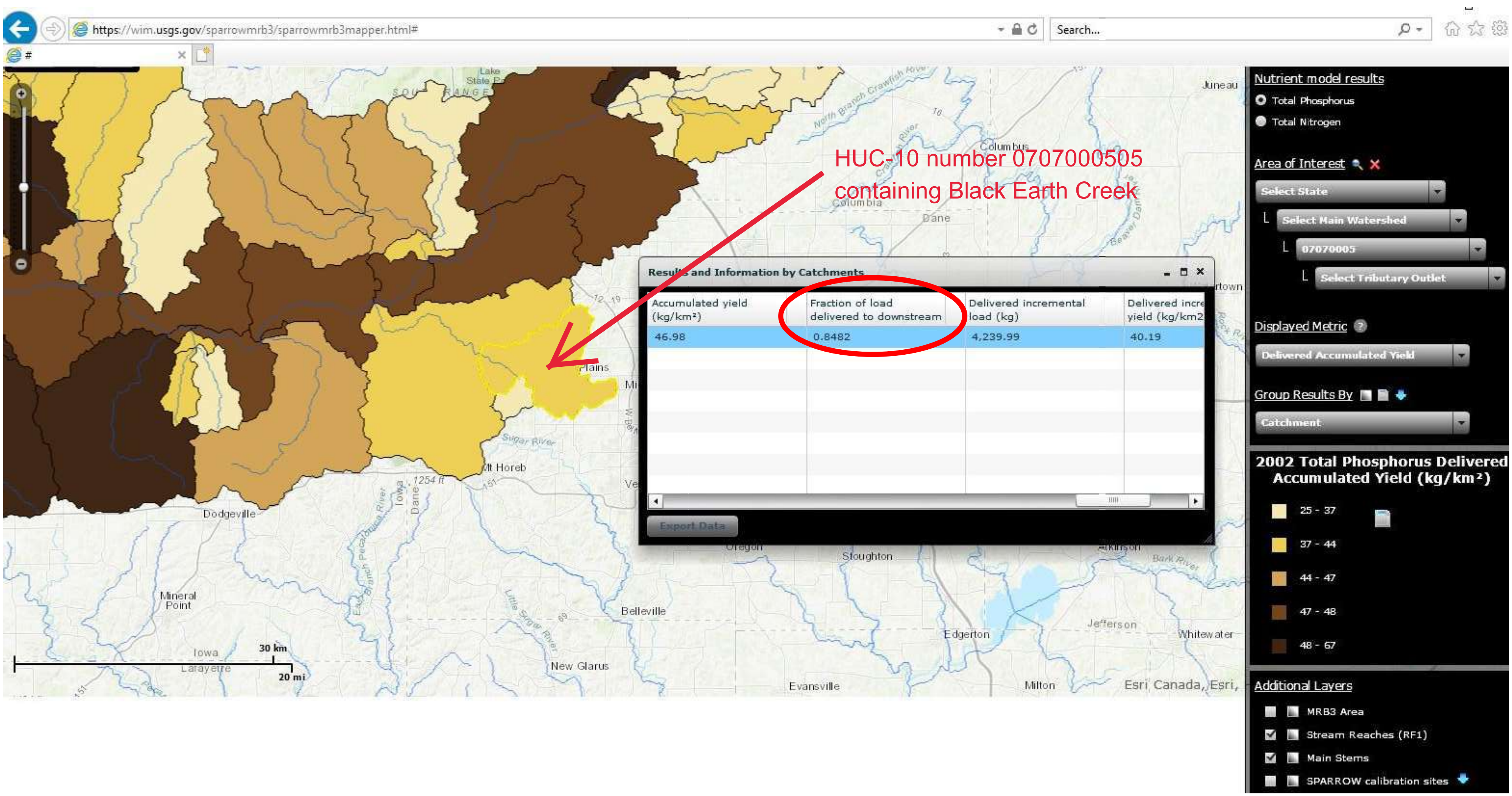
HUC-10 number 0707000505
containing Black Earth Creek
Results and Information by Catchments
Catchment ID
Reach name
Main River Basin
HUC
90389
BLACK EARTH CR
07070005
Export Data
Nutrient model results
Total Phosphorus
Total Nitrogen
Area of Interest
Select State
Select Main Watershed
07070005
Select Tributary Outlet
Displayed Metric
Delivered Accumulated Yield
Group Results By
Catchment
2002 Total Phosphorus Delivered Accumulated Yield (kg/km²)
25 - 37
37 - 44
44 - 47
47 - 48
48 - 67
Additional Layers
MRB3 Area
Stream Reaches (RF1)
Main Stems
SPARROW calibration sites
Juneau
Columbia
Dane
Plains
Mt Horeb
Dodgeville
Mineral Point
Iowa
Lafayette
Belleville
New Glarus
Oregon
Stoughton
Evansville
Edgerton
Milton
Jefferson
Whitewater
Sugar River
Little Sugar River
30 km
20 mi
Esri, Canada, Esri,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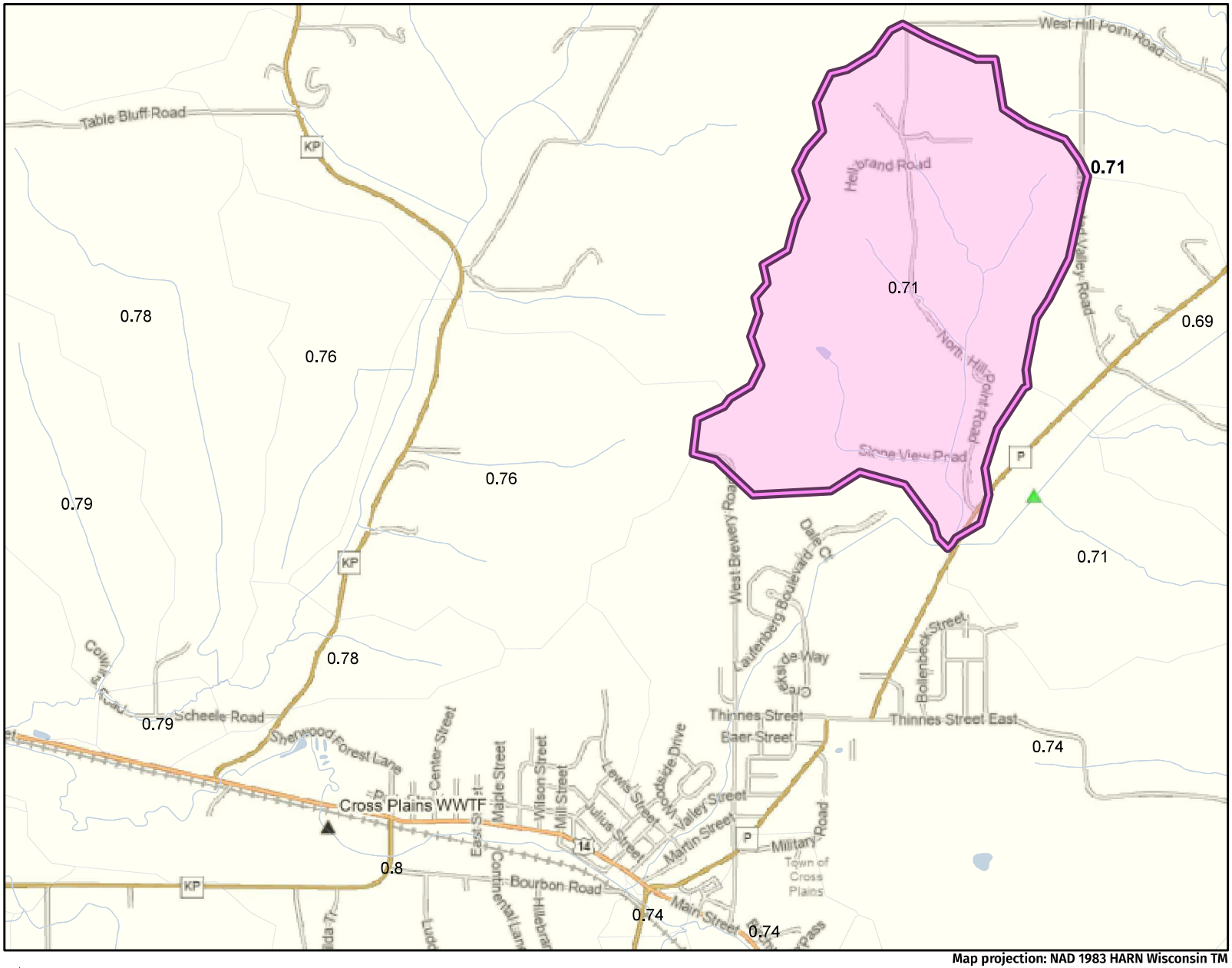
HUC-10 number 0707000505
containing Black Earth Creek
Results and Information by Catchments
Accumulated yield (kg/km²)
Fraction of load delivered to downstream
Delivered incremental load (kg)
Delivered incre yield (kg/km2
46.98
0.8482
4,239.99
40.19
Export Data
Nutrient model results
Total Phosphorus
Total Nitrogen
Area of Interest
Select State
Select Main Watershed
07070005
Select Tributary Outlet
Displayed Metric
Delivered Accumulated Yield
Group Results By
Catchment
2002 Total Phosphorus Delivered Accumulated Yield (kg/km²)
25 - 37
37 - 44
44 - 47
47 - 48
48 - 67
Additional Layers
MRB3 Area
Stream Reaches (RF1)
Main Stems
SPARROW calibration sites
Esri, Canada, Esri,

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Village of Cross Plains WQT Project SPARROW Value



Legend: (some map layers may not be displayed)

- SPARROW Model Catchment
  - 0.621401 - 0.825600
- Exemption Determinations
- Surface Water Outfalls
- 24K Lakes and Open Water
- 24K Streams and Rivers
- 24K Intermittent Streams
- City or Village
- County Boundaries
- Major Roads
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

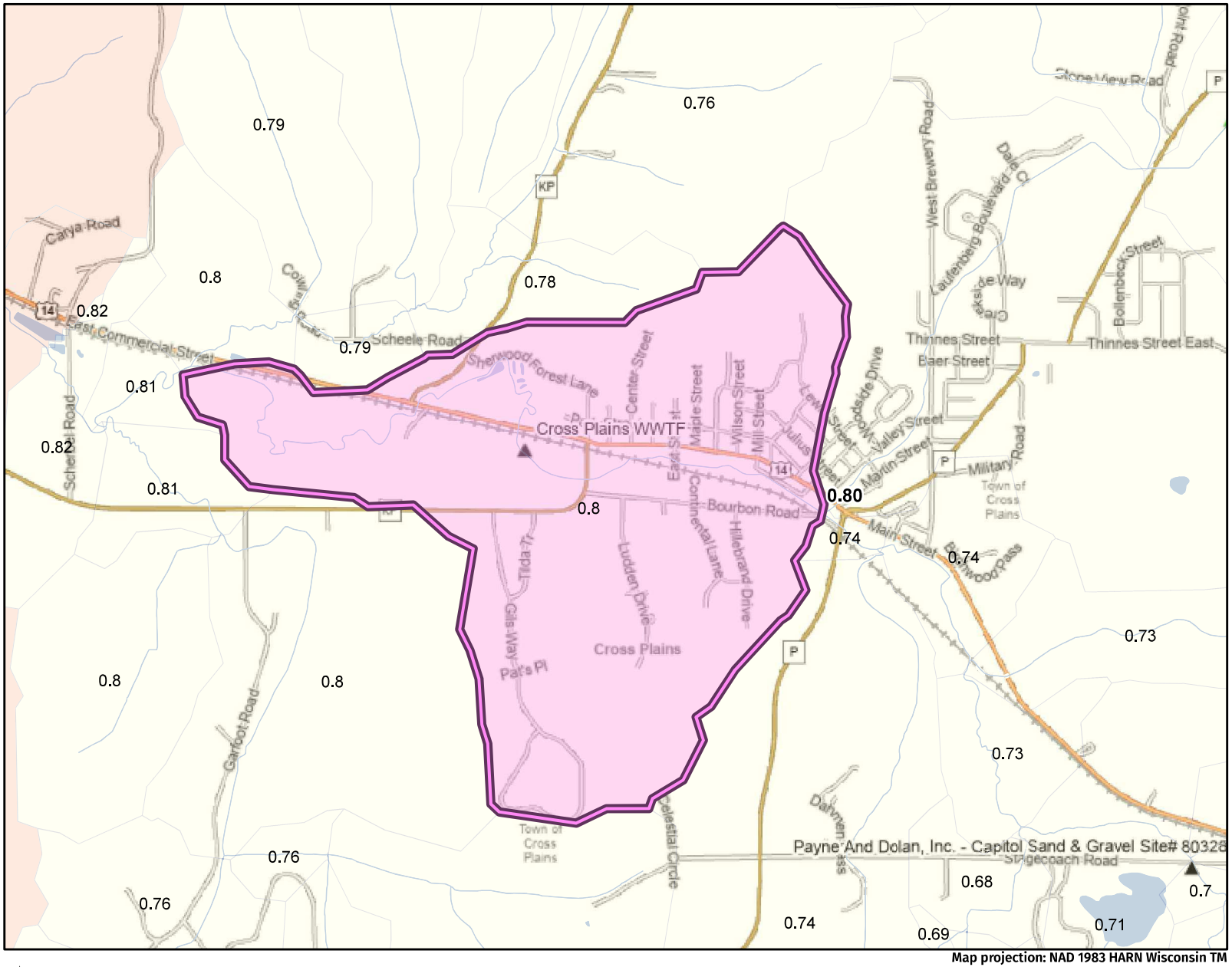
Map: 0 2,000 4,000 Feet
0 600 1,200 Meters

Service Layer Credits:
Permits & Determinations: WI DNR Bureau of Watershed Management, Cities, Roads & Boundaries:

Date Printed: 2/26/2025 3:17 PM

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Village of Cross Plains WWTF SPARROW Value



Legend: (some map layers may not be displayed)

SPARROW Model Catchment
- 0.621401 - 0.825600
- 0.825601 - 0.947100

Exemption Determinations

Surface Water Outfalls

24K Lakes and Open Water

24K Streams and Rivers

24K Intermittent Streams

City or Village

County Boundaries

Major Roads
- US Highway

County and Local Roads
- County HWY
- Local Road

Railroads

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

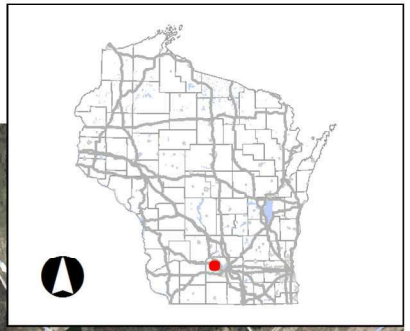
Map: 0 2,000 4,000 Feet
0 600 1,200 Meters

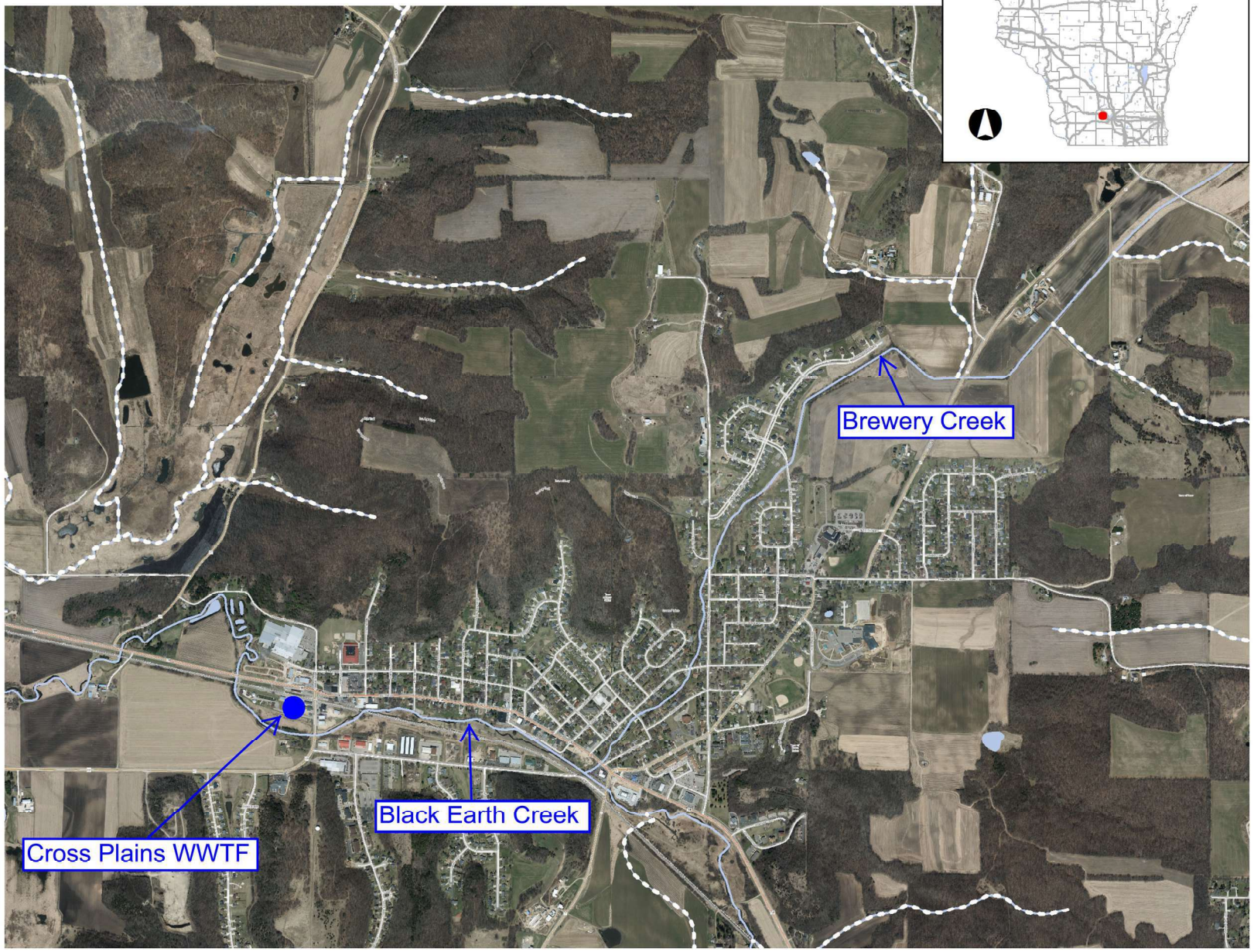
Service Layer Credits:
Permits & Determinations: WI DNR Bureau of Watershed Management, Cities, Roads & Boundaries:

Date Printed: 2/26/2025 3:15 PM

Appendix F

Aerial Photo of Village of Cross Plains





Legend

- Intermittent Streams
- 24K Hydrography Streams and Rivers
- 24K Hydrography Lakes and Open Water
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

Notes

0.8 0 0.38 0.8 Miles

NAD_1983_HARN_Wisconsin_TM

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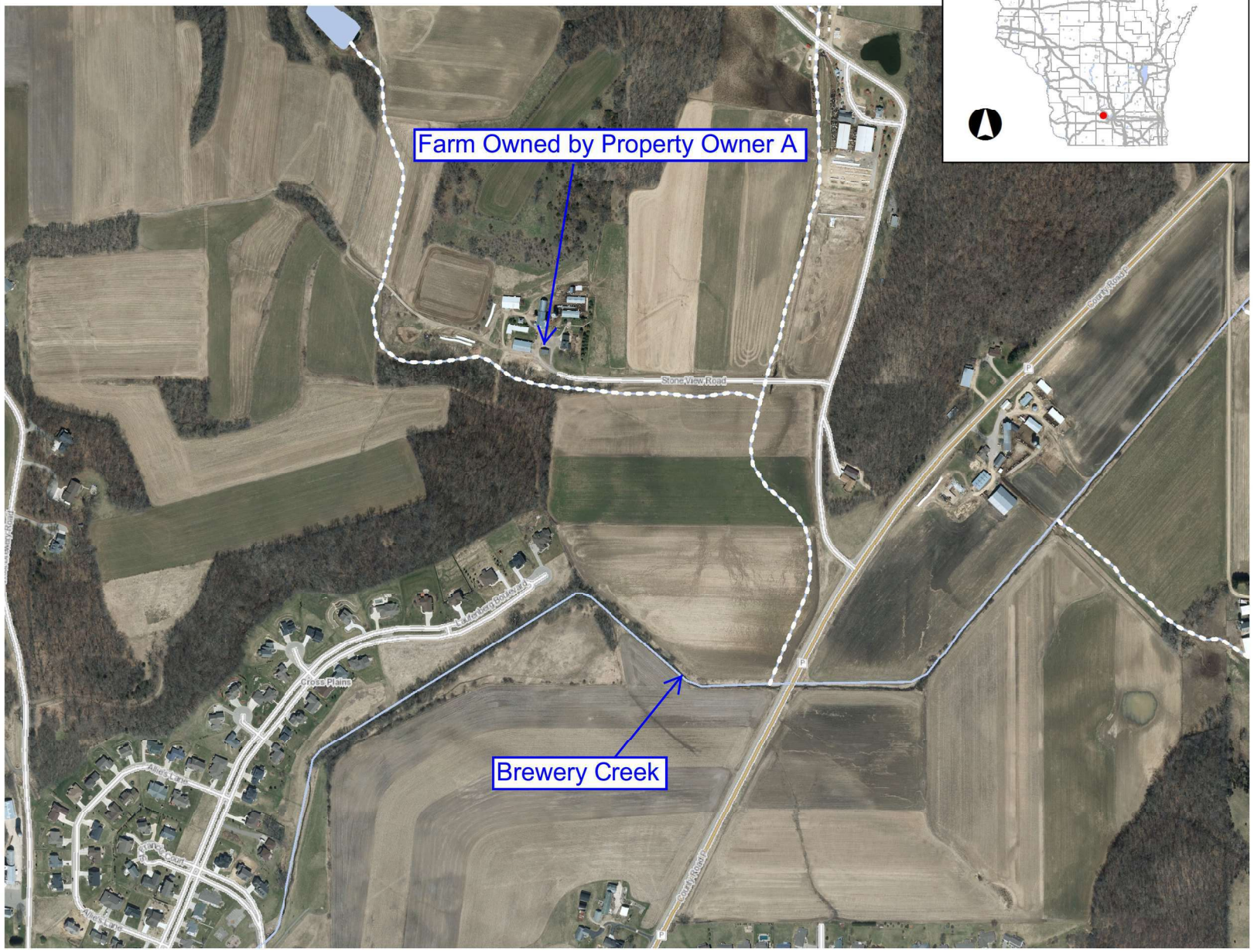
Aerial Photo of Property Owner A's Farm



Legend

- Intermittent Streams
- 24K Hydrography Streams and Rivers
- 24K Hydrography Lakes and Open Water
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

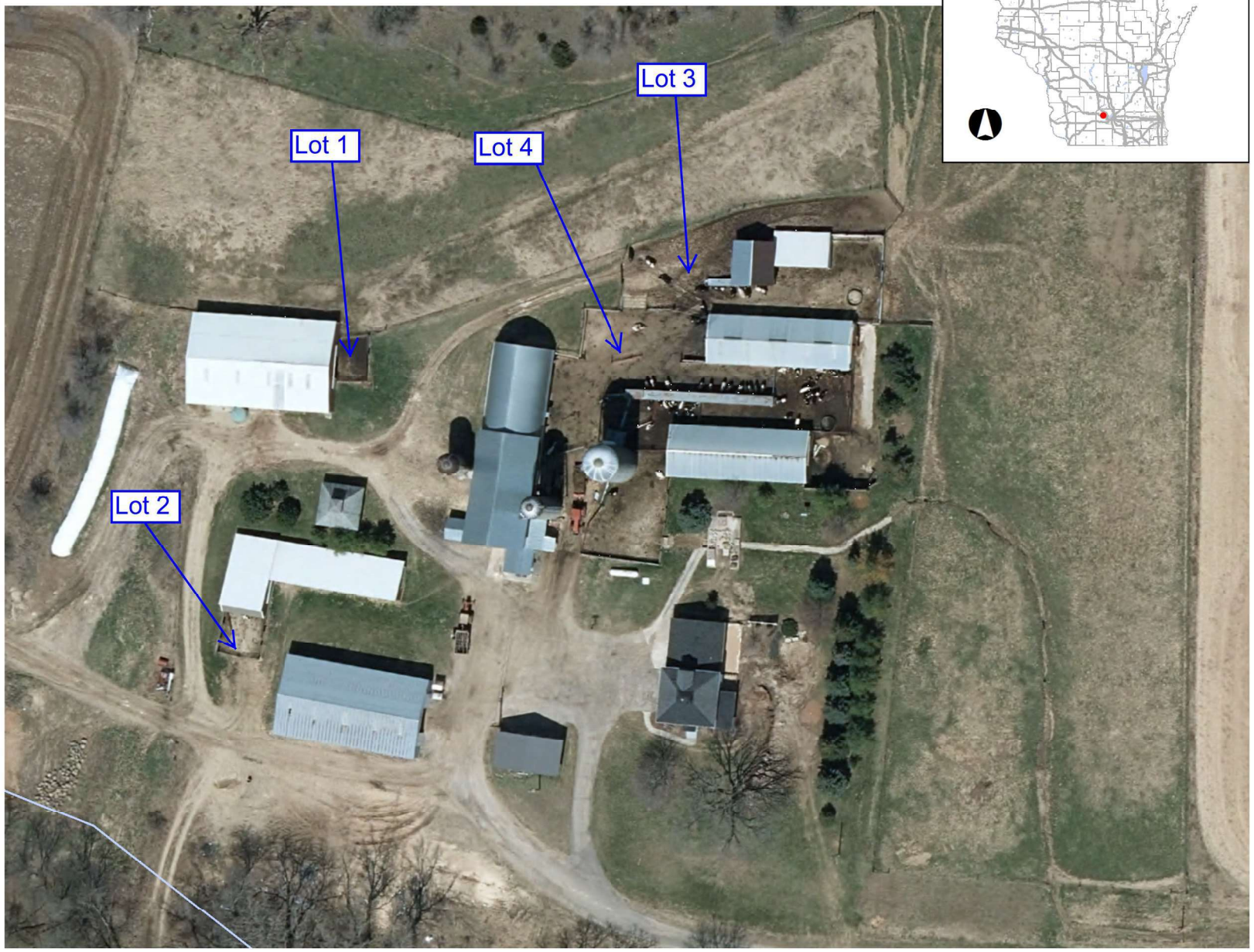
Notes

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920

Aerial Photo of Barnyard Owned by Property Owner A



Legend

- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

0.0 0 0.02 0.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 990

Appendix G

LAND&WATER RESOURCES DEPARTMENT

Laura M. Hicklin, Director
Joe Parisi, Dane County Executive

Administration • Land Conservation • Parks • Water Resource Engineering

April 18, 2019

Note from Town & Country Engineering:
The name of Landowner A have been redacted from this document for privacy reasons. Redactions are shown as follows: [redacted]

Village of Cross Plains
ATTN: Jerry Gray
2417 Brewery Rd
P.O. Box 97
Cross Plains, WI 53528

SUBJECT: **Notice of Potential Conservation Projects and Credit Generation**

Dear Mr. Gray,

On April 10, 2019 Dane County Land & Water Resources Department staff met with the Village of Cross Plains, Town and Country Engineering Inc. and [redacted] to identify any existing sources of total phosphorus being lost from the livestock production area of [redacted]'s Farm. The following is a summary of the sources that were identified along with calculated total phosphorus losses, using best available models, and recommended conservation practices that would generate total phosphorus credits.

1. **Barnyard**
   Four concrete lots were identified on the farmstead. Individual barnyard models (BARNY) were completed to quantify the current total phosphorus loses for each lot (Attachment A). Summary of phosphorus losses are as follows:
   - Lot 1 is 470 ft^2 in size and has twenty 800 pound animals. The current total phosphorus loss from this lot is 2.7 pounds per year.
   - Lot 2 is 550 ft^2 in size and has eighteen 500 pound animals. The current total phosphorus loss from this lot is 6.6 pounds per year.
   - Lot 3 is 2,850 ft^2 in size and has ten 1,400 pound animals. The current total phosphorus loss from this lot is 28.3 pounds per year.
   - Lot 4 is 14,180 ft^2 in size and has eighty five 1,400 pound animals. The current total phosphorus loss from this lot is 133.0 pounds per year.

   Total from Lots = 170.6 pounds of total phosphorus per year

   Recommended Conservation Practices
   Based on discussions with both [redacted] and the Village of Cross Plains parties have agreed that removal and relocation of the existing animals from the Barnyard facilities is appropriate to generate total phosphorus credits. [redacted] has indicated that he would like to keep up to five beef animals on Lot 3. Total phosphorus losses from Lot 3 under

this management scenario shows that 23.3 pounds will continue to be lost annually. Additional conservation practices may result in this loss being further reduced.

Accounting for the relocation of existing animals and the use of Lot 3 for five beef animals' results in 147.3 pounds of total phosphorus being reduced. Note that this does not account for trade ratios. Attachment A shows the total phosphorus loss for Lot 3 under the five beef animal scenario.

Available Pounds of Total Phosphorus from Lots Not Accounting for Trade Ratios = 147.3 pounds per year

2. **Gully Erosion**

Two gullies were identified during the walkover of the farmstead. One gully was located directly downslope of the feed storage area and outlets to an intermittent stream. This gully is identified as Gully #1.The second gully, identified as Gully #2, was located downslope of the barnyard and cuts across the existing pasture. This gully outlets to a road ditch that flows east for about 700 feet before discharging to an intermittent stream. See Attachment C for total phosphorus loss calculations.

- Gully #1 = 9.4 pounds of total phosphorus per year
- Gully #2 = 6.9 pounds of total phosphorus per year

Total from Gully Erosion = 16.3 pounds of total phosphorus per year

Recommended Conservation Practices

Recommended conservation practices to address these sources of phosphors include the design and construction of either a grassed or lined waterway (NRCS 412 or 468). Installation of either of these practices would result in a stable channel to convey the water to an outlet. Stabilization of the cannel would result in the gully erosion no longer occurring and a reduction of 16.3 total pounds of phosphorus being reduced.

Available Pounds of Total Phosphorus from Gully Erosion Not Accounting for Trade Ratios = 16.3 pounds per year

3. **Feed Storage Area**

The farmstead also has two feed storage areas containing silage in plastic bags. These areas are disturbed and have little vegetation with visible signs of runoff and erosion. Currently the Land & Water Resources Department is unaware of any models that are available for calculating phosphorus losses from feed leachate stored in silage bags. However, our staff determined that it was appropriate to use SNAP Plus in modeling current phosphorus losses from the site specifically as it relates to the disturbed area and soil loss. These calculated total phosphorus losses are likely underestimates of the phosphors losses since nutrients associated with the feed are not being accounted for in the model. Model results are in Attachment C.

- Storage Area 1 is 0.31 acres = 2.8 pounds of total phosphorus per year
- Storage Area 2 is 0.16 acres = 1.4 pounds of total phosphorus per year

Total from Feed Storage Areas = 4.2 pounds of total phosphorus per year

Recommended Conservation Practices

Assuming the number of animals on the farmstead will be reduced the continued use of the feed storage areas will likely no longer be needed. If this is the case one potential solution would be to abandon the storage sites and establish permanent vegetation (NRCS 342 – Critical Area Seeding). Should the permanent vegetation be restored the total phosphorus reductions from these areas would be 4.2 pounds.

Available Pounds of Total Phosphorus from Feed Storage Areas Not Accounting for Trade Ratios = 4.2 pounds per year

Should you have any questions regarding the information or calculations provided above please contact Kyle Minks at the Dane County Land & Water Resources Department. My contact information is below.

Sincerely,

Kyle Minks
Dane County Land and Water Resources
5201 Fen Oak Drive, Room 208
Madison, WI 53718
608-224-3675
Minks.kyle@countyofdane.com

Enclosure:
[redacted] Attachments

Cc: Ben Heidemann, Vice President – Town and Country Engineering, Inc.

Attachment A

EXISTING BUFFER P OUTPUT (Based on BARNY)

Farmer: [redacted] Planner/Designer: Lambert Date: 4/15/19

Barny 1

	Input	Output	
Closest City of similar climate:	1		1 Madison 2 Appleton 3 Wausau 4 Eau Claire
Paved lot area:	470		sq ft
Earth lot area:	0		sq ft
Animal Lot size:		470	sq ft
Is there a designed settling basin?	2		Yes= 1; No= 2
Animals on lot:	20 number		number
Type of animal:	1		(Dairy = 1;Beef=2)
Ave. Animal Weight:	800 lbs		lbs
Lot Use:	1		1= Heavy;2=Med;3= Light)

TRIBUTARY AREAS

Tributary area:		sq ft	sq ft
Runoff Curve Number:			← See RCN tab below for typical values
Roof Trib. area:		sq ft	

2.7 lbs P per year at downstream lot edge

Enter Existing Buffer Data:

Length:		ft
Width:		ft
Buffer area:		
Slope:		%
c value		For c values see table below

P Output: lb

EXISTING BUFFER P OUTPUT (Based on BARNY)

Farmer: [redacted] Planner/Designer: Lambert Date: 4/15/19

Barny 2

	Input	Output	
			1 Madison 2 Appleton
Closest City of similar climate:	1		3 Wausau 4 Eau Claire
Paved lot area:	550		sq ft
Earth lot area:	0		sq ft
Animal Lot size:		550	sq ft
Is there a designed settling basin?	2		Yes= 1; No= 2
Animals on lot:	18 number		number
Type of animal:	1		(Dairy = 1;Beef=2)
Ave. Animal Weight:	500 lbs		lbs
Lot Use:	1		1= Heavy;2=Med;3= Light)

TRIBUTARY AREAS

Tributary area:		sq ft	sq ft
Runoff Curve Number:			← See RCN tab below for typical values
Roof Trib. area:	375	sq ft	

6.6 lbs P per year at downstream lot edge

Enter Existing Buffer Data:

Length:		ft
Width:		ft
Buffer area:		
Slope:		%
c value		For c values see table below

P Output: lb

EXISTING BUFFER P OUTPUT (Based on BARNY)

Farmer: [redacted] Planner/Designer: Lambert Date: 4/15/19

Barny 3

	Input		
			1 Madison 2 Appleton
Closest City of similar climate:	1		3 Wausau 4 Eau Claire
Paved lot area:	2,850	sq ft	
Earth lot area:	0	sq ft	
Animal Lot size:		2,850 sq ft	
Is there a designed settling basin?	2	Yes= 1; No= 2	

Animals on lot:	10	number		number	
Type of animal:	1				(Dairy = 1;Beef=2)
Ave. Animal Weight:	1,400	lbs		lbs	
Lot Use:	2				1= Heavy;2=Med;3= Light)

TRIBUTARY AREAS

Tributary area:	900	sq ft		sq ft
Runoff Curve Number:	82		←	See RCN tab below for typical values
Roof Trib. area:	1,705	sq ft		

28.3 lbs P per year at downstream lot edge

Enter Existing Buffer Data:

Length:		ft
Width:		ft
Buffer area:		
Slope:		%
c value		For c values see table below

P Output: lb

EXISTING BUFFER P OUTPUT (Based on BARNY)

Farmer: [redacted] Planner/Designer: Lambert Date: 4/15/19

Barny 4

	Input		
			1 Madison 2 Appleton
Closest City of similar climate:	1		3 Wausau 4 Eau Claire
Paved lot area:	14,180	sq ft	
Earth lot area:	0	sq ft	
Animal Lot size:		14,180 sq ft	
Is there a designed settling basin?	2	Yes= 1; No= 2	

Animals on lot:	85	number		number	
Type of animal:	1				(Dairy = 1;Beef=2)
Ave. Animal Weight:	1,400	lbs		lbs	
Lot Use:	1				1= Heavy;2=Med;3= Light)

TRIBUTARY AREAS

Tributary area:	1,065	sq ft		sq ft
Runoff Curve Number:	98		←	See RCN tab below for typical values
Roof Trib. area:	4,515	sq ft		

133.0 lbs P per year at downstream lot edge

Enter Existing Buffer Data:

Length:		ft
Width:		ft
Buffer area:		
Slope:		%
c value		For c values see table below

P Output: lb

EXISTING BUFFER P OUTPUT (Based on BARNY)

Farmer: [redacted] Planner/Designer: Lambert Date:

Barny 3 with Beef

	Input		
			1 Madison
			2 Appleton
Closest City of similar climate:	1		3 Wausau
			4 Eau Claire
Paved lot area:	2,850	sq ft	
Earth lot area:	0	sq ft	
Animal Lot size:		2,850 sq ft	
Is there a designed settling basin?	2	Yes= 1; No= 2	

Animals on lot:	5	number		number	
Type of animal:	2				(Dairy = 1;Beef=2)
Ave. Animal Weight:	1,400	lbs		lbs	
Lot Use:	3				1= Heavy;2=Med;3= Ligh

TRIBUTARY AREAS

Tributary area:	900	sq ft		sq ft
Runoff Curve Number:	82		←	See RCN tab b for typical value
Roof Trib. area:	1,705	sq ft		

23.3 lbs P per year at downstream lot edg

Enter Existing Buffer Data:

Length:		ft
Width:		ft
Buffer area:		
Slope:		%
c value		For c values see table below

P Output: lb

Attachment B

Gully#	A	B	C	D	E	F	G	H	I	J	Phosphorus Reduction (pounds)
#1	2.5	3.0	1.5	150	95	5	3.4	67	8.0	1.17	9.36
#2	2.5	3.5	1.75	270	95	20	4.4	128	4.2	1.65	6.93
Total											16.3

SOIL LOSS FROM GULLY = A x [(B + C) / 2] x D x E ÷ 2000 (pounds/ton) ÷ F

INITIAL SURFACE TOTAL PHOSPHORUS = $[13 + (2.7 \times G) + (0.03 \times H)]^2 \times 0.002$ (lbs/ton).

PHOSHORUS REDUCTION = I x J

A = Channel Depth (feet)

B = Top Channel Width (feet)

C = Bottom Channel Width (feet)

D = Channel Length (feet)

E = Soil Weight (pounds/feet^3)

F = Formation Time (years)

G = organic matter % from soil test

H = soil test P (ppm)

I = Soils Loss from Gully (tons/year)

J = Initial Surface Total Phosphorus (pounds/ton of soil)

Attachment C

NM3: Field Data and 590 Assessment Plan

Reported For	Feed Storage Area
Printed	2019-04-17
Plan Completion/Update Date	2019-04-17
SnapPlus Version 18.1 built on 2019-01-08	
H:\LCD\Projects\Cross Plains\[redacted]Feed Storage Area.snapDb	

Prepared for:
Feed Storage Area
attn:Feed Storage Area

Field Data: 0 Total Acres Reported.

Field Name	SubFarm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	Contourf Filters	Irrig	Tiled	Rotation	Tillage	Report Period	Field "T" t/ac	Rot Avg Soil Loss t/ac	SCI	Rot Avg PI	Soil Test P ppm	Rot P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
Storage Area 1				0.3	Dane	KIDDER KrE2	8	60	6.1 - 12	1001 - 5000	No / No	No	No	Pdl-Pdl	None-None	2019-2020	5	7.9	-0.3	9	67	0	0
Storage Area 2				0.1	Dane	KIDDER KrE2	8	60	6.1 - 12	1001 - 5000	No / No	No	No	Pdl-Pdl	None-None	2019-2020	5	7.9	-0.3	9	67	0	0

Crop Abbreviations	
Abbreviation	Crop
Pdl	Pasture, dry lot, exercise area

Tillage Abbreviations	
Abbreviation	Tillage
None	None

Site Photos

Lot 1

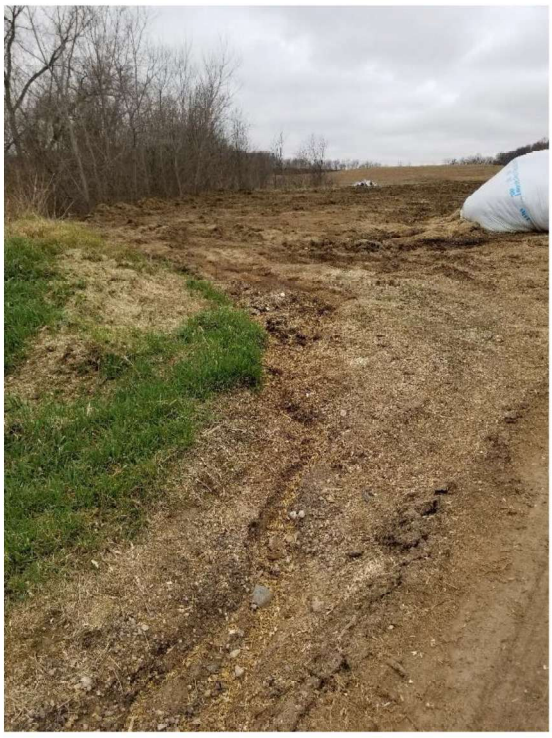
Lot 2

Lot 3

Lot 4

Barnyards

Gully #1



Gully #2

Storage Area 1

Storage Area 2

Appendix H

Photographs of Barnyard Area of Farm Owned by Landowner A

Photographs of Barnyard Area of Farm Owned by Landowner A

Photographs of Barnyard Area of Farm Owned by Landowner A

Photographs of Barnyard Area of Farm Owned by Landowner A

Appendix I

From: Garbe, Amy M - DNR [mailto:Amy.Garbe@wisconsin.gov]
Sent: Thursday, March 28, 2019 4:14 PM
To: Ben Heidemann <ben@tcengineers.net>; Evan Chambers <echambers@tcengineers.net>
Subject: Cross Plains WQT Follow-up Clarification

Hello,

I was able to confer with the other trading coordinators after our discussion on Cross Plains today.

1) Cattle – it is not necessary to sell the cattle outside of the watershed to generate credits. If the farmer was going to move the animals to a different field/barnyard than additional conversations would need to take place to make sure the pollutant isn't just being "shifted" to a different area. In the case of the cows being sold and the barnyard going out of production, no further tracking of the animal is needed and no special selling requirements are needed
2) Uncertainty factor – the Village of Hawkins received an uncertainty factor of 1 due to going to perennial vegetation. A similar uncertainty factor can be applied here; however, it will ultimately depend on what the final land use will be and the details surrounding the actual abandoning of the barnyard. There is a potential that it could go up to an uncertainty factor of 2.

Let me know if you have any other questions.

Thanks,

Amy Garbe

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Amy Garbe, P.E.
Wastewater Engineer
Wisconsin Department of Natural Resources
South Central Region
141 NW Barstow St Rm 180
Waukesha, WI 53188
Phone: (262) 574-2135
Amy.Garbe@wisconsin.gov

Appendix J

Water Quality Trading Agreement or Certification to be Provided

Appendix K

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Village of Cross Plains	WI- 0020788-09-0	

Facility Address	City	State	ZIP Code
100 Main Street (USH 14)	Cross Plains	WI	53528

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jerry Gray	100 Main Street (USH 14)	Cross Plains	WI	53528

Project Name
Cross Plains WWTP Phosphorus Water Quality Trading Plan

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		Removal of Livestock from Barnyard Area of Farm	147.3	1.2	BARNY Computer Model

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Dane	Brewery Creek	004/0807-352-8030-0	Total Phosphorus

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Brett Schitt	9/26/19

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	Date Signed
Jerry Gray VP CP	9/24/19

Leave Blank – For Department Use Only

Date Received		Trade Docket Number
Entered in Tracking System ☐ Yes	Date Entered	Name of Department Reviewer

Appendix L

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

Notification of Water Trade Agreement Termination

Form 3400-209 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Village of Cross Plains	WI- 0020788-09-0	

Facility Address	City	State	ZIP Code
100 Main Street (USH 14)	Cross Plains	WI	53528

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Jerry Gray	100 Main Street (USH 14)	Cross Plains	WI	53528

Project Name
Cross Plains WWTP Phosphorus Water Quality Trading Plan

Credit Generator Information

Credit generator type (select all that apply):

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

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

Amount of trading credit being terminated	Effective date of termination

Reason for termination

Is this agreement being updated or replaced?

- ◯ Yes
- ◯ No
- ◯ Unsure

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

- ◯ Yes; Name: _____
- ◯ No
- ◯ Unsure

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed