

Permit Fact Sheet

General Information

Permit Number	WI-0028363-11-0
Permittee Name and Address	SPRING GREEN GOLF CLUB SANITARY DISTRICT #2 1704 South Springs Drive, Spring Green, WI 53588
Permitted Facility Name and Address	Spring Green Golf Club Sanitary Dist #2 WWTF CTH "C", NEQ, NEQ, SEC 25, T8N, R3E, WYOMING TWP, IOWA COUNTY
Permit Term	October 01, 2026 to September 30, 2031
Discharge Location	North Bank of unnamed tributary, approximately 150 feet north of County Road "C" and 0.6 miles west of County Road "C" and St. Hwy 23 intersection. SE ¼ of the NE ¼ of Section 25, T8N, R3E, in the Village of Spring Green in Iowa County
Receiving Water	Unnamed Tributary of Lowery Creek in Otter and Morrey Creeks Watershed of Lower Wisconsin River Basin in Iowa County
Stream Flow (Q _{7,10})	Unnamed Tributary: 0 cfs Lowery Creek: 2.4 cfs
Stream Classification	Limited Aquatic Life (LAL)
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.0893 MGD
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Spring Green Golf Club Sanitary District #2 WWTF provides secondary treatment to domestic wastewater generated in the Spring Green Golf Club Sanitary District service area. Treatment units include mechanical screening, oxidation ditch and covered circular final clarifier secondary treatment, seasonal chlorine contact disinfection, and dechlorination. A ferric chloride feed system installation was completed in September of 2024 for treatment of phosphorus and Water Quality Trading will be used to offset the remainder of phosphorus in excess of the limit. The effluent discharges to an

unnamed tributary of Lowery Creek. Sludge produced is stored in an on-site liquid storage tank and sent to another permitted facility for final treatment and disposal. The facility is designed to treat an average daily flow of 0.0893 MGD.

Substantial Compliance Determination

Enforcement During Last Permit:

A notice of noncompliance (NON) dated August 17, 2022, was issued for failure to comply with submittal requirements. A NON dated July 17, 2023, was issued for failure to comply with the August 17, 2022, NON. A NON dated September 4, 2025, was issued for effluent limit, under reporting, and standard requirement violations which occurred in 2023, 2024, and 2025. The facility has completed all previously required actions as part of the enforcement process.

After a desktop review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on October 15, 2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Kenzie Ostien, Wastewater Engineer on July 22, 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	0.014 MGD (Apr. 2021 – Aug. 2025 Average)	Influent: 24-hour flow proportional composite samples are drawn from the headworks channel after influent flow monitoring in the bar screen room. Flow monitoring is completed using an ultrasonic flow meter and Parshall flume.
001	N/A – Effluent flow not monitored in previous permit term	Effluent: 24-hour flow proportional composite samples are drawn from the final clarifier effluent line as it enters the chlorine contact tank. Grab samples are collected at the end of the chlorine contact tank. Flow monitoring is completed using an ultrasonic flow meter and Parshall flume.
002	N/A – Sludge hauled to another facility	Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge storage tank.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
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.

- BOD – Sample frequency increased.
- Total Suspended Solids – Sample frequency increased.

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. Sample frequency of BOD and total suspended solids increased from 2x/week to 3x/week as this is the standard for a facility of this size.

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	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	3/Week	See Table	Look up the variable ammonia limit from the ‘Variable Ammonia Limitation’ table and report

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	3/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	55 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	17 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	24 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.7 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
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.
Chlorine, Total Residual	Daily Max	19 ug/L	Daily	Grab	May through September
Chlorine, Total Residual	Weekly Avg	7.3 ug/L	Daily	Grab	May through September
Chlorine, Total Residual	Monthly Avg	7.3 ug/L	Daily	Grab	May through September
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring upon permit reissuance. Limit effective per the Copper Effluent Limitations Schedule.
Copper, Total Recoverable		lbs/day	Monthly	Calculated	Monitoring upon permit reissuance. Limit effective per the Copper Effluent Limitations Schedule.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Hardness, Total as CaCO ₃		mg/L	Monthly	24-Hr Flow Prop Comp	Sample shall be collected on the same day as copper samples.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only in 2030
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level.
Phosphorus, Total		lbs/day	3/Week	Calculated	Report daily mass discharged using Equation 1a. in the Water Quality Trading (WQT) section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2c. in the Water Quality Trading (WQT) section. Available TP Credits are specified in Table 2 and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) section. Value entered on the last day of the month.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Computed Compliance (TP)	6-Month Avg	0.056 lbs/day	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 3b. in the Water Quality Trading (WQT) section. Compliance with the six-month average limit is evaluated at the end of the six-month period on June

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					30 and Dec 31.
WQT Credits Used (TP)	Annual Total	22.87 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed in the permit.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section in the permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section in the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring Section in the permit. 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) permit sections for monitoring dates and WET requirements.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) permit sections for monitoring dates and WET requirements.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.

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** – Effluent flow rate monitoring included in this permit.
- **BOD, Total Suspended Solids, and Ammonia** – Sample frequency increased to the standard for a facility of this size.
- **pH and DO** – Sample frequency increased to the minimum for a facility of this size.
- **E. coli** – Fecal coliform monitoring and limits have been replaced with *Escherichia coli* (*E. coli*) monitoring and limits.
- **Copper** – Monitoring included. Limits effective September 30, 2031, as per the Copper Effluent Limitations Schedule.
- **Hardness** – Monitoring included to coincide with copper monitoring.
- **Chloride**- Sampling year updated for this permit term.
- **Phosphorus** – MDV phosphorus parameters replaced by WQT parameters to enable use of WQT credits during this permit term.
- **Acute and Chronic WET** – Three acute and three chronic WET tests will be required throughout the permit term.
- **PFOS and PFOA** – Monitoring once every two months in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.

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 **July 22, 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. In this permit term, BOD, total suspended solids, and ammonia sample frequency were increased to 3x/week, which is the standard for a facility of this size. pH and DO were increased to 5x/week, which is the minimum for a facility of this size.

Flow: Section NR 108.06(4)(b), Wis. Adm. Code, requires all permittees provide adequate flow measurement and recording equipment to measure the volume of effluent discharged from their facility and to report it to the department at the frequency specified in the permit.

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. Spring Green Golf Club Sanitary District #2 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. *E.coli* monitoring requirements and limits are effective at the permit effective date.

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. Whenever chlorine is used for disinfection or other uses, the limitations and monitoring requirements for residual chlorine shall apply. A dichlorination process shall be in operation whenever chlorine is used.

Copper: Acute and chronic copper toxicity criteria for the protection of aquatic life are defined in ch. NR 105, Wis. Adm. Code, and water quality based effluent limitations (WQBELs) are calculated in accordance with the procedures of s. NR 106.06, Wis. Adm. Code. Copper monitoring results from the year 2024 were analyzed and the effluent data show that concentration and mass limits as well as monthly monitoring are required. Monitoring is required at permit effective date. A schedule has been provided for the permittee to obtain compliance with copper limits by September 30, 2031. If required compliance actions indicate that limitations are no longer needed, the permittee may request a permit modification to remove the limits. This modification will require a 30-day public notice. An alternative wet weather mass limit is included in accordance with s. NR 106.07(9), Wis. Adm. Code and applies when the dry weather mass limit has been exceeded and the facility demonstrates that the exceedance occurred during a wet weather event.

Hardness: Monthly monitoring of hardness as calcium carbonate (CaCO₃) to coincide with copper monitoring is required at permit effective date because of the relationship between hardness and copper toxicity.

Chloride: Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. If the permittee's effluent data shows that a calculated WQBEL for chloride cannot be met, then the permit will include a chloride effluent limitation. The permittee's effluent data shows concentrations below the calculated WQBELs for chloride, therefore no effluent limits are needed at this time. Chloride monitoring is included in the year 2030 to ensure 11 sample results are available at the next permit reissuance to meet data requirements of s. NR 106.85, 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 Unnamed Tributary of Lowery Creek is 0.075 mg/L. In this case, the WQBEL is 0.225 mg/L (monthly average), 0.075 mg/L & 0.056 lbs/day (6-month average). For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.225 mg/L). This final effluent limit was derived from and complies with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. The current limit of 1.0 mg/L will be retained in the permit to serve as a Minimum Control Level not to be exceeded at the outfall location.

The wastewater treatment facility is not able to meet the WQBEL. This permit authorizes the use of trading as a tool to demonstrate compliance with the phosphorus WQBELs. This permit includes terms and conditions related to the Water Quality Trading Plan (WQT-2026-0020) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Sanitary District is implementing conservation cover and prescribed grazing on agricultural lands. The WQT Plan proposes the generation of 22.87 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 in the permit through the authority under s. 283.55(1)(e), Wis. Stats. Testing is required as outlined in the permit.

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>. WET testing is used to measure and control the discharge of toxic materials

that may be harmful to aquatic life. Three acute and three chronic tests completed in rotating quarters to gather seasonal data are recommended as outlined in the permit.

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the PFOS + PFOA sludge result for this facility was greater than 20 ug/kg. For this reason, monitoring is required.

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

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

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002		Liquid				
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	Monitoring only required if land application occurs.
Nitrogen, Ammonium (NH ₄ -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	January through December 2028
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	January through December 2028
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					information.
PFAS Dry Wt			Once	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**- Sampling year updated.
- **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 Copper Effluent Limitations

This compliance schedule requires the permittee to achieve compliance by the specified date. See the permit for copper effluent limitations.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of copper with conclusions regarding compliance. When 11 or more representative results for copper have been provided to the Department, the permittee may request that the Department make a determination of the need for limits under s. NR 106.05, Wis. Adm. Code.	10/01/2027

See "Potential Removal of Effluent Limitations for Copper" in the Surface Water section of this permit for details.	
Action Plan: Submit an action plan for complying with the effluent limitations for copper. If construction is required, include plans and specifications with the submittal.	10/01/2028
Initiate Actions: Initiate actions identified in the plan.	10/01/2029
Progress Report: The permittee shall submit a progress report on achieving compliance with the effluent limitations for copper	10/01/2030
Complete Actions: Complete actions necessary to achieve compliance with the copper effluent limitations.	08/01/2031
Achieve Compliance: The permittee shall achieve compliance with the effluent limitations for copper.	09/30/2031

4.1.1 Explanation of Schedule

The proposed permit includes copper limitations for the first time. Pursuant to s. NR 106.117, Wis. Adm. Code, the department may include a compliance schedule to meet new water quality based effluent limits when the permittee cannot comply with the new limits immediately. The schedule allows the permittee the first year of the permit term to collect additional copper effluent data to determine the need for copper limits. If copper monitoring demonstrates that copper limits are not needed, the copper limits may be removed from the permit through a permit modification with public notice. If the data show copper limits are needed, the schedule specifies actions the permittee must take to comply with the copper limits.

4.2 Water Quality Trading (WQT) Annual Report

Required Action	Due Date
Annual WQT Report: Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include: The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance; The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source; Results of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports.	01/31/2028
Annual WQT Report #2: Submit an annual WQT report that shall cover the previous year.	01/31/2029

Annual WQT Report #3: Submit an annual WQT report that shall cover the previous year.	01/31/2030
Annual WQT Report #4: Submit the 4th annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	01/31/2031
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.	

4.2.1 Explanation of Schedule

Reports are required that include the following information:

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

4.3 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule.

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of 2027. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times (\$54.99 per pound)] or \$640,000, whichever is less. The calculation only applies for months January – September of 2026. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The payment verification form is due by the specified Due Date. Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is \$54.99	03/01/2027

4.3.1 Explanation of Schedule

Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce nonpoint sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal \$54.99 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

4.4 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	10/01/2027
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 approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	10/01/2028

4.4.1 Explanation of Schedule

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. 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.

Other Comments

None.

Attachments

Water Quality Based Effluent Limits dated July 22, 2026

WQT Conditional Approval Letter dated July 6, 2026

Water Quality Trading Plan dated June 30, 2026

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: July 23, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: July 22, 2026

TO: Jennifer Jerich – SCR/Fitchburg

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Spring Green Golf Club Sanitary District #2
Wastewater Treatment Facility
WPDES Permit No. WI-0028363-11-0

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 Spring Green Golf Club Sanitary District #2 in Iowa County. This municipal wastewater treatment facility (WWTF) discharges to the Unnamed Tributary of Lowery Creek, located in the Otter/Morrey Creek Watershed (LW11) in the Lower Wisconsin River Basin.

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

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			30 mg/L	20 mg/L		2,3
TSS			30 mg/L	20 mg/L		2,3
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2,3
Ammonia Nitrogen						
May – October	Variable		17 mg/L	6.7 mg/L		2,4,5
November – April	Variable		55 mg/L	24 mg/L		
Bacteria						
Final Limit				126 #/100 mL		6
<i>E. coli</i>				geometric mean		
Residual Chlorine						
May – September	19 µg/L		7.3 µg/L	7.3 µg/L		2, 4
Copper						
Concentration Limit	34 µg/L		21 µg/L	21 µg/L		4,7
Mass Limit	0.15 lbs/day		0.020 lbs/day	-		
Wet Weather Mass Limit	-		0.038 lbs/day	-		
Hardness						8
Chloride						9
Phosphorus						
WQT Limit				1.0 mg/L		10
Final WQBEL				0.225 mg/L	0.075 mg/L	
Mass Limit					0.056 lbs/day	
TKN, Nitrate+Nitrite, and Total Nitrogen						11
Acute WET						12,14

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Chronic WET						13,14

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
4. 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.
5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits – LAL

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	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	5.0
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

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. These are the WQBELs for copper. An alternative wet weather limit would also be needed in the permit. The wet weather mass limit applies when the dry weather mass limit is exceeded and the facility demonstrates to the Department the exceedance occurred during a wet weather event.
8. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits for copper based on acute toxicity criteria.
9. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
10. Previously, Spring Green Golf Club Sanitary District #2 previously had an MDV limit for phosphorus and have applied for a Water Quality Trading Limit.
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 (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
12. Three acute WET tests throughout the permit term is recommended. 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. Three chronic WET tests throughout the permit term is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 19%. 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%, 30%, 10%, 3% & 1%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from unnamed tributary to Lowell Creek.

14. Sampling WET concurrently with any chemical-specific toxic substances is recommended. WET tests should be done in rotating quarters, to collect seasonal information about this discharge.

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 (3) – Narrative, Map, Site Map & Thermal Table

PREPARED BY: Zainah Masri, Water Resources Engineer *Zainah Masri*

APPROVED BY: *Diane Figiel* Date: 07/22/2026
Diane Figiel, PE,
Water Resources Engineer

E-cc: Kenzie Ostien, 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

**Water Quality-Based Effluent Limitations for
Spring Green Golf Club Sanitary District #2 Wastewater Treatment Facility**

WPDES Permit No. WI-0028363-11-0

Prepared by: Zainah Masri – WY/3

PART 1 – BACKGROUND INFORMATION

Facility Description

The Spring Green Golf Club Sanitary Dist #2 WWTF provides secondary treatment to domestic wastewater generated in the Spring Green Golf Club Sanitary District service area. Treatment units include bar screening, chemical addition for phosphorus removal, oxidation ditch and covered circular final clarifier secondary treatment, seasonal chlorine contact disinfection, and dechlorination. The effluent discharges to an unnamed tributary of Lowery Creek. Sludge produced is stored in an on-site liquid storage tank and sent to another permitted facility for final treatment and disposal. The facility is designed to treat an average daily flow of 0.089 MGD.

In March of 2024 the non-functioning mechanical screen was removed and in September of 2024 the ferric chloride feed system installation was completed.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD ₅			30 mg/L	20 mg/L		1,2
TSS			30 mg/L	20 mg/L		1,2
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1,2
Ammonia Nitrogen						
May – October	Variable		17 mg/L	6.7 mg/L		3,4
November – April	Variable		55 mg/L	24 mg/L		
Bacteria						
Interim Limit				400 #/100 mL		5,6
Fecal Coliform				geometric mean		
Final Limit				126 #/100 mL		
<i>E. coli</i>				geometric mean		
Residual Chlorine						
May - September	19 µg/L		7.3 µg/L	7.3 µg/L		4
Copper						7
Chloride						7

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Phosphorus LCA HAC Final				5.0 mg/L 1.0 mg/L 0.225 mg/L	0.075 mg/L 0.056 lbs/day	8,9
TKN, Nitrate+Nitrite, and Total Nitrogen						10

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. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values is included in the permit in place of a single limit. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	83	$7.0 < \text{pH} \leq 7.1$	51	$8.0 < \text{pH} \leq 8.1$	11
$6.1 < \text{pH} \leq 6.2$	82	$7.1 < \text{pH} \leq 7.2$	46	$8.1 < \text{pH} \leq 8.2$	8.8
$6.2 < \text{pH} \leq 6.3$	80	$7.2 < \text{pH} \leq 7.3$	40	$8.2 < \text{pH} \leq 8.3$	7.3
$6.3 < \text{pH} \leq 6.4$	78	$7.3 < \text{pH} \leq 7.4$	35	$8.3 < \text{pH} \leq 8.4$	6.0
$6.4 < \text{pH} \leq 6.5$	75	$7.4 < \text{pH} \leq 7.5$	31	$8.4 < \text{pH} \leq 8.5$	5.0
$6.5 < \text{pH} \leq 6.6$	72	$7.5 < \text{pH} \leq 7.6$	26	$8.5 < \text{pH} \leq 8.6$	4.1
$6.6 < \text{pH} \leq 6.7$	69	$7.6 < \text{pH} \leq 7.7$	22	$8.6 < \text{pH} \leq 8.7$	3.4
$6.7 < \text{pH} \leq 6.8$	65	$7.7 < \text{pH} \leq 7.8$	19	$8.7 < \text{pH} \leq 8.8$	2.8
$6.8 < \text{pH} \leq 6.9$	60	$7.8 < \text{pH} \leq 7.9$	16	$8.8 < \text{pH} \leq 8.9$	2.4
$6.9 < \text{pH} \leq 7.0$	56	$7.9 < \text{pH} \leq 8.0$	13	$8.9 < \text{pH} \leq 9.0$	2.0

4. 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.
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. A compliance schedule is in the current permit to meet the final *E.coli* WQBEL by April 30, 2025.
7. Monitoring only for copper and chloride from January 2024 – December 2024.
8. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 5.0 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 1.0 mg/L can be met. The final WQBELs remain at 0.225 mg/L as a monthly average and 0.075 mg/L as a six-month average, as well as a respective mass limit.
9. A compliance schedule is in the current permit to meet the highest attainable condition (HAC) limit for phosphorus by March 31, 2025.

10. 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).

Receiving Water Information

- Name: Unnamed Tributary of Lowery Creek
- Waterbody Identification Code (WBIC): 1241450
 - Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Historically, the Unnamed Tributary of Lowery Creek has been considered as limited aquatic life (LAL) community for the purposes of calculating effluent limits. However, the Unnamed Tributary of Lowery Creek is not explicitly listed in ch. NR 104, Wis. Adm. Code, so therefore a site visit was necessary to make a determination. In September 2025, a biologist went to the unnamed tributary which was confirmed to be a LAL and will be proposed for addition to ch. NR 104. The proposed classification is addressed in a separate memo from the biologist.
 - Lowery Creek is located approximately 0.20 mile downstream of the Unnamed Tributary of Lowery Creek. Lowery Creek is classified as warm water sport fishery, non-public water supply for its lower 1.5 miles (downstream of the Taliesin Dam).
- Low Flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code:
 - Unnamed Tributary of Lowery Creek
7-Q₁₀ = 0 cfs (cubic feet per second)
7-Q₂ = 0 cfs
Harmonic Mean Flow = 0 cfs
 - Lowery Creek
7-Q₁₀ = 2.4 cfs
7-Q₂ = 3.27 cfs
Downstream low flows for Lowery Creek is estimated by using regression equations with a drainage area of 13.6 mi² and a base flow of 0.30 cfs.
- Hardness = 227 mg/L as CaCO₃. This value represents the geometric mean of data from September 2025 – October 2025 in the permit application.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None
- Impaired water status: The Unnamed Tributary to Lowery Creek upstream of the discharge was not assessed for impairment. The Unnamed Tributary to Lowery Creek downstream of the outfall and Lowery Creek are not listed as impaired. The Wisconsin River, located approximately 0.40 mile downstream, is listed as impaired for Mercury (contaminated fish tissue) and PCBs.

Effluent Information

- Design flow rate:
Annual average = 0.089 million gallons per day (MGD)
For reference, the actual average flow from January 2021 – January 2026 was 0.0141 MGD. *Please note that the average flow is the influent flowrate from outfall 701.*

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- Hardness = 227 mg/L as CaCO₃. This value represents the geometric mean of data from September 2025 – October 2025 in the permit application.
- Water supply: Private wells.
- Additives: In total Spring Green Golf Club SD #2 has 3 additives. The facility only included one additive in the permit application, and the other two were confirmed by the compliance engineer, that have the potential to be present in Outfall 001, However These additives are listed below:
 - Chlorine – Disinfection
 - Ferric Chloride – Phosphorus Removal
 - Sodium Bisulfate – Dechlorination
 - 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)
1/2/2024	14	5/2/2024	29	9/3/2024	9.6
2/6/2024	14	6/6/2024	12	10/3/2024	16
3/5/2024	14	7/2/2024	13	11/7/2024	3.6
4/2/2024	25	8/6/2024	11	12/5/2024	5.2
1-day P ₉₉ = 38 µg/L					
4-day P ₉₉ = 24 µg/L					

Chloride Effluent Data

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
3/26/2024	274	7/3/2024	123	10/15/2024	230
4/9/2024	241	7/23/2024	155	11/7/2024	148
4/23/2024	190	8/8/2024	174	12/12/2024	244
5/9/2024	216	9/17/2024	209		
6/18/2024	231	10/1/2024	207		
1-day P ₉₉ = 325 mg/L					
4-day P ₉₉ = 259 mg/L					

The following table presents the average concentrations and loadings at Outfall 001 from January 2021 – January 2026 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

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Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD ₅	4.1 mg/L*	-
TSS	6.1 mg/L	-
pH field	8.2 s.u.	-
Dissolved Oxygen	9.5 mg/L	-
Ammonia Nitrogen	0.39 mg/L*	-
Fecal Coliform	20 #/100 mL**	-
<i>E. coli</i>	13 #/100 mL**	-
Phosphorus	2.6 mg/L	0.13 lbs/day
Residual Chlorine	0.29 µg/L	-

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

** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

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

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

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

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

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

Where:

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

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Spring Green Golf Club Sanitary District #2 WWTF.

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 = 0 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Chlorine		19	19			2.3	4
Arsenic		340	640	68	<1.1		
Cadmium	227	74	74	15	<0.17		
Chromium	227	3,529	3,529	706	<1.5		
Copper	227	34	34			38	29
Lead	227	236	236	47	<5.4		
Nickel	227	939	939	188	5.1		
Zinc	227	247	247	49	22		
Chloride (mg/L)		757	757			325	274

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

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Chlorine		7.3	7.3			1.3
Arsenic		152	152	30	<1.1	
Cadmium	175	3.8	3.8	0.8	<0.17	
Chromium	227	259	259	52	<1.5	
Copper	227	21	21			24
Lead	227	61.84	61.8	12.4	<5.4	
Nickel	227	147	147	29	5.1	
Zinc	227	247	247	49	22	
Chloride (mg/L)		395	395			259

Attachment #1

* 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 = 0 cfs (1/4 of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880	880	176	<0.17
Chromium (+3)	8,400,000	8,400,000	1,680,000	<1.5
Lead	2,240	2,240	448	<5.4
Nickel	110,000	110,000	22,000	5.1

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0 cfs (1/4 of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13	13	2.7	<1.1

Conclusions and Recommendations

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

Total Residual Chlorine – Because chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, “When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L.” Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 19 µg/L is required**. The limit is set equal to criteria because there is no dilution in the stream. Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. **The weekly average effluent limitation of 7.3 µg/L** should be included in the permit because it is more restrictive than the daily maximum limit. Additional limits are discussed in the expression of limits section of this memo.

Copper – Considering available effluent data from January 2024 – December 2024, the 1-day P₉₉ concentration is 38 µg/L, with a maximum concentration of 29 µg/L. The maximum effluent concentration and the 1-day P₉₉ of the effluent data exceed the calculated daily maximum limit, therefore concentration and mass limits, as well as monthly monitoring, are required.

The acute mass limitation of 0.15 lbs/day is based on the concentration limit and the peak daily design flow rate of 0.524 MGD (34 µg/L * 0.524 MGD * 8.34/1000) in accordance with s. NR 106.07(2)(a),

Wis. Adm. Code. The peak daily design flow was calculated using the “Work sheet for estimating maximum design flows for municipal WWTPs”.

The chronic mass limitation of 0.020 lbs/day is based on the concentration limit and the annual average design flow rate of 0.089 MGD ($21 \mu\text{g/L} \times 0.089 \text{ MGD} \times 8.34/1000$) in accordance with s. NR 106.07(2)(a), Wis. Adm. Code.”.

An alternative wet weather mass limit of 0.038 lbs/day ($21 \mu\text{g/L} \times 0.217 \text{ MGD} \times 8.34/1000$) **should also be included** in accordance with s. NR 106.07(9), Wis. Adm. Code. The peak weekly design flow was used to calculate the wet weather mass limit. The wet weather mass limit applies when the dry weather mass limit is exceeded, and the facility demonstrates to the Department the exceedance occurred during a wet weather event. The peak weekly design flow was calculated using the “Work sheet for estimating maximum design flows for municipal WWTPs”.

Quarterly hardness monitoring is also recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.

Chloride – Considering available effluent data from the January 2024 – December 2024 the 1-day P_{99} chloride concentration is 325 mg/L, and the 4-day P_{99} of effluent data is 259 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 Spring Green Golf Club 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 September 25, 2025 was 2.3 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. There is no data PFOS and PFOA monitoring currently available. Based on the type of discharge, the effluent flow rate, and the unknown levels of PFOS/PFOA in the source water **PFOS and PFOA monitoring is not recommended.**

The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

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

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

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 526 sample results were reported from January 2021 – January 2026. The maximum reported value was 9.0 s.u. (Standard pH Units). The effluent pH was 8.9 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 9.2 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 9.2 s.u. Therefore, a value of 9.0 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 9.0 s.u. into the equation above yields an ATC = 2.04 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-Q₁₀ receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	4.10
1-Q ₁₀	2.04

The 1-Q₁₀ method yields the most stringent limits for Spring Green Golf Club.

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

Daily Maximum Ammonia Nitrogen Limits – LAL

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	83	$7.0 < \text{pH} \leq 7.1$	51	$8.0 < \text{pH} \leq 8.1$	11
$6.1 < \text{pH} \leq 6.2$	82	$7.1 < \text{pH} \leq 7.2$	46	$8.1 < \text{pH} \leq 8.2$	8.8
$6.2 < \text{pH} \leq 6.3$	80	$7.2 < \text{pH} \leq 7.3$	40	$8.2 < \text{pH} \leq 8.3$	7.3
$6.3 < \text{pH} \leq 6.4$	78	$7.3 < \text{pH} \leq 7.4$	35	$8.3 < \text{pH} \leq 8.4$	6.0
$6.4 < \text{pH} \leq 6.5$	75	$7.4 < \text{pH} \leq 7.5$	31	$8.4 < \text{pH} \leq 8.5$	5.0
$6.5 < \text{pH} \leq 6.6$	72	$7.5 < \text{pH} \leq 7.6$	26	$8.5 < \text{pH} \leq 8.6$	4.1
$6.6 < \text{pH} \leq 6.7$	69	$7.6 < \text{pH} \leq 7.7$	22	$8.6 < \text{pH} \leq 8.7$	3.4
$6.7 < \text{pH} \leq 6.8$	65	$7.7 < \text{pH} \leq 7.8$	19	$8.7 < \text{pH} \leq 8.8$	2.8
$6.8 < \text{pH} \leq 6.9$	60	$7.8 < \text{pH} \leq 7.9$	16	$8.8 < \text{pH} \leq 8.9$	2.4
$6.9 < \text{pH} \leq 7.0$	56	$7.9 < \text{pH} \leq 8.0$	13	$8.9 < \text{pH} \leq 9.0$	2.0

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

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 January 2021 – January 2026.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	May – October	November – April
1-day P ₉₉	1.0	13
4-day P ₉₉	0.6	8.1
30-day P ₉₉	0.25	3.4
Mean*	0.11	1.3
Std	0.23	3.4
Sample size	142	124
Range	<0.02 - 2.7	<0.02 - 14

*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 – October	Variable	17 mg/L	6.7 mg/L
November – April	Variable	55 mg/L	24 mg/L

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

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Spring Green Golf Club permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

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

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 Spring Green Golf Club has phosphorus limits in effect that is equal to 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)

Attachment #1

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.

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Spring Green Golf Club is classified as limited aquatic life downstream from the point of discharge downstream to approximately 0.2 mile to the confluence with Lowery Creek where the classification changes. Lowery Creek is classified for warm water sport fishery uses downstream of the Taliesin Dam and therefore where the Unnamed Tributary to Lowery Creek converges with Lowery Creek.

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 Lowery 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 Unnamed Tributary for Lowery Creek

Qs = 100% of the 7-Q₂ of 3.8 cfs based on a regression equation for flow in Lowery Creek

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

Qe = effluent flow rate = .089 MGD = 0.138 cfs

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

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

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.0887 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.

Attachment #1

A review of all available in stream total phosphorus data from June 2018 – October 2025 in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in Lowery Creek at DS CTH-C (10050874) is 0.0762 mg/L, just upstream from the point of discharge to Lowery Creek.

In stream total phosphorus data upstream of the discharge is not available however the following data were considered in estimating the background phosphorus concentration:

SWIMS ID	10050874
Station Name	Monitoring station at Lowery Cr. DS CTH-C
Waterbody	Lowery Creek
Sample Count	44
First Sample	06/28/2018
Last Sample	10/14/2025
Mean	0.090 mg/L
Median	0.076 mg/L

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

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from January 2021 – January 2026.

Total Phosphorus Effluent Data

	Phosphorus mg/L (before April 01, 2025)	Phosphorus mg/L (after April 01, 2025)
1-day P ₉₉	9.1	1.1
4-day P ₉₉	5.6	0.7
30-day P ₉₉	3.8	0.46
Mean	3.0	0.36
Std	1.8	0.20
Sample size	436	87
Range	0.11 - 14	0.12 - 1.6

Reasonable Potential Determination

The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion and is currently using an MDV (multi-discharge variance) as a compliance option and have applied for water quality trading (WQT) as a compliance option in the reissued permit. Therefore, **the WQBELs are required to continue in the reissued permit per ss. NR 217.15 and 205.067(5), Wis. Adm. Codes.**

Limit Expression

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

Mass Limits

A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of an exceptional resource water, the Wisconsin River. **This final mass limit shall be $0.075 \text{ mg/L} \times 8.34 \times 0.089 \text{ MGD} = 0.056 \text{ lbs/day}$ expressed as a six-month average.**

Water Quality Trading Minimum Control Level

A WQT plan has been submitted as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the phosphorus WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but a MCL must be set as a limit not to be exceeded at the outfall location. **Therefore, the current 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 Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 °F.

Reasonable Potential

Based on the available discharge temperature data from June 2013 – September 2014 shown below, the maximum daily effluent temperature reported was 68 °F; therefore, no reasonable potential for exceeding the daily maximum limit of 86 °F; exists, and **no limits or monitoring are recommended.**

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	35	36	-	86

Attachment #1

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
FEB	34	34	-	86
MAR	36	36	-	86
APR	44	46	-	86
MAY	57	58	-	86
JUN	64	64	-	86
JUL	67	68	-	86
AUG	68	68	-	86
SEP	68	68	-	86
OCT	58	60	-	86
NOV	50	50	-	86
DEC	40	40	-	86

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 19%**, 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: 3.33

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

Where:

Q_e = annual average flow = 0.089 MGD = 0.140 cfs

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

$$Q_s = 25\% \text{ of } 7\text{-}Q_{10} \text{ cfs} = 2.4/4 = 0.60 \text{ cfs}$$

The receiving water flow rate for Lowery Creek was used because the unnamed tributary has been verified as a limited aquatic life community.

- 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.

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 = 19%. 0 Points
Historical Data	No data not available in the past 5 years 5 Points	No data not available in the past 5 years 5 Points
Effluent Variability	Little variability, with a history of BOD and Ammonia Nitrogen exceedances consistent WWTF operations. 5 Points	Same as Acute. 5 Points
Receiving Water Classification	< 4 mi to non-variance 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	Reasonable potential for limits for copper based on ATC; Ammonia nitrogen limit carried over from the current permit. Zinc, Chloride, Nickel detected. 8 Points	Reasonable potential for limits for copper based on CTC; Ammonia nitrogen limit carried over from the current permit. Zinc, Chloride, Nickel detected. 8 Points
Additives	3 additives; 1 biocide and 2 water quality conditioners added.	All additives used more than once per 4 days.

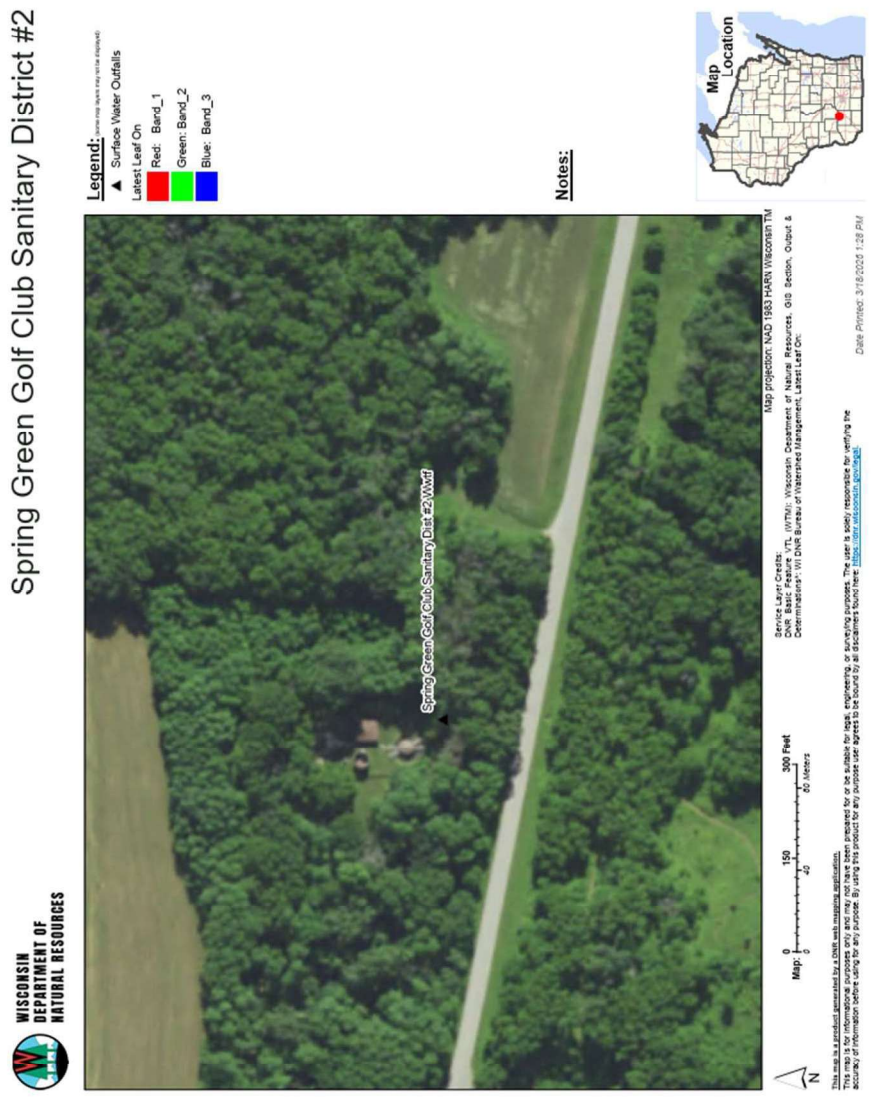
Attachment #1

	Acute	Chronic
	Permittee does have proper P chemical SOPs in place 5 Points	5 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:	28 Points	28 Points
Recommended Monitoring Frequency (from Checklist):	3 tests throughout the permit term	3 tests throughout the permit term
Limit Required?	No	No
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, 3 acute and 3 chronic WET test throughout the permit term in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. WET tests should be done in rotating quarters, to collect seasonal information about this discharge.

Site Map:

Attachment #2



Ammonia Nitrogen Calculations from the WQBEL Memo Dated August 19, 2015:

AMMONIA (as N) LIMITS		Spring Green Golf			
CLASSIFICATION:		LIMITED AQUATIC LIFE		WARMWATER	
EFFLUENT FLOW (mgd):		0.0893		0.0893	
EFFLUENT FLOW (cfs):		0.138		0.138	
MAX. EFFLUENT pH (s.u.):		7.90		7.90	
BACKGROUND INFORMATION:		<i>summer</i>	<i>winter</i>	<i>summer</i>	<i>winter</i>
7Q10 (cfs)		0	0	2.4	2.4
7Q2 (cfs)		0	0	3.27	3.27
Ammonia (mg/L)		0.06	0.12	0.06	0.12
Temperature (deg C)		23	3	23	3
pH (std. units)		8.21	7.97	8.21	7.97
% of river flow used:		100	25	100	25
Reference weekly flow:		0	0	2.4	0.6
Reference monthly flow:		0	0	2.7795	0.694875
CRITERIA (in mg/L):					
4-day Chronic (@ backgrd. pH):		16.68	87.18		
early life stages present				2.55	6.35
early life stages absent				2.55	10.31
30-day Chronic (@ backgrd. pH)		6.67	34.87		
early life stages present				1.02	2.54
early life stages absent				1.02	4.12
EFFLUENT LIMITS (in mg/L):					
Weekly average					
early life stages present				45.86	33.41
early life stages absent		16.68	87.18		54.57
Monthly average					
early life stages present				20.36	14.71
early life stages absent		6.67	34.87		24.26



July 6, 2026

Mark Baker
Commission President
1704 S Springs Drive
Spring Green, WI 53558

Subject: Spring Green Golf Club Sanitary District #2 WWTF - WPDES Permit WI-0028363
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Mark Baker:

The Department recently received a water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the Spring Green Golf Club Sanitary District #2 WWTF. The initial plan was received in September of 2025 and updated versions were received in May and June of 2026. Based on WDNR review, the final WQT Plan (dated June 2026) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes to utilize conservation cover and prescribed grazing on agricultural lands. 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 upon permit reissuance.

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-2026-0020

Year	Available Credits (lbs/yr) – Total
2026	22.87
2027	22.87
2028	22.87
2029	22.87
2030	22.87
2031	22.87

The Department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The Department has assigned the WQT plan a tracking number of WQT-2026-0020 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,

A handwritten signature in black ink that reads "BetsyJo Howe". The signature is written in a cursive, flowing style.

BetsyJo Howe
SCR WQT Coordinator
Wisconsin Department of Natural Resources

e-CC:

Richard Cates, Town of Wyoming Board
Sue Donaldson, Spring Green Golf Club Sanitary District
Sara Wilhelm, Iowa County Land Conservation Department
Laura James, WDNR
Kenzie Ostien, WDNR
Matt Claucherty, WDNR

Spring Green Golf Club Sanitary District #2 Water Quality Trading Plan for Phosphorus



Facility Address: 5230 Hwy C, Spring Green, WI 53588

Permit Number: WI-0028383-10-1

FID# 125002790

Lower Wisconsin

HUC 8 Code: 07070005

Lowery Creek

HUC 12 Code: 070700051203

September 30, 2025

Revised: June 30, 2026

Special thanks to:

Dick Cates, Lowery Creek Watershed Initiative & Town of Wyoming Chairman

Matt Claucherty, WI DNR

BetsyJo Howe, WI DNR

Sara Wilhelm, Iowa County Land Conservation

Katie Abbot, Iowa County Land Conservation

Lowery Creek Watershed Initiative

Patrick Michaels, TwinCrix Farm, Landowner

Erik Hagen, Savanna Institute, Landowner

Eric Cates, Cates Family Farm, Land Lessee

Danielle Pacha, Landowner

Driftless Area Land Conservancy



Map of Area

The subject area is in Iowa County, Town of Wyoming, Sections 01, 06, 25, 29-32.

Certification:

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

A handwritten signature in black ink, appearing to read "Mark Baker", is written over a light gray rectangular background.

Mark A Baker

Commission President
Spring Green Golf Club Sanitary District #2

1621 S Springs Dr
Spring Green, WI 53588
608-516-0685
Mark@Baker15.com



Spring Green Golf Club Sanitary District #2

Water Quality Trading Plan

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1. Summary

This Water Quality Trading Plan summarizes the Spring Green Golf Club Sanitary District #2 (District) plan to utilize Water Quality Trading (WQT) for compliance with the final total phosphorus limit as provided in the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit # WI-0028383-10-1 for the Wastewater Treatment Facility (WWTF) FID# 125002790.

Originating with the 2020 DNR Permit renewal, a phosphorus optimization plan schedule was outlined. An engineering study was conducted to evaluate different approaches. Two general approaches evolved from this evaluation: a chemical feed system and water quality trading.

A ferric chloride based chemical feed system (system) was designed to meet the Multi-Discharger Variance Interim Limit (1.0 mg/L) no later than March 31, 2025. This system went online during August 2024 (WDNR Project No. S-2023-0630). This system substantially reduced the effluent phosphorus, well below the limit 1.0 limit. Adjustments to the feed rate continue to take place as we learn more about overall system optimization and the effect of seasonal treatment volume patterns.

Water quality trading consideration was taken under the leadership of the Lowery Creek Watershed Initiative a program which is part of the Driftless Area Land Conservancy Lowery Creek Watershed initiative. This overlapped with the Town of Wyoming leadership of John Hess and Dick Cates who were responsible for the District until the appointment of a separate commission in October of 2023. The hard work of this engaged farmer/landowner group led to the commitment of landowners and lessees to implement conservation practices. This was undertaken without consideration of compensation by the District. This has come to fruition with the significant commitment to stewardship of the land found in our township. Formal agreements have been executed in June 2026. Many thanks go to Dick Cates for his decades-long commitment to his land, the land in the Township, and well beyond.

As shown in [Appendix 10](#) the Water Quality Trading Plan Summary and Best Management Practices (BMPs) implemented across three sites will generate credits to offset the phosphorous in the WWTF effluent after the implementation of the chemical feed system.

2. Background

a. Spring Green Golf Club Sanitary District #2

The District was formed September 1, 1988, by order of the Town of Wyoming Town Board. The district is a municipal corporation as permitted by Wisconsin State Statute Chapter 60, Subchapter IX Town Sanitary Districts. The district was formed in anticipation of the development of the resort and the residential areas that surround it. The WWTF was built by the developer of The Springs (now House on the Rock Resort and Golf Course) and transferred to the district on December 12, 1996. The WWTF capacity was based on the developers plan which almost 200 residential sites and additional facilities, much of which never materialized.

The district currently includes five commercial customers (Wintergreen, Taliesin Home, Taliesin Visitors Center, House on the Rock Resort and Golf Course, and American Players Theatre), 28 condominiums (Aspen Glen and Fairways), and 19 homes.

Volume has been steady to slightly declining over the past few years. The nature of the District's customer volume is highly seasonal (both commercial and residential). Beyond the addition of single-family homes (5-10 additional), there is likely little additional volume potential. Increased costs and an aging facility have resulted in two price increases in the past 3 years. The last increase was approximately 30%. This increase brings the district to break-even which includes a plan to replenish the reserve account, over several years, that was utilized to implement the chemical feed system and catch-up on facility maintenance. There are no full-time employees of the district. A contracted operator-in-charge, and resources from the Resort are used for sampling and monitoring. The commission is comprised of volunteers from the district's service customers. This independent commission was appointed by the Town Board in October of 2023.

The district uses an activated sludge plant located at 5230 Hwy C and accessed via an easement from the Wintergreen property. The wastewater treatment facility is comprised of a 20 acre parcel, an 800 sq. ft. control building with office, chemical room, blower room, influent channel/screen room in addition to a basement where the pumps are located. The two-ring 30' radius clarifier and 25' diameter, 20' tall sludge silo are adjacent to the control building. The plant was designed by MSA, Inc. in 1989. [See Appendix 9.](#)

b. Phosphorus Reduction and Water Quality Trading with Lowery Creek Watershed Initiative

The [Lowery Creek Watershed Initiative](#) (LCWI) was created in 2014 by a group of interested residents, farmers and organizations within this 8600 acre watershed. The Driftless Area Land Conservation (DALC) organization houses this initiative. DALC has purchased the Wintergreen property, and they are a major landowner and will have their offices within the watershed and district this year.

When the phosphorus compliance engineering study became visible to the Town of Wyoming Board (who had the responsibility for the district at that time), Dick Cates began to work on the potential of water quality trading. With an unknown final phosphorus (TP) limit in the future, and an active, much broader, initiative within the upstream watershed, the pursuit of TP reduction was logical. We are incredibly fortunate to have engaged and informed landowners who value multi-generational stewardship of the land and water.

The engaged property owners and lessees with leadership and participation of the LCWI began the process to gain commitment for implementing best management practices (BMPs) for TP reduction. Iowa County Land and Water Conservation and Wisconsin DNR Water Quality Program lead have been instrumental in informing the technical aspects of this plan.

There are several different BMPs including conversion from row crop to alfalfa and/or rotational grazing, conversion to grass or perennial cover, and conversion to orchard. These practices have been implemented as this plan was developed to offset the District's phosphorus output. This process was driven by Dick Cates with his Leadership in the Lowery Creek Watershed Initiative and work on the Town of Wyoming board. He worked with the various owners/farmers to gain their participation. They began these conservation BMPs without regard to any current or future remuneration for participating. They are long term stewards of the land and have committed to sustainable practices.

[See Appendix 8](#) for a map of trading credit generation sites, owners, fields, practices and credits generated.

c. Phosphorus Reduction and Ferric Chloride Chemical Feed (CF) Phosphorus Treatment

The following tables summarize the reported (estimated for August to December 2025) Discharge Monitoring Long Form Phosphorus Discharge. As you can see, the Chemical Feed. (ferric chloride system) implemented August 29, 2024, resulted in an 85% or greater reduction in effluent phosphorus.

The phosphorus discharged above the applicable WQBEL (.0075 mg/L) and subject to penalty payment for 2025 was 17 pounds. This was down dramatically from prior years due to implementation of the Ferric Chloride system.

Total phosphorus from DNR reporting

2024							
Month	Average Phos (mg/L)	Total Monthly Flow (Millions of Gallons)	Total Monthly Load (lbs/mo) 1	Applicable WQBEL (mg/L) 2	Allowable Monthly Load (lbs/mo) (1.0 MVD eff 4.1.25)	Monthly Exceedance WQT Credits Needed (lbs/mo) 3	
JAN	4.036	0.152	5.13	0.075	0.10	5.03	
FEB	3.642	0.128	3.88	0.075	0.08	3.80	
MAR	3.956	0.107	3.54	0.075	0.07	3.48	
APR	3.937	0.164	5.37	0.075	0.10	5.27	
MAY	3.506	0.426	12.46	0.075	0.27	12.19	
JUN	3.695	0.598	18.42	0.075	0.37	18.05	
JUL	4.079	0.632	21.50	0.075	0.40	21.10	
AUG	4.909	0.548	22.44	0.075	0.34	22.09	
SEP	0.333	0.548	1.52	0.075	0.34	1.18	
OCT	0.192	0.532	0.85	0.075	0.33	0.52	
NOV	0.161	0.546	0.73	0.075	0.34	0.39	
DEC	0.161	0.480	0.64	0.075	0.30	0.34	
Total Credits Needed (sum of all monthly values)						93.45	
1 Total Monthly Load (lbs/mo) = Average Phosphorus Concentration * Total Monthly Flow * 8.34							
2 Allowable Monthly Load. (lbs/mo) = Total Monthly Flow * Applicable WQBEL * 8.34							
3 Monthly Exceedance: WQT Credits Needed (lbs/mo) = Total Monthly Load - Allowable Monthly Load							

2025							
Month	Average Phos (mg/L)	Total Monthly Flow (Millions of Gallons)	Total Monthly Load (lbs/mo) 1	Applicable WQBEL (mg/L)	Allowable Monthly Load (lbs/mo) 2	Monthly Exceedance WQT Credits Needed (lbs/mo) 3	
JAN	0.183	0.367	0.56	0.075	0.23	0.33	
FEB	0.233	0.161	0.31	0.075	0.10	0.21	
MAR	0.264	0.177	0.39	0.075	0.11	0.28	
APR	0.451	0.272	1.02	0.075	0.17	0.85	
MAY	0.256	0.539	1.15	0.075	0.34	0.81	
JUN	0.206	0.735	1.26	0.075	0.46	0.80	
JUL	0.310	0.813	2.10	0.075	0.51	1.59	
AUG	0.299	0.798	1.99	0.075	0.50	1.49	
SEP	0.298	0.684	1.70	0.075	0.43	1.27	
OCT	0.541	0.592	2.67	0.075	0.37	2.30	
NOV	0.426	0.486	1.73	0.075	0.30	1.42	
DEC	0.509	0.444	1.88	0.075	0.28	1.61	
Total Credits Needed (sum of all monthly values)						12.98	

1 Total Monthly Load (lbs/mo) = Average Phosphorus Concentration * Total Monthly Flow * 8.34

2 Allowable Monthly Load, (lbs/mo) = Total Monthly Flow * Applicable WQBEL * 8.34

3 Monthly Exceedance: WQT Credits Needed (lbs/mo) = Total Monthly Load - Allowable Monthly Load

2026							
Month	Average Phos (mg/L)	Total Monthly Flow (Millions of Gallons)	Total Monthly Load (lbs/mo) 1	Applicable WQBEL (mg/L)	Allowable Monthly Load (lbs/mo) 2	Monthly Exceedance WQT Credits Needed (lbs/mo) 3	
JAN	0.315	0.313	0.82	0.2	0.52	0.30	
FEB	0.241	0.213	0.43	0.2	0.35	0.07	
MAR	0.539	0.334	1.50	0.2	0.56	0.94	
APR	0.434	0.686	2.49	0.2	1.14	1.34	
Total Credits Needed (sum of all monthly values)						2.66	

1 Total Monthly Load (lbs/mo) = Average Phosphorus Concentration * Total Monthly Flow * 8.34

2 Allowable Monthly Load, (lbs/mo) = Total Monthly Flow * Applicable WQBEL * 8.34

3 Monthly Exceedance: WQT Credits Needed (lbs/mo) = Total Monthly Load - Allowable Monthly Load

**The last column is pounds per month that informs the trade ratio (at proposed 1.2:1)

The downside of the chemical feed system is the increase in operational complexity (balancing feed rates and monitoring), increased solids and hauling costs, chemical costs, and system maintenance costs. These are significant for a small district.

d. Phosphorus reduction future considerations

We don't foresee major changes in influent volume or composition. Some continued residential development will continue, but residential additions add minimal total volume as water conservation practices have continued to mitigate volume growth. The chemical feed system will continue to be refined in its application and water quality trading will offset the remaining TP quantity in the effluent.

e. Credits Needed

Based on historical usage and phosphorus reductions experienced with chemical treatment in the past year (since August 2024) assuming little/no increase in volume and no change in the type of influent the plant would produce roughly 15-25 pounds of phosphorus annually. Due to the heavy seasonality of our flow and tourism driving the commercial facilities within the sanitary district, the actual phosphorus discharge will vary from the projection.

We foresee additional acreage at the Michaels farm and the addition of acreage from Wintergreen owned by the Driftless Area Land Conservancy. The Lowery Creek Watershed Initiative will continue to encourage preservation of this treasured watershed.

With a 1.2:1 trade ratio, an offset of 18 to 30 pounds of phosphorus reduction would be required to yield 5 to 30 credits.

3. Baseline and Proposed Conditions of Credit Generating Sites

a. Credit Generator Locations

See the attached map. All project sites are in the same HUC-12 and directly adjacent to the Lowery Creek and upstream from the treatment plant's standards application. See Appendix 7

b. Credit Generation Location #1 Pacha (Appendix 11)

i. Baseline Load: See Pacha Snap Plus P-Trade Report

The field was in continuous corn/soybean rotation at the time of enrollment. Soils were sampled in December 2022 prior to implementation to establish baseline nutrient levels. Soil samples were conducted at 6-inch depth by UW WI Soil Analysis Lab.

ii. Proposed Conditions – See field map in Appendix 11

Native grasses were planted in early 2023 (confirmed in email from owner in March 2023) in two fields with a total of 7.6 acres. This serves as a conservation cover. These grasslands are permanent and will not be harvested.

iii. Management Practice Details

NRCS 327 Conservation will be followed. General conditions and maintenance as follows:

Vegetation Cover

- Always maintain a minimum of 70% live vegetative canopy cover during the growing season.
- Maintain a minimum stubble height of 4 inches after any cutting or mowing.
- Fields must remain in perennial cover for the full duration of the agreement.

Maintenance Requirements

Perform the following maintenance tasks as needed throughout the agreement period:

- Reseeding and Stand Repair: Inspect stands each spring and after disturbance events (flooding, drought, heavy traffic).
- Reseed any bare or thin areas (below 70% canopy cover) within the same growing season or the following spring.
- Use the same seed mix specified in the original seeding plan, or an NRCS-approved equivalent.
- Protect reseeded areas from traffic and disturbance until plants are established.

Erosion and Concentrated Flow

- Inspect fields after significant rainfall events for signs of concentrated flow, rilling, or gullyng.
- If concentrated flow paths develop: regrade affected areas, reseed immediately, and contact your local NRCS office.
- Do not allow erosion features to persist. Address them within 30 days of discovery.

Structures and Fencing (if applicable)

- Maintain any fencing, water control structures, or diversions in good working order.
- Repair damaged fencing within 14 days to prevent livestock intrusion.
- Inspect structures after storm events and repair damage promptly.

c. Credit Generation Location #2 Savanna Institute (appendix 12)

The five enrolled fields originated as varying soybean, small grain or alfalfa/grass per the narrative and crops report in the appendix. They are being transitioned to perennial pasture under this Water Quality Trading agreement. No row crops shall be planted on enrolled fields during the agreement period. The proposed conditions described herein represent the management end-state and are binding for the duration of the agreement.

i. Baseline Conditions & Load

1. See narrative above and in the appendix.
2. Collection and results of samples
3. Soil samples were done in December 2021 when these fields were managed by Otter Creek. (See attachment of soil sampling map and lab results)
4. Practice establishment was done in accordance with NRCS 512 (Forage and Biomass Planting) and NRCS 528 (Prescribed Grazing)

ii. Proposed Conditions / Management

The enrolled fields shall be seeded with a perennial grass or grass/legume mixture in accordance with NRCS CPS 512 (Forage and Biomass Planting). The following conditions apply for the duration of the WQT agreement:

- No row crops shall be planted on enrolled fields during the agreement period.
- No commercial nutrient application (fertilizer, manure, or biosolids) shall occur on enrolled fields. The Snap Plus model has been configured to reflect zero nutrient application; this condition is binding and shall be clearly maintained in all management records.
- Enrolled fields shall be managed as perennial hay pasture with rotational stocking or as an alfalfa/grass mixture, consistent with the proposed end state.
- A minimum of 70% live canopy cover shall be maintained across enrolled fields during the growing season.

- Minimum stubble height after any cutting or grazing event shall not be less than 4 inches.
- Fields will not be harvested, only grazed.

iii. See the Snap Plus P-Trade Report Appendix 12

iv. Operations and Management Practice Details

The following Operations and Maintenance (O&M) Plan applies to all conservation practices implemented at Credit Generation Site #2 – Savanna Institute. This plan is organized by practice and shall be followed for the duration of the WQT agreement.

Forage and Biomass Planting (NRCS CPS 512)

Practice establishment occurred in accordance with NRCS Technical Standard 512. The following requirements apply during establishment and ongoing stand management:

Seeding & Establishment:

1. Identified crop fields shall be seeded with a perennial grass or grass/legume mixture. No row crops will be planted on these fields, nor will nutrient application occur on these fields during the agreement period.
2. Inspect and calibrate seeding equipment prior to use. Continually monitor seeding equipment performance during planting to achieve proper rate, distribution, and depth of planting material.
3. Monitor the growth of desired seedlings during the establishment period. Document establishment progress and compare against planned species composition.
4. Monitor new plantings for water stress. Depending on drought severity, mitigate water stress by reducing competing weeds, irrigating when possible, or replanting failed stands.
5. New seedlings shall not be harvested until plants have established sufficient root systems to withstand traffic and recover from removal of top growth.
6. Apply mowing or herbicide treatments as necessary to control competitive weeds during establishment. Mowing shall occur before weeds develop mature seed. Residue from mowing shall be uniformly distributed or harvested to avoid smothering new seedlings.
7. Reseed as needed to maintain sufficient growth and vegetative coverage. A minimum of 70% live canopy cover shall be maintained during the growing season.

Ongoing Stand Management:

- Reseed bare areas as necessary to maintain adequate stand density and prevent erosion.
- Inspect fields for concentrated flow paths after significant rainfall events. Should concentrated flow paths develop, corrective action will taken (regrading and seeding) promptly to prevent the formation of rills or gullies.
- Field perimeters and waterways will be maintained in vegetated condition at all times.

Prescribed Grazing (NRCS CPS 528)

Operations:

- Prescribed grazing shall be applied on a continuing basis throughout the livestock occupation period of all planned grazing units.
- Adaptive management decisions shall be made as needed and documented within the grazing plan to ensure that goals and objectives of the prescribed grazing strategy are met.

Maintenance:

- Monitoring data and grazing records shall be used on a regular basis to ensure objectives are being met, or to make necessary changes to the prescribed grazing plan.
- All facilitating conservation practices (e.g., Fence (Code 382), Pest Management (Code 595), Brush Management (Code 314), Forage and Biomass Planting (Code 512)) that are needed to effect adequate grazing distribution shall be maintained in good working order and operated as intended.

v. NRCS Grazing Plan

Goals:

- To raise cattle using a system of rotational grazing.
- Improve the overall health of the herd.
- To increase carrying capacity of the pasture by improving forage quantity and quality.
- Generate additional income by improving animal performance.

Inventory

General Description: A herd of approximately 50 head of beef steers will be planned to utilize the pasture system. (50 animal units.).

Currently the landowner is following a rotational grazing plan on the tract. Within his plan he grazes 47 acres, and of these 47 acres 38.79 acres will be entered into a CRP Grasslands contract. The area consists primarily of Kentucky Bluegrass, Red Clover, and Orchardgrass with a minor component of Meadow Fescue and Smooth Brome.

See attached map for location of planned grazing areas.

Soils: Soils are assigned to Forage Suitability Groups (FSG) according to their suitability for hayland and pasture management. Forage species will have different responses to various soil characteristics, and the FSG provide a general means of selecting the pasture or hayland plants best suited to a particular site and a relative means of estimating potential productivity.

The predominant soils for this grazing system consist of Orion, Ettrick, and Churchtown. Orion soils (FSG 10) consist of occasionally flooded soils with approximate slopes of 0-3%. Ettrick soils (FSG 5) have a slope of 0-2% and are frequently flooded. Churchtown soils (FSG 7) are adequately drained with a slope of 12-20. All of these soils are silt loam.

It is suggested that pastures be fertilized based on current soil tests and nutrient management plan recommendations to bring soils up to optimum nutrient levels. Before doing any seeding, take soil samples and correct any nutrient deficiencies shown by the soil test results.

Forage Management and Rotation of Livestock

Rotation of livestock is based on forage height, not calendar days, especially in cases where paddocks are different sizes and vary in pasture productivity. If using a paddock system, consider rotating through paddocks faster in the spring, when rest periods between grazing could be as little as 10-15 days, and slower in the mid-summer, when rest periods could be as great as 30-45 days.

Do not overgraze! If the next pasture in the rotation to be grazed is not at optimum grazing heights, livestock need to be placed in a different pasture with optimum forage heights or moved to a barn or "sacrifice area" and fed stored feeds. Refer to the table below for appropriate heights to begin and end grazing.

Species	Optimum Forage Height (inches) "START GRAZING"	Minimum Forage Height (inches) "END GRAZING"
Alfalfa	8-12	4
Red Clover	8-12	4
Alsike Clover	8-12	4
Ladino Clover	8-12	4
Kura Clover	8-12	4
Festulolium	6-8	3
Kentucky Bluegrass	4-6	2
Meadow Fescue	8-12	4
Orchardgrass	8-12	4
Perennial Ryegrass	6-8	3
Reed Canarygrass	8-12	4
Smooth Bromegrass	8-12	4
Tall Fescue	8-12	4
Timothy	8-12	4
Big Bluestem	12-14	6
Indiangrass	12-14	6
Little Bluestem	4-6	2
Sideoats Grama	4-6	2
Switchgrass	12-14	6

Adapted from WI NRCS Standard 528 "Prescribed Grazing" (April 27, 2017)

Forage Production: Per the SnapPlus summary the fields/acres available for grazing are identified. It is estimated that these pastures could produce 138 to 141 tons of dry matter/acre/year of forage.

Stocking Rate: Current plans are to place approximately 50 animal units in total on the pasture in early spring where they will remain until early fall. Steers will average 750 lbs. while on pasture. Total forage demand is estimated at 2000 lbs. /day.

Forage-Animal Balance: Based on projected forage production and stocking rate, there will be enough forage for approximately 3 days of grazing per 4.5 acre paddock. The landowner will follow his current grazing system-rotating livestock every two- three days throughout the existing fifteen paddocks. Paddock size ranges from 1.6 acres to 4.8 acres. Keep in mind that rotation of livestock is based on pasture height and not time spent in the pasture. If the height of the vegetation reaches minimum

heights before this time, animals should be removed from the area to allow the pasture to regrow.

There are many factors that influence the number of days available for grazing including changes to animal numbers, types of livestock grazing in your system, changes to forage composition, weather conditions, etc. If you choose to change the number or types of animals in your grazing system, it is not required to have NRCS modify your plan as long as the appropriate forage heights are maintained (see Table 1).

Contingency Plan: In the event of extreme weather conditions, such as drought or wet conditions, actions should be taken to adjust the grazing management to avoid damage to the pasture. You should designate an area where cattle can be kept during times when pasture is short or when pastures are too wet to be grazed without doing damage. Getting livestock off of pasture during these times will help to ensure a healthy re-growth of pasture forages when optimal grazing and growing conditions return. Typical locations for a sacrifice area can include: Well fenced barnyard, Winter housing areas, Harvested crop fields. For this grazing system, the animals will be removed from the pasture and placed in housing or an open lot at the farmstead.

Over-Wintering: Pastures may be used for housing and feeding livestock during the winter months; however, livestock must be removed in the spring until new growth reaches acceptable grazing heights shown in Table 1. Any areas where vegetation is damaged or destroyed must be reseeded.

Monitoring Pastures: The best method for monitoring pasture productivity is to measure the amount of forage available. You are encouraged to measure and record pre- and post-grazing heights to determine the amount of forage actually consumed and/or available to grazing animals during different times of the year. Measuring and monitoring pasture growth and livestock consumption of pasture will be especially helpful during the first couple of years of managed grazing as it will allow you to gain an eye for estimating the available forage in a paddock. A daily log of the number of animals on pasture and the dates when paddocks are utilized is also very helpful during the grazing season.

Facilitating Practices

Fences: Currently, there is existing fence around the pasture and existing paddock fencing that is adequate for the operation.

Watering System: Most research suggests that animals will utilize pasture more efficiently and will tend to drink individually rather than in a group when the distance to water is less than 900 feet. Water provided to the livestock should be clean and fresh for maximum animal performance. Ongoing monitoring of watering areas will be needed to watch for signs of excessive soil compaction and/or erosion. Water is provided in all paddocks.

Cattle Lanes:

There is an existing cattle lane on the property that is in good condition.

Plan Review and Acceptance

Minimum vegetation heights shown in the table above will remain at all times during the grazing season. Livestock will not be placed on pasture until optimum vegetation heights are reached.

Through the dates of May 15- Aug 1 less than 50% of pastures can be harvested for hay.

Make available a planned sacrifice area, such as a barn/feedlot area, for drought and excess water conditions or when forage is likely to be damaged or destroyed. Keep the livestock off of the pasture until optimum vegetation heights are achieved.

If livestock are kept on the pasture during winter months, they will be removed in the spring until new growth reaches acceptable grazing heights. Any areas where vegetation is damaged or destroyed will be reseeded.

Monitoring data and grazing records will be used on a regular basis to ensure objectives are being met or to make necessary changes in the prescribed grazing plan. Types of records include: location of animals and pasture usage during the grazing season including residency periods, rest periods, hay removal, etc.

The grazing system shall keep livestock stress to a minimum by always providing adequate supplies of water and forage.

d. Credit Generation Location #3 Michaels (Appendix 13)

i. Baseline Load, Snap Plus P-Trade Report

Field in corn-cover crop rotation. Converted to blueberries in 2023.

ii. Proposed Conditions – see field map

Conservation cover which is done by establishing and maintaining permanent vegetative cover in alignment with NRCS 327. The field was previously used for conventional agriculture consisting of Corn-wheat rotation. In 2023 this was seeded down to permanent cover grass cover with rows of blueberry plants, with mulch around the plants and grass cover maintained between the rows.

The orchard operation consists of harvesting blueberries in season. Plants were planted at a density of 1200 per acre. Periodic removal/replacement of plants might occur as needed without compromising the conservation purpose.

iii. Management Practice Details

1. Practices & Standards – NRCS or similar

Conservation Practice Standard Conservation Cover (Code 327)

2. Operations and Maintenance Plans:

OPERATION AND MAINTENANCE:

- Mowing or herbicide applications shall be used as necessary to control competitive weeds. Mowing should be done when introduced grasses reach 6-8 inches tall and before the weeds develop matured seed. The residue from mowing shall be uniformly distributed or removed as necessary to avoid smothering the new seedlings. Native warm season grasses should be mowed no lower than 7 inches.
- If wildlife habitat enhancement is a purpose, practice maintenance activities shall not disturb cover during the nesting period (May 15 to August 1) for desired wildlife species. Exceptions shall be made to spot treat necessary weed invasions prior to them setting seed.
- Maintenance measures must be adequate to control the establishment and

spread of noxious weeds and other invasive species.

- To benefit insect food sources for grassland nesting birds, spray or other means to control noxious weeds shall be done on a “spot basis” to protect forbs and legumes that benefit native pollinators and other wildlife.
- Bare areas will be reseeded and actions to remedy concentrated flow paths (such as regrading) to prevent the development of rills or gullies.

4. Trade Ratio

i. Trade Ratio Factors

1. Delivery factor and Downstream Factor

A delivery factor is not required as the credits generators and credit user are both located in the same 12-digit hydrological unit, and all credit generators are upstream from the credit user.

2. Equivalency – this trading is for phosphorus, so an equivalency factor is not necessary.

3. Uncertainty – a nonpoint source credit generator and management practices are affecting the main mechanisms of pollutant delivery including whole field management, companion crops. The uncertainty factor is 1.

4. The stated trade ratio is 1.2:1. (source water quality trading guidance 2020, p.29)

ii. Trade Ratio Calculation

1. Trade Ratio = (Delivery + Downstream + Equivalency + Uncertainty):1

2. Trade Ratio = (N/A + N/A + N/A + 1):1

3. Our calculated trade ratio = 1:1.

4. The minimum trade ratio of 1.2:1 will apply.

5. Credit Generation

A summary of credit generation is provided in the table form in the appendix referenced below. The BMPs have been implemented as this plan was being created and approved. With the leadership of the Lowery Creek Watershed Initiative (sponsored by Driftless Area Land Conservancy) these landowners and the lessee have taken a long-term land stewardship view. They have jointly worked on these efforts and carefully monitored stream/stream fishery quality and believe strongly in conservation practices.

See [Appendix 10](#)

Iowa County Land Conservation has led the SnapPlus reporting process and the reports are included in the appendices.

6. Tracking, Inspecting, Reporting

i. Credit Usage Tracking

The District will track credits used monthly. The District will report credit usage to the DNR monthly in the Discharge Monitoring Report (DMR). The annual report will summarize the 12 months of credit usage and credit generation. The District will report to the DNR any concern that they have that may result in a need to modify the trade agreement and/or this trade plan. This may include a change in practice or change in TP discharged.

ii. Inspections

Inspection of BMPs has been conducted at the initiation of the trade agreement utilization and semi-annually thereafter. Once at the beginning of the growing season and once at the end of the growing

season. A qualified individual will conduct the inspection with the template included in [Appendix 5](#).

If a major storm event occurs, rain over six inches in 24-hour period, an additional inspection will occur.

iii. Reporting

An annual report of water quality trading will be submitted to the Wisconsin DNR, and the stakeholders in this plan including the Lowery Creek Watershed Initiative, Driftless Area Land Conservancy, landowners and lessee, in addition to the District Commission and Town of Wyoming board.

Appendices:

- 1) Notice of Intent to Conduct Water Quality Trading (Form 3400-206)
- 2) WQT Credit Generator Agreement – WQT Agreement with Landowners.pdf
- 3) Practice Registration Forms (Form 3400-207) one for each of 4 sites.
- 4) WQT Checklist (Form 3400-208)

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Page 1 of 2

Notice: Pursuant to s. 283.54, 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 Spring Green Golf Course SD #2		Permit Number WI-0028383-10-1		Facility Site Number 125002790
Facility Address 5320 Hwy C		City Spring Green	State WI	ZIP Code 53588
Project Contact Name (if applicable) Mark Baker		Address 1621 S Springs Dr	City Spring Green	State WI
			ZIP Code 53588	
Project Name SGGCSD#2 and Lowery Creek Watershed Initiative WQT Plan				
Receiving Water Name Unnamed Trib of Lowery Creek		Parameter(s) being traded Phosphorus		HUC 12(s) 070700051203

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

☐ Point source dominated

☒ Nonpoint source dominated

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

Are any of the credit generators in a different HUC 12 than the applicant? ☐ Yes; HUC 12: _____
☒ No

☐ Unsure

Are any of the credit generators downstream of the applicant? ☐ Yes
☒ No
☐ Unsure

Will a broker/exchange be used to facilitate trade? ☐ Yes; Name: _____
☒ No
☐ Unsure

Point to Point Trades (Traditional Municipal / Industrial Discharge, MS4, CAFO)				
Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Page 2 of 2

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

List the practices that will be used to generate credits:

Conversion to Perennial Prairie, Conversion to pasture, Inclusion of cover crop and no-till practices, Conversion to orchard, etc. These will follow applicable NRCS standards as outlined in the water quality trading plan.

Method for quantifying credits generated:

☐ Monitoring

☒ Modeling, Names: SNAP Plus

☐ Other: _____

Projected date credits will be available:

The preparer certifies all of the following:

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

Signature of Preparer

Mal A. Belton

Date Signed

9-30-25

Authorized Representative Signature

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

Signature of Authorized Representative

Mal A. Belton

Date Signed

9-30-25

Via E-Mail

Dear (landowner/lessee)

The Lowery Creek Watershed Initiative you have been involved with is reaching its next important milestone. The conservation practices you have been working on with Dick Cates, the Initiative, and the Iowa County Land and Water Conservation staff is to be formalized and included in a Water Quality Trading Plan by the Sanitary District as part of their permit renewal.

The Spring Green Golf Course Sanitary District #2 was established in the 1980's to support the development in the Township including Wintergreen, Taliesin, Taliesin Visitors Center, House on the Rock Resort & Golf Course, American Players Theatre and the residences adjacent to the golf course. Up until late 2023 the district was directly managed by the township. In October 2023, the Township appointed a separate commission composed of individuals representing those who are directly part of the Sanitary District.

The conservation practices you have implemented and resulting phosphorus (and related nutrients & organic matter) reductions are not only beneficial to our precious Lowery Creek, but they also qualify for water quality trading credits. The sanitary district can use these credits to offset the limited phosphorus that is produced beyond their recent phosphorus reductions and the DNR determined permit levels.

The agreement you will find attached is required by the DNR to formalize the practices you have already put in place. Additionally, we are required to conduct an annual visual inspection to ensure the practices are maintained.

Please sign and return the attached at your convenience, but prior to September 23rd, 2025. Please address questions you might have to both of us.

Signed,

Dick Cates
Chair
Town of Wyoming
richardlcates@gmail.com
608-712-2836

Mark Baker
President
Spring Green Golf Course Sanitary District #2
mark@baker15.com
608-516-0685

Water Quality Trading Credit Generator Landowner Agreement

This Agreement is made and entered into as of September 30, 2025, by and between:

- Landowner/Lessor/Credit Generator: Danielle Pacha, danielle.pacha@gmail.com

Property Address: 6310 Hillside School Road, Spring Green, WI 53588

Tax Address: 5801 Taft Street, Middleton, WI 53562

- Sanitary District Permittee (Permittee):

Name: Spring Green Golf Course Sanitary District #2

WPDES Permit #: 0028363-10-0

Contact: Mark Baker, District Commission President, mark@baker15.com 608-516-0685

- Land Lessee/Party responsible for conservation practices
Same as above.

1. Purpose

This Agreement sets forth terms under which the Landowner agrees to implement and maintain specific conservation practices (BMPs) that generate water quality trading credits. These credits will be provided to Spring Green Golf Course Sanitary District #2 (Permittee) for use toward compliance with phosphorus under their WPDES permit, as permitted by Wis. Stat. § 283.84.

2. Description of Property & Practices

Location: 6310 Hillside School Road, East Prairie & Upper Section South

Practice(s) Installed:

Native grasses were planted in 2022 in two fields with a total of 7.6 acres. This serves as a conservation cover. These grasslands are permanent and will not be harvested.

Modeling Tool Used: SnapPlus (by Iowa County Land & Water Conservation)

Estimated Credit Generation: [e.g., 105 lbs phosphorus/year]

Installation Date: 2022

BMP Lifespan: 5 years (until April 1, 2030)

Maintain and operate as outlined in [NRCS Code 327](#):

- Protect the cover from irreversible damage by traffic, implements, and herbicides.
- Periodic removal of some products (such as high value trees, medicinal herbs, nuts, and fruits) is permitted provided the conservation purpose is not compromised by the loss of vegetation or harvesting disturbance.

- Mowing and harvest operations in a perennial crop system (such as orchards, vineyards, berries, and nursery stock), will be accomplished in a manner that minimizes the generation of particulate matter.
- Mowing may be needed during the establishment period to reduce competition from weeds.
- Control noxious weeds and invasive species.
- If wildlife habitat enhancement is a purpose, maintenance practices and activities will occur during periods of the day or season to minimize negative impacts of disturbance.
- If wildlife habitat is a purpose, include the procedures necessary to conserve the cover's wildlife habitat functions.
- To support insects eaten by grassland nesting birds, spot treat noxious weeds to protect other forbs and legumes that benefit native pollinators and other wildlife.
- Revegetate bare spots when they occur.

3. Term and Renewal

This Agreement will remain in effect for a term of approximately 5 years, beginning on the date of execution and extending to April 1, 2030. It may be extended by mutual written agreement or automatically renewed if the WPDES permit is reissued and requires continued credits.

Changes can be made to the practices by mutual agreement of both parties and will be noticed to Wisconsin DNR as per Water Quality Trading Plan.

4. Landowner Responsibilities

The Landowner agrees to:

- Install and maintain the practices listed in Item 2 above in accordance with NRCS standards.
- Allow inspection and verification by the District and WDNR with reasonable notice.
- Cooperate with required recordkeeping, including photographs, receipts, or field logs.
- Notify District within 30 days of sale or transfer of land or change in lessee, if any.

5. District (Permittee) Responsibilities

The District (Permittee) agrees to:

- Submit the trading plan and agreements to WDNR for approval and incorporation into the WPDES permit.
- Coordinate with the Landowner for ongoing verification and credit use.

6. Verification and Maintenance

Verification Frequency: Twice Annually or after significant rain event.

The District and/or qualified individual will perform the verification/inspection.

Corrective Action Timeline: Landowner shall correct deficiencies within 60 days after written notice, adjusted based upon normal seasonal/conservation practice patterns.

7. Transferability

If the property is sold or transferred, the Agreement:

- Shall transfer to the new owner unless the District agree in writing to terminate this agreement.
- Landowner agrees to disclose this Agreement to prospective buyers.

8. Termination

This Agreement may be terminated:

- By mutual written agreement of all parties.
- By the District (Permittee) if the Landowner fails to maintain BMPs after written notice and 60 days to cure.
- If WDNR terminates approval of the associated credits.

9. Miscellaneous

- Governing Law: This Agreement shall be governed by the laws of the State of Wisconsin.
- Entire Agreement: This constitutes the full agreement between the parties.
- Amendments: Any changes must be made in writing and signed by all parties.
- Liability: Landowner assumes responsibility for on-site safety and compliance with practice installation.

10. Signatures

Landowner:

Signature: _____

Print Name: _____

Date: _____

Land Lessee:

Signature: _____

Print Name: _____

Date: _____

Permittee:

Signature: _____

Print Name: _____

Title: _____

Date: _____

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 Spring Green GC Sanitary District #2		Permit Number WI- 0028383-10-1		Facility Site Number 125002790	
Facility Address 5230 Hwy C			City Spring Green	State WI	ZIP Code 53588
Project Contact Name (if applicable) Mark Baker		Address 1621 S Springs Dr		City Spring Green	State WI
				ZIP Code 53588	
Project Name Pacha					
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	SGGC_SD-LC 1	Native grasses were planted in 2022 in two fields with a total of 7.6 acres. This serves as a conservation cover. These grasslands are permanent	7	2:1	SnapPlus
County Iowa		Closest Receiving Water Name Lowery Creek	Land Parcel ID(s) '028-0487, 028-0484, 028-	Parameter(s) being traded 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 9-30-25		
Authorized Representative Signature					
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.					
Signature of Authorized Representative 			Date Signed June 30, 2026		
Leave Blank – For Department Use Only					
Date Received			Trade Docket Number		
Entered in Tracking System ☐ Yes		Date Entered	Name of Department Reviewer		

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 Spring Green GC Sanitary District #2		Permit Number WI- 0028383-10-1		Facility Site Number 125002790	
Facility Address 5230 Hwy C			City Spring Green	State WI	ZIP Code 53588
Project Contact Name (if applicable) Mark Baker		Address 1621 S Springs Dr		City Spring Green	State WI
				ZIP Code 53588	
Project Name Savanna					
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	SGGC_SD-LC 2	Conversion to hay pasture with rotational stocking or alfalfa/grass. NRCS 528 or similar.	13	2:1	SnapPlus
County Iowa		Closest Receiving Water Name Lowery Creek	Land Parcel ID(s) '028-111, 112, 116, 118	Parameter(s) being traded 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 9-30-25		
Authorized Representative Signature					
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.					
Signature of Authorized Representative 			Date Signed June 30, 2026		
Leave Blank – For Department Use Only					
Date Received			Trade Docket Number		
Entered in Tracking System ☐ Yes		Date Entered	Name of Department Reviewer		

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 Spring Green GC Sanitary District #2		Permit Number WI- 0028383-10-1		Facility Site Number 125002790	
Facility Address 5230 Hwy C			City Spring Green	State WI	ZIP Code 53588
Project Contact Name (if applicable) Mark Baker		Address 1621 S Springs Dr		City Spring Green	State WI
				ZIP Code 53588	
Project Name Michaels					
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	SGGC_SD-LC 3	Conservation cover with permanent blueberry plans/orchard with mulch and grass cover.	6	2:1	SnapPlus
County Iowa		Closest Receiving Water Name Lowery Creek	Land Parcel ID(s) '028-0111, 028-0116	Parameter(s) being traded 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 9-30-25		
Authorized Representative Signature					
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.					
Signature of Authorized Representative 			Date Signed June 30, 2026		
Leave Blank – For Department Use Only					
Date Received			Trade Docket Number		
Entered in Tracking System ☐ Yes		Date Entered	Name of Department Reviewer		

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 Spring Green Golf Course SD #2		Permit Number WI- 0028383-10-1		Facility Site Number 125002790	
Facility Address 5320 Hwy C			City Spring Green	State WI	ZIP Code 53588
Project Contact Name (if applicable) Mark Baker		Address 1621 S Springs Dr		City Spring Green	State WI
				ZIP Code 53588	
Project Name SGGCSD#2 and Lowery Creek Watershed Initiative WQT Plan					
Receiving Water Name Unnamed Trib of Lowery Creek		Parameter(s) being traded Phosphorus		HUC 12(s) 070700051203	
Credit Generator Information					
Credit generator type (select all that apply):					
☐ Permitted Discharge (non-MS4CAFO)		☐ Urban nonpoint source discharge			
☐ Permitted MS4		☒ Agricultural nonpoint source discharge			
☐ Permitted CAFO		☐ Other - Specify: _____			
Are any of the credit generators in a different HUC 12 than the applicant? ☐ Yes; HUC 12: _____					
☒ No					
Are any of the credit generators downstream of the applicant? ☐ Yes					
☒ No					
Will a broker/exchange be used to facilitate trade? ☐ Yes (include description and contact information in WQT plan)					
☒ No					
Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)					
Are each of the point source credit generators identified in this section in compliance with their WPDES permit requirements? ☐ Yes					
☐ No					
Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number	
☐ Traditional ☐ MS4 ☐ CAFO					
☐ Traditional ☐ MS4 ☐ CAFO					
☐ Traditional ☐ MS4 ☐ CAFO					
☐ Traditional ☐ MS4 ☐ CAFO					
☐ Traditional ☐ MS4 ☐ CAFO					

Water Quality Trading Checklist

Form 3400-208 (1/14)

Page 2 of 3

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

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

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

Discharge Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
☐ Urban NPS ☒ Agricultural NPS ☐ Other	Companion Crop: Conversion to native prairie	SnapPlus v20.4	SGGC_SD-LC 1 (Pacha)	☒ Yes ☐ No ☐ Only in part
☐ Urban NPS ☒ Agricultural NPS ☐ Other	Whole field - conversion to pasture, no till	SnapPlus v20.4	SGGC_SD-LC 2 (Savanna Inst)	☒ Yes ☐ No ☐ Only in part
☐ Urban NPS ☒ Agricultural NPS ☐ Other	Companion Crop - conversion to orchard	SnapPlus v20.4	SGGC_SD-LC 3 (Michaels)	☒ Yes ☐ No ☐ Only in part
☐ Urban NPS ☒ Agricultural NPS ☐ Other	Whole field - conversion to cover crop	SnapPlus v20.4	SGGC_SD-LC 4 (Eynon-Lynch)	☒ 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	see TOC
b. Management practices used to generate credits ☒ Yes ☐ No	see TOC
c. Amount of credit being generated ☒ Yes ☐ No	see TOC
d. Description of applicable trade ratio per agreement/management practice ☒ Yes ☐ No	see TOC
e. Location where credits will be generated ☒ Yes ☐ No	see TOC
f. Timeline for credits and agreements ☒ Yes ☐ No	see TOC
g. Method for quantifying credits ☒ Yes ☐ No	see TOC PDF p.31

Water Quality Trading Checklist

Form 3400-208 (1/14)

Page 3 of 3

Does plan have a narrative that describes:		Plan Section
h. Tracking procedures	☒ Yes ☐ No	see TOC
i. Conditions under which the management practices may be inspected	☒ Yes ☐ No	see TOC
j. Reporting requirements should the management practice fail	☒ Yes ☐ No	see TOC
k. Operation and maintenance plan for each management practice	☒ Yes ☐ No	see TOC
l. Location of credit generator in proximity to receiving water and credit user	☒ Yes ☐ No	see TOC
m. Practice registration documents, if available	☒ Yes ☐ No	see TOC
n. History of project site(s)	☒ Yes ☐ No	see TOC
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 9-30-25
--	------------------------

Authorized Representative Signature

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

Signature of Authorized Representative 	Date Signed 9-30-25
---	------------------------

5) Site Inspection Template

WQT SITE INSPECTION CHECKLIST

Inspections must be conducted in clear conditions (no precipitation, fog, high water, or obstructed views). Inspector must be close enough to each practice to make valid observations.

Property / Project Name:	
Inspector:	
Date:	
Weather Conditions:	
Practices Inspected:	
Were photos taken?	Yes / No (Photos must be captioned with field name per WQT Plan naming convention)

Rating Key: 1 = Good 2 = Monitor 3 = Needs Repair					
#	Item	N/A	1	2	3
VEGETATION COMPOSITION					
1	Vegetation matches plan (correct species; appropriate legume, grass, forb, tree, and/or shrub mix)				
2	Adequate vegetation cover (few to no bare patches; survival rate or seed establishment is satisfactory; newly established vegetation is expected height/density)				
Notes: _____ _____					
VEGETATION CONDITION					
3	Vegetation appears free from stress (disease, insect damage, drought, flooding, etc.)				
4	Nuisance weeds, shrubs, and/or trees are absent or minimal				
5	No visible signs of erosion (rills, gullies, or concentrated flow paths)				
6	Vegetation height is adequate (not mowed or grazed below 4 inches, or other height per plan)				
7	Management/disturbance practices are done according to plan (timing, methods, area affected)				

8	Bare areas have been reseeded as necessary; minimum 70% live canopy cover maintained during growing season				
Notes:					
STRUCTURAL PRACTICES					
9	Structures are in good condition (fencing, water systems, riprap, etc.)				
10	Structures are functioning as intended				
11	No signs of erosion at or near structures				
Notes:					
WATER QUALITY					
12	No signs of concentrated flow, runoff, or active rill/gully development				
13	Streambank condition is not visibly worsening (no increased erosion or sloughing)				
14	Water quality not visibly degraded (no excess algae, fish kills, etc.)				
Notes:					
O&M COMPLIANCE					
15	No row crops planted on enrolled fields; no nutrient applications observed				
16	Grazing pressure appears consistent with prescribed grazing plan (where applicable)				
17	Conditions indicate applicable O&M procedures have been carried out				
Notes:					
OTHER					
18					
19					

Notes:

FOLLOW-UP ACTIONS REQUIRED

Item #s needing attention: _____

Required action(s):

Follow-up inspection date: _____

Inspector Signature: _____ Date: _____

6) Annual Report Template

Wisconsin DNR Water Quality Trading Annual Report

1. Site Inspection Verification

Verification that site inspection occurred	☐ Yes ☐ No
Date of Credit Generation/Inspection	_____
Statement of Findings	Practices functioning and maintained according to O&M plan

2. Deficient Items

Deficient items identified (if applicable):

3. Remedies for Deficient Items

Remedies (how, who, and timeframe for corrections):

4. Credits Available and Used

	Credits Used	Phosphorus Loading	
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Total			

5. Duration of Credit Availability

Duration of phosphorus credit availability (based on design life and maintenance):
--

6. Termination Notices or Registration Changes

Termination notices or practice registration changes:

7. Certification

I certify that the information contained in this report is accurate and complete to the best of my knowledge.

Responsible Party	Mark Baker, Commission President, Spring Green Golf Club Sanitary District #2
Signature	_____
Date	_____

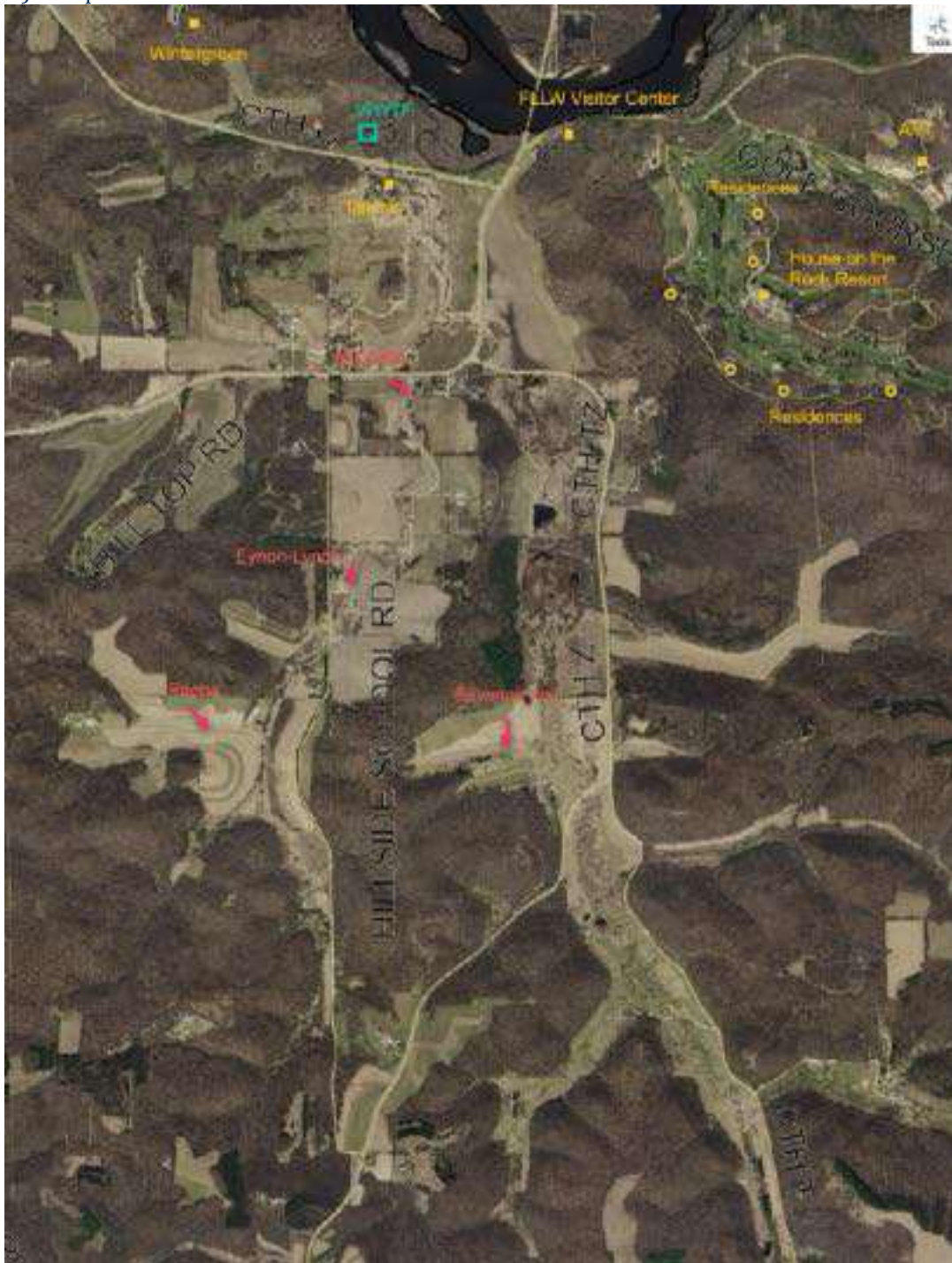
7) Wisconsin DNR Inspections

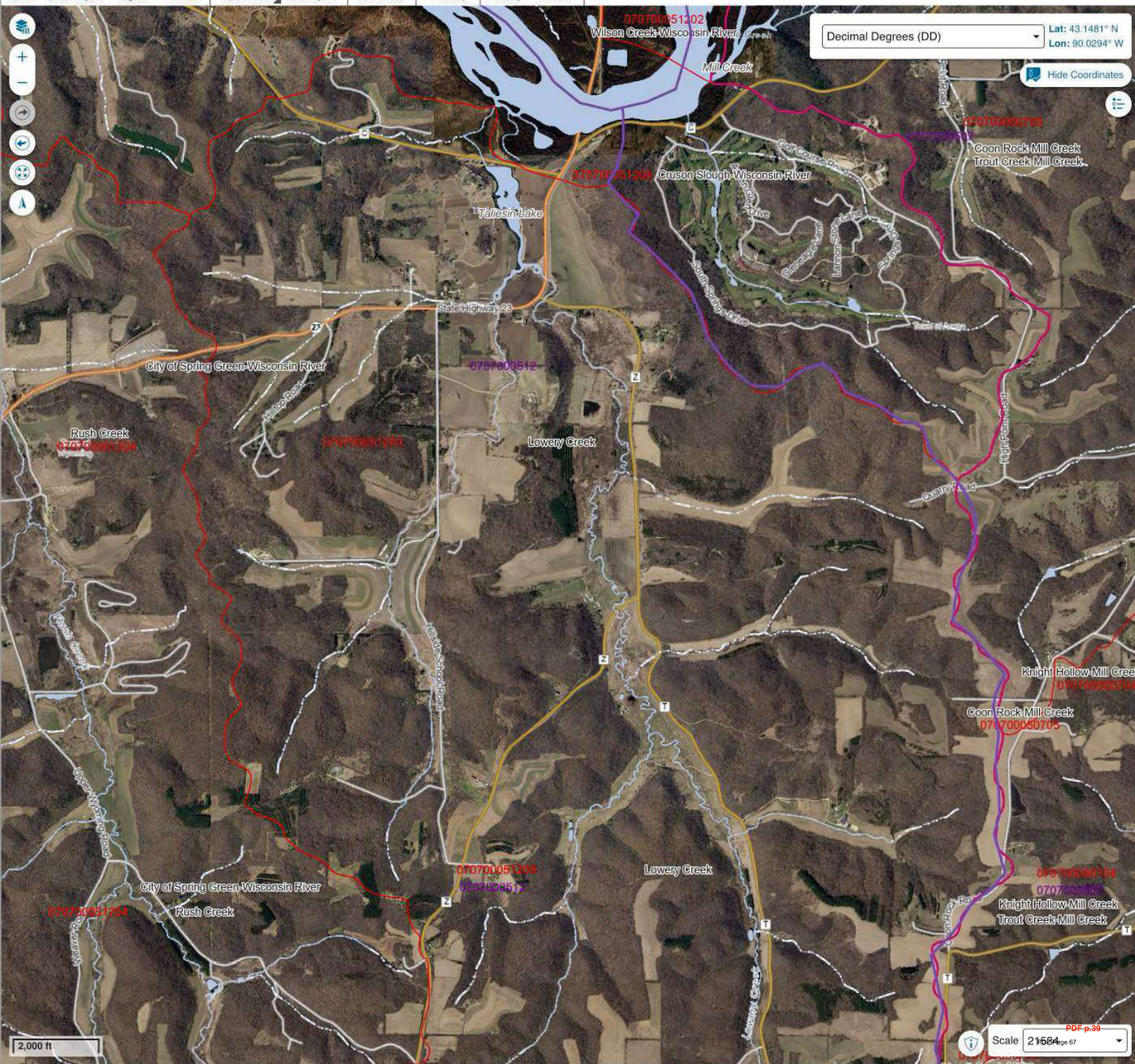
Any WDNR authorized officer, employee, or representative has the right to access and inspect the credit generating practice(s) so long as the trade agreement and this Water Quality Trading Plan remain in effect.

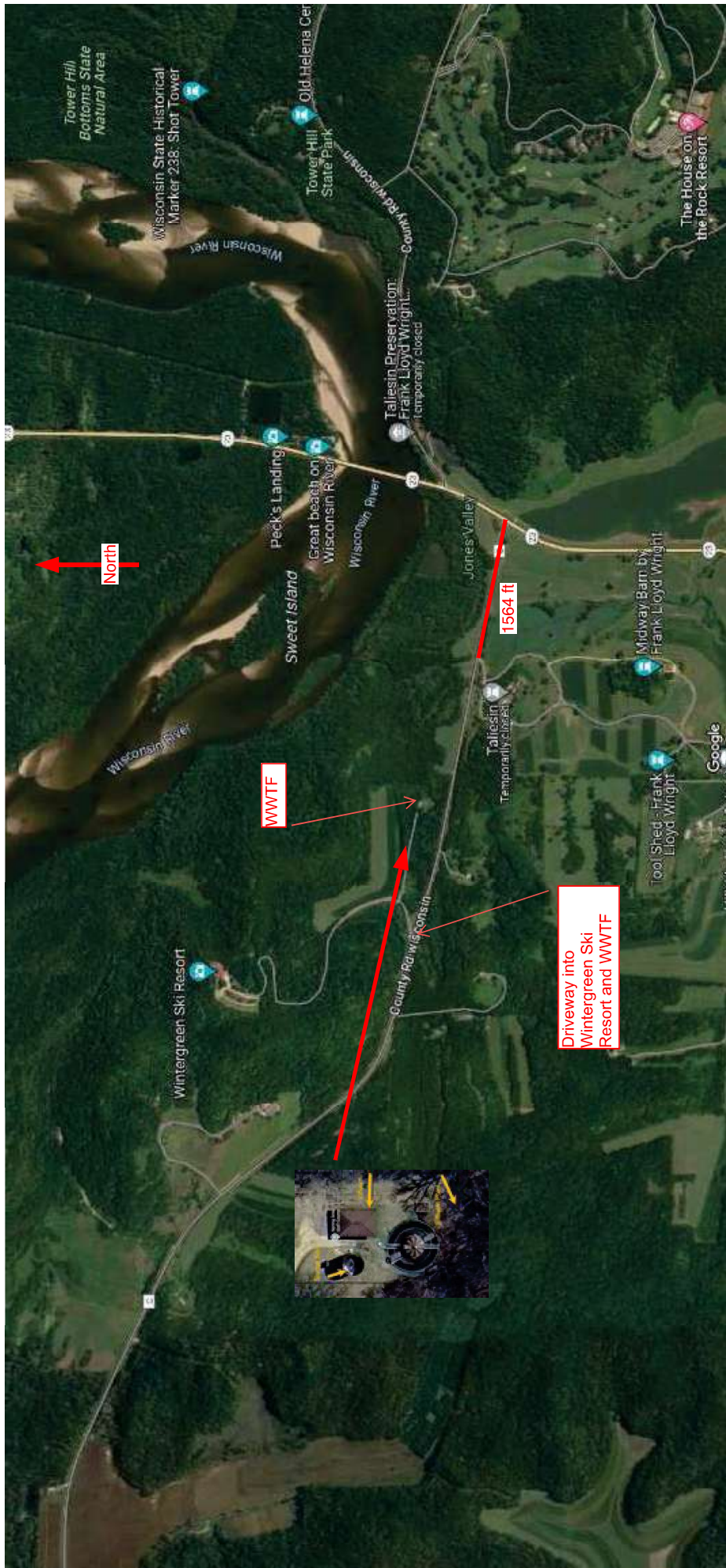
The District will notify WDNR by telephone call to WDNR's regional wastewater compliance engineer within 24 hours or next business day of becoming aware that phosphorus credits used or intended for use by District are not being generated as outlined in this WQT Plan. The District will submit a written notification within five days after the District recognizes that the phosphorus credits are not being generated as outlined in the WQT Plan. WDNR may waive the requirement for submittal for a written notice within five days and instruct the District to submit the written notice with the next regularly scheduled monitoring report required by the District's WPDES Permit.

The written notice will contain a description of how and why the TP credits are not being generated as outlined in the WQT Plan, the steps taken or planned to prevent reoccurrence of the identified problems and the length of time anticipated it will take to address the issue. The District will work to rectify the problem as laid out in the Operation and Maintenance Plans

8) Map of Area and Credit Generation Sites & HUC 12 Watershed

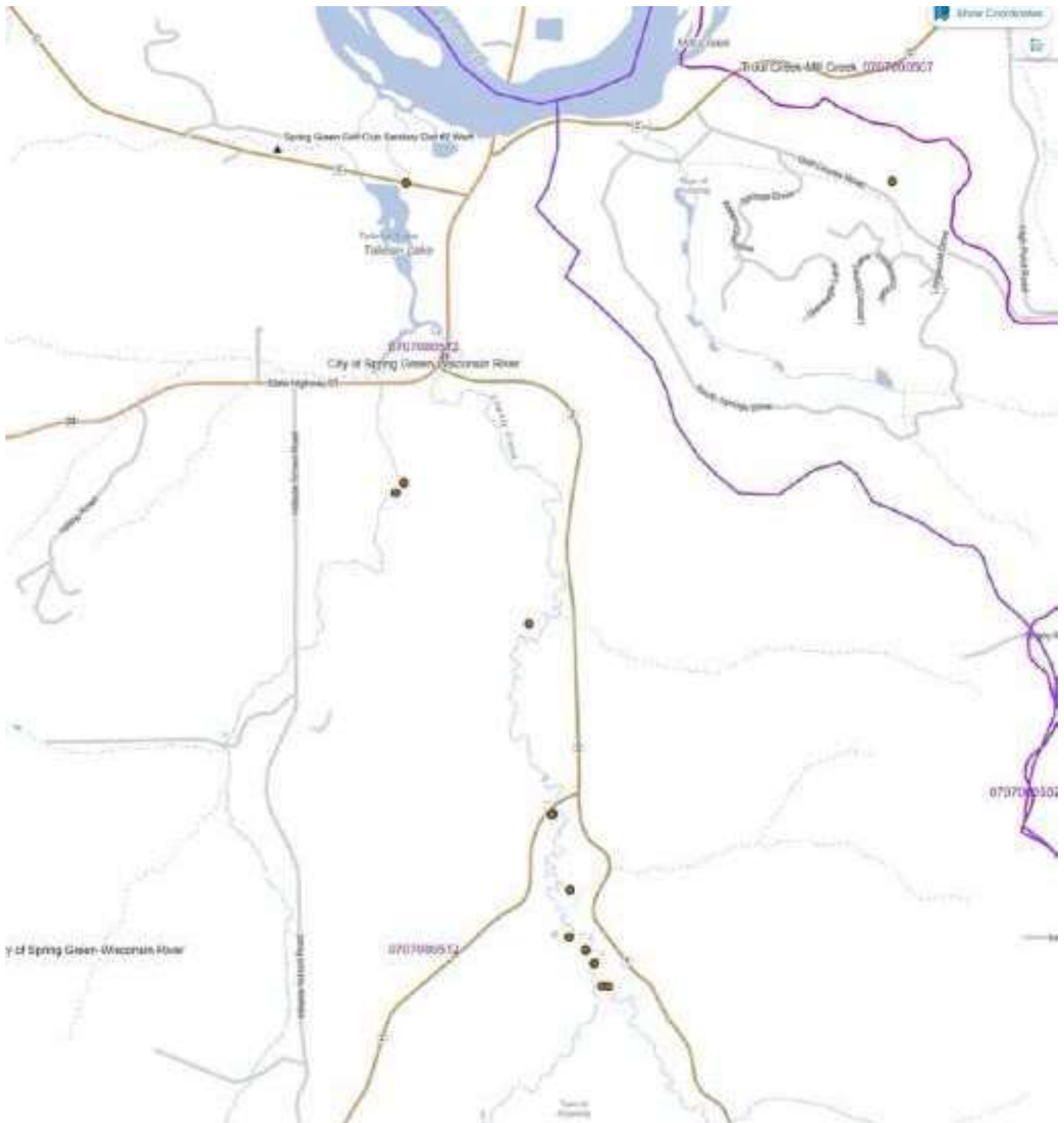




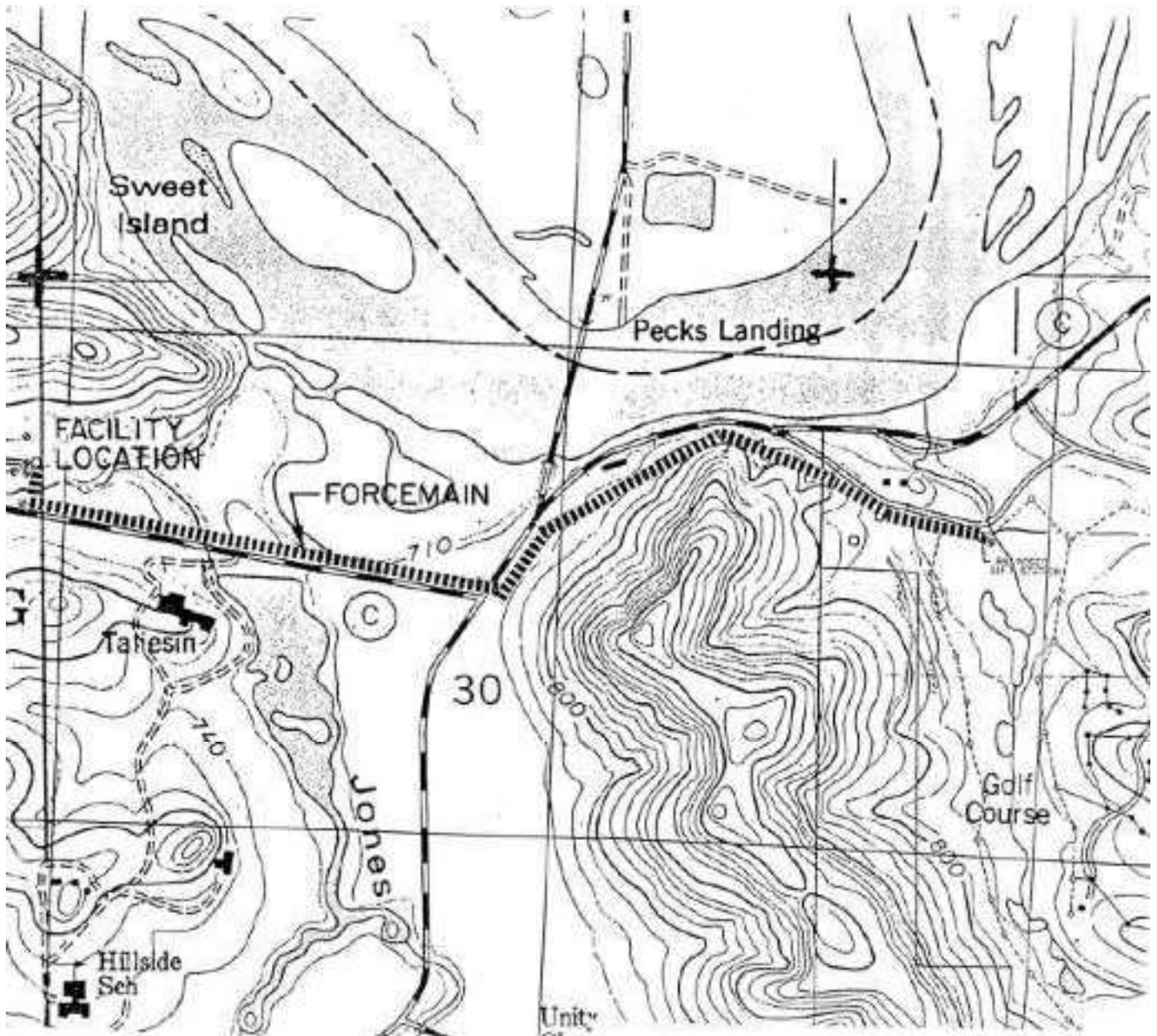


Imagery ©2024 CNES / Airbus, Maxar Technologies, USDA/FPAC/GEO, Map data ©2024 1000 ft

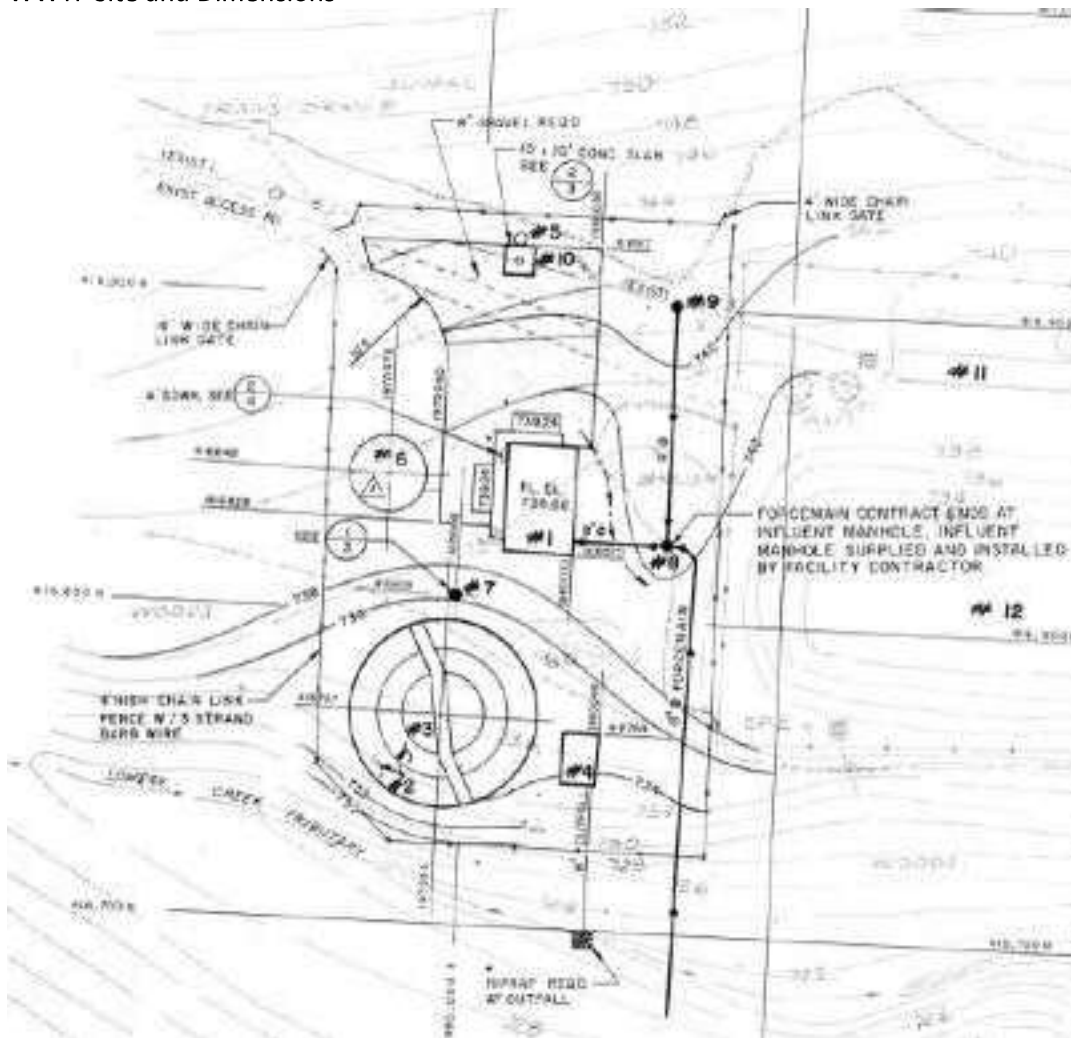
HUC 12 Watershed Map



9) WWTF Site Location Map



WWTF Site and Dimensions



[illegible]

10)Water Quality Trading Summary

Water Quality Trading Plan Summary											
ID	Property Owner	Address	Site	Trade Agreement	Taxkey	Acres	Rotational Average Baseline	Rotational Average Proposed	Reductions	Trade Ratio	WQT Credits Generated
1.1	Pacha	6310 Hillside School Rd	East Prairie	SGGC_SD-LC 1	028-0487, 028-0484	2.5	2.67	1.00	1.87	1.2:1	1.39
1.2	Pacha	6311 Hillside School Rd	Upper Section South	SGGC_SD-LC 1	028-0483	5.1	14.00	4.00	10.00	1.2:1	8.33
2.1	Savanna Institute	6172 Co Rd Z	Field 1	SGGC_SD-LC 2	028-0113	7.1	1.17	1.29	-0.12	1.2:1	0.00
2.2	Savanna Institute	6172 Co Rd Z	Field 2	SGGC_SD-LC 2	028-0112, 028-0116	5.2	4.75	4.67	0.08	1.2:1	0.07
2.3	Savanna Institute	6172 Co Rd Z	Field 3	SGGC_SD-LC 2	028-0118	5.6	5.50	2.67	3.83	1.2:1	3.19
2.4	Savanna Institute	6172 Co Rd Z	Field 4	SGGC_SD-LC 2	028-0118	12.4	0.00	1.22	-1.22	1.2:1	0.00
2.5	Savanna Institute	6172 Co Rd Z	Field 5	SGGC_SD-LC 2	028-0111, 028-0116	15.9	8.75	4.67	4.08	1.2:1	3.40
2.6	Savanna Institute	6173 Co Rd Z	Pasture Conversion	SGGC_SD-LC 2	028-0111, 028-0117	3.0	3.00	1.22	1.78	1.2:1	1.48
3.0	Michaels	6679 State Road 23	Field 7	SGGC_SD-LC 3	028-0057	7.0	7.00	1.00	6.00	1.2:1	5.00
Total							47.84	21.74	26.10		22.87

Note: Savanna Field 7 and Savanna Stapleton Corn are not included in the scope of our Water Quality Trading Plan.

Years used to calculate rotational average for the baseline on a field basis:

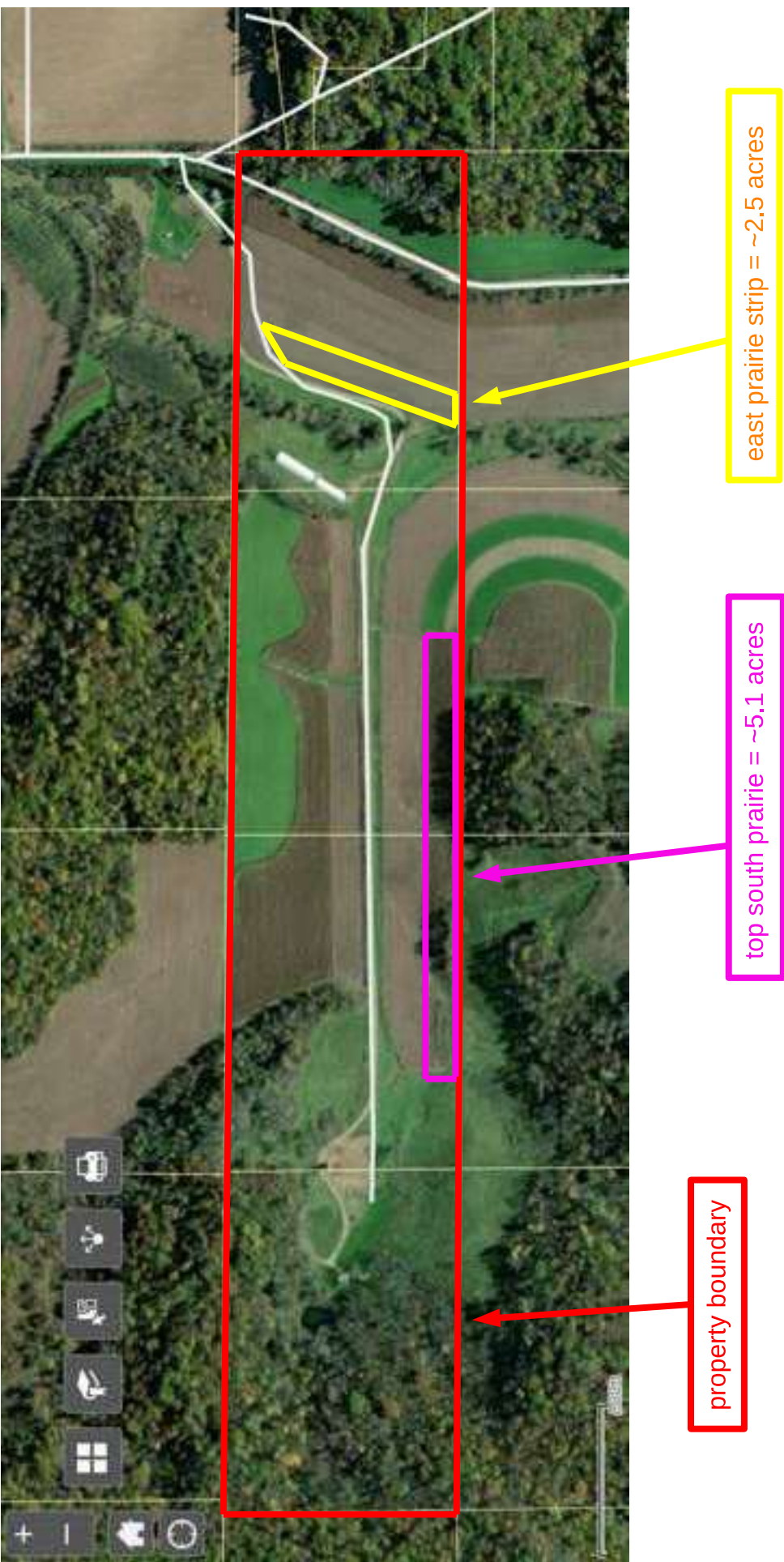
- 1: Baseline 2019-2024 (Alfalfa to Pasture)
- 2: Baseline 2019-2022 (Corn/Soy to Pasture)
- 3: Baseline 2019-2022 (Corn/Soy to Pasture)
- 4: Baseline 2019-2022 (Grass Hay to Pasture)
- 5: Baseline 2019-2026 (Corn/Soy to Alfalfa)
- 7: Baseline 2019-2024 (Corn/Soy to Pasture)
- Pasture Conversion: 2019-2022 (Corn/Soy to Pasture)

Status of owner agreements:

Agreement	Version	Sent	Signature Received
Pacha	v.1.1	6.15.26 revised after WQT Plan update and SnapPlus update	6.30.36
Savanna / Cates	v.1.1	6.15.26 revised after WQT Plan update and SnapPlus update	6.30.26
Michaels	v.1.1	6.15.26 revised after WQT Plan update and SnapPlus update	6.30.26

11) Credit Generation Location #1 Pacha

NMP Baseline Establishment for
6310 Hillside School Rd., Spring Green, WI
Richard Wagner & Danielle Pacha



property boundary

top south prairie = ~5.1 acres

east prairie strip = ~2.5 acres

NM1: Narrative and Crops Report

Starting Year	2020
Reported For	Richard Wagner & Danielle Pacha
Printed	2026-06-04
Plan Completion/Update Date:	2023-03-14
SnapPlus Version	20.4 built on 2021-06-03
C:\Users\sara.wilhelm\OneDrive - Iowa County\Land Conservation - Documents\Technical assistance\P Trading\Phosphorus Trading-Wyoming\Danielle Pacha\NM\Richard Wagner & Danielle Pacha (actual practice) - Copy.snapDb	

Prepared for:
Richard Wagner & Danielle Pacha
attn:Richard Wagner & Danielle Pacha
6310 Hillside School Rd
Spring Green, 53588

Farm has 2 fields totalling 7.6 cropped acres.

Farm Narrative: Plan was created to create a baseline for Wyoming Valley water quality trading project. The field was in continuous corn/soybean rotation at the time of enrollment. Soils were sampled December 2022 prior to practice implementation to establish baseline nutrient levels. Soil samples were conducted at 6in depth by the UW WI Soil and Anaylsis Lab. These baseline results were used to configure the Snap Plus model for credit calculations. No manure of commercial fertilizer applications were made to the field following enrollment.

Annual Farm Notes:

Crop Year	Annual Notes
2023	Native grasses were planted in 2022 in two fields in plan.

Spreader Calibration Methods: Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2020	2021	2022	2023	2024	2025	2026	2027
East Prairie	2.5	Soybeans 30-36 inch row No Till 46-55 bu/acre	Corn grain No Till 171-190 bu/acre	Corn grain No Till 171-190 bu/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre
Upper Section South	5.1	Soybeans 30-36 inch row No Till 46-55 bu/acre	Corn grain No Till 171-190 bu/acre	Corn grain No Till 171-190 bu/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre

Summary by Crop:

NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2020	2021	2022	2023	2024	2025	2026	2027
Corn grain	Acres bu		8 1,444	8 1,444					
Grasslands, permanent, not harvested	Acres none				8 0	8 0	8 0	8 0	8 0
Soybeans 30-36 inch row	Acres bu	8 404							

WQ1: P Trade Report

Reported For	Richard Wagner & Danielle Pacha	
Printed	2026-06-03	
Plan Completion/Update Date	2023-03-14	
SnapPlus Version	20.4 built on 2021-06-03	
C:\Users\sara.wilhelm\OneDrive - Iowa County\Land Conservation - Documents\Technical assistance\P Trading\Phosphorus Trading-Wyoming\Danielle Pacha\NMP\Richard Wagner & Danielle Pacha (actual practice) - Copy.snapDb		

Prepared for:
Richard Wagner & Danielle Pacha
attn:Richard Wagner & Danielle Pacha
6310 Hillside School Rd
Spring Green, 53588

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to <http://dnr.wi.gov/> and type keyword: **Water Quality Trading**

Questions? Please contact
DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP							
Field Name	Soil Series	Soil Symbol	Acres	2020	2021	2022	2023	2024	2025	2026	2027
East Prairie	TODDVILLE	336A	3	3	3	2	1	1	1	1	1
Upper Section South	NORDEN	254D2	5	13	20	9	4	4	4	4	4
Total			8	15	22	11	5	5	5	5	5

LAB #: 4367

Results also available on-line at <http://not available>
lab number: 4367 access code: rtqz

This Report is for:
Rich Wagner

Richard Wagner
5801 Taft St
Middleton, WI 53562

[illegible]

Nutrient application guidelines for pasture make no assumptions about manure/urine deposition. Nutrient credits for manure/urine deposition should be subtracted from these rates.

Recommended rates are the total amount of nutrients to apply (N-P-K), including starter fertilizer.

Because of excessively high P levels, no P_2O_5 fertilizer or manure is recommended on this field.

Year 1,2,3,4: Split nitrogen applications into two to three applications per year.

N.R.=Not required for calculation of lime requirement when soil pH is 6.6 or higher.

	Very Low	Low	Optimum	High	Very High	Excessive
Phosphorus	P	P	P	P	P	P
Potassium	K	K	K	K	K	K
Rotation pH	X	X	X	X	X	X

[illegible]

12)Credit Generation Location #2 Savanna Institute



WQ1: P Trade Report

Reported For	Savanna Institute - Hagan	
Printed	2025-12-01	
Plan Completion/Update Date	2024-10-25	
SnapPlus Version	20.4 built on 2021-06-03	
C:\Users\howebm\Desktop\Savanna Institute - Hagan3 (Reviewed and Edited by Landon for SNAP+ Accuracy) (9-29-25).snapDb		

Prepared for:
Savanna Institute - Hagan
attn:Savanna Institute - Hagan

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

Questions? Please contact
DNRphosphorus@wisconsin.gov

For more information go to <http://dnr.wi.gov/> and type keyword: **Water Quality Trading**

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report						PTP									
Field Name	Soil Series	Soil Symbol	Acres	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
1	CHURCHTOWN	116D2	7	1	1	1	1	2	1	1	1	1	1	1	
2	CHURCHTOWN	116D2	5	8	3	2	6	29	8	1	1	1	1	1	
3	NORDEN	254D2	6	10	5	3	8	11	4	1	2	2	1	1	
4	URNE	255E2	12	0	0	0	0	3	1	1	1	1	1	1	
5	ETTRICK	629A	16	11	10	8	9	8	7	9	8	6	5	4	
7	ORION	628A	1	1	1	1	1	1	1	1	1	1	0	0	
pasture conversion	NORDEN	254D2	4	5	2	1	4	6	2	0	1	1	1	0	

PTP	
2030	2031
2	2
0	0
1	1
1	1
3	2
0	0
0	0

P Trade Report					PTP									
Field Name	Soil Series	Soil Symbol	Acres	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Stapleton Corn	ORION	628A	3	2	2	1	2	1	1	2	1	1	1	1
Total			54	39	23	17	30	60	25	15	14	11	10	9

PTP	
2030	2031
0	0
8	7

NM1: Narrative and Crops Report

Starting Year	2021
Reported For	Savanna Institute - Hagan
Printed	2025-12-02
Plan Completion/Update Date:	2024-10-25
SnapPlus Version	20.4 built on 2021-06-03
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Prepared for:
Savanna Institute - Hagan
attn:Savanna Institute - Hagan

Farm has 8 fields totalling 53.7 cropped acres.

Farm Narrative: Field 6 was not included in the trade as there were no soil samples associated with it

Field 3 bordered the entire length of field 4 until 2023. In 2023 part of field 3 (pasture conversion) was seeded down to continuous pasture.

Annual Farm Notes:

Crop Year	Annual Notes
2025	8/4/25 Notes: Field 3, and field 5 boundaries were adjusted to match description provided by Eric Cates. "Stapleton Corn" was added as its own separate field (acreage that was subtracted from the previously larger field 3), and planned out through 2031 to match the rotation field 5 is going to follow according to the description provided by Savannah Institute, does this seem correct? Field 3 cropping history was also updated to match that of Field "Pasture Conversion", as grazer indicated this field is currently in a grazing rotation. This plan has been updated to reflect current grazing conditions as expressed by the manager of the grazing herd. This consisted of 25 cows average 1,000 lbs being present for an estimated 180 days, applying equal grazing pressure to 74.2 acres around this farm. This averages out to a grazing manure application rate of 2.5 tons acre, accounted for on defined fields in this plan. Remaining grazing manure unaccounted for in this plan was applied via grazing to pre-existing pasture acreage outside the boundaries of the fields identified in this plan and are not at this time included in this phosphorus loss reduction accounting exercise. This year's plan has been updated to reflect planned future grazing conditions as expressed by the manager of the grazing herd. This will consist of 50 cows average 1,000 lbs being present for an estimated 180 days, applying equal grazing pressure to 74.2 acres. This averages out to a grazing manure application rate of 5 tons acre, accounted for on defined fields in this plan. Remaining grazing manure unaccounted for in this plan was applied via grazing to pre-existing pasture acreage outside the boundaries of the fields identified in this plan and are not at this time included in this phosphorus loss reduction accounting exercise.
2026	8/4/25 Notes: Fields Stapleton Corn, and 5 are planned here to be transitioned to alfalfa/grass and out of row cropping. This continues to apply the updated expected grazing conditions as expressed by the manager of the grazing herd. This consisted of 50 cows average 1,000 lbs being present for an estimated 180 days, applying equal grazing pressure to 74.2 acres. This averages out to a grazing manure application rate of 5 tons acre, accounted for on defined fields in this plan. Remaining grazing manure unaccounted for in this plan was applied via grazing to pre-existing pasture acreage outside the boundaries of the fields identified in this plan and are not at this time included in this phosphorus loss reduction accounting exercise.
2027	8/4/25 Notes: Fields Stapleton Corn, and 5 are planned here to be transitioned to alfalfa/grass and out of row cropping. This continues to apply the updated expected grazing conditions as expressed by the manager of the grazing herd. This consisted of 50 cows average 1,000 lbs being present for an estimated 180 days, applying equal grazing pressure to 74.2 acres. This averages out to a grazing manure application rate of 5 tons acre, accounted for on defined fields in this plan. Remaining grazing manure unaccounted for in this plan was applied via grazing to pre-existing pasture acreage outside the boundaries of the fields identified in this plan and are not at this time included in this phosphorus loss reduction accounting exercise.

2028	This continues to apply the updated expected grazing conditions as expressed by the manager of the grazing herd. This consisted of 50 cows average 1,000 lbs being present for an estimated 180 days, applying equal grazing pressure to 74.2 acres. This averages out to a grazing manure application rate of 5 tons acre, accounted for on defined fields in this plan. Remaining grazing manure unaccounted for in this plan was applied via grazing to pre-existing pasture acreage outside the boundaries of the fields identified in this plan and are not at this time included in this phosphorus loss reduction accounting exercise. Animals were not planned here to graze on crops in "Stapleton Corn" or "5"
------	---

Spreader Calibration Methods: Custom applications, Equipment calibration, Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
1	7.1	Alfalfa/Grass None 3.6-4.5 ton/acre	Alfalfa (grassy, yr 3+) None 3.6-4.5 ton/acre	Alfalfa (grassy, yr 3+) None 3.6-4.5 ton/acre	Alfalfa (grassy, yr 3+) None 3.6-4.5 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 3.1-4 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 3.1-4 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 3.1-4 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 3.1-4 ton/acre
2	5.2	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 171-190 bu/acre	Pasture seeding, grass/legume Spring Chisel, disked 0.5-1.9 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre
3	5.6	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 171-190 bu/acre	Pasture seeding, grass/legume No Till 0.5-1.9 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre
4	12.4	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Pasture seeding, grass/legume No Till 0.5-1.9 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
5	15.9	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Alfalfa/Grass Seeding Spring No Till 1.0-2.5 ton/acre	Alfalfa/Grass None 4.6-5.5 ton/acre
7	1.4	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 171-190 bu/acre	Corn grain No Till 171-190 bu/acre	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Pasture seeding, grass/legume No Till 0.5-1.9 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre
pasture conversion	3.6	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 171-190 bu/acre	Pasture seeding, grass/legume No Till 0.5-1.9 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre	Hay (1st cut) to Pasture, rotational stocking, grass/legume None 2-3 ton/acre
Stapleton Corn	2.9	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop No Till, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop No Till, cover crop no till 191-210 bu/acre	Alfalfa Seeding Spring No Till 1.0-2.5 ton/acre	Alfalfa/Grass None 4.6-5.5 ton/acre

Summary by Crop:**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

Crops Grouped By Category	2021	2022	2023	2024	2025	2026	2027	2028
Alfalfa (grassy, yr 3+)	Acres ton	7 28	7 28	7 28				
Alfalfa/Grass	Acres ton	7 28						19 96
Hay (1st cut) to Pasture, rotational stocking, grass/legume	Acres ton			27 68	34 121	35 124	35 124	35 124

Crops Grouped By Category		2021	2022	2023	2024	2025	2026	2027	2028
Corn grain to small grain cover crop	Acres bu		35 6,318	19 3,810		19 3,810	19 3,810		
Pasture seeding, grass/legume	Acres ton			27 32		1 1			
Soybeans to small grain cover crop	Acres bu	35 2,118			20 1,210				
Grass hay	Acres ton	12 30	12 30						
Alfalfa/Grass Seeding Spring	Acres ton							16 28	
Corn grain	Acres bu			1 181					
Alfalfa Seeding Spring	Acres ton							3 5	

Otter Creek, Taliesin Taliesin - Soil Sampling - 2021





TraceCHEM™



GROWER

Older Creek Organic Farms



FARM

Taliesin



FIELD

North & South



ORDER NUMBER

6089871



COMPLETED SAMPLES

65



DATE RECEIVED

11/29/2021



DATE COMPLETED

12/02/2021



CROP

Corn

Tube ID	Sample Name	Sample Depth (in)	pH	Buffered pH	DM (% Mass)	PO ₄ -P (ppm)		Mehlich-3		Mehlich-3 (ppm)							
						Bray	Cohen	K	S	Zn	Na	Ca	Mg	Ky	Cu	Mn	B
142437	33	0-6	6.9	7.1	4.3	122.0	60.6	229.7	7.0	11.4	8.0	3299.6	390.5	178.7	3.7	97.4	1.4
142443	34	0-6	7.1	7.2	4.3	161.0	76.0	345.6	8.0	13.0	9.6	4265.2	551.3	267.1	5.5	55.3	2.0
142431	35	0-6	7.4	7.4	3.5	223.0	79.4	460.2	7.9	20.0	9.7	3830.6	706.1	179.0	5.0	103.0	1.7
142411	36	0-6	5.6	6.7	2.8	20.5	6.0	36.9	16.0	2.6	3.2	1181.3	304.5	170.7	2.1	96.3	0.6
142437	37	0-6	7.5	7.5	2.1	None	14.0	103.5	10.5	16.6	2.3	3357.6	857.7	226.8	2.1	171.0	1.2
142449	38	0-6	6.7	7.0	3.7	54.7	22.4	76.6	8.0	9.0	3.5	2311.3	621.3	157.6	2.7	125.0	0.8
142419	39	0-6	6.1	6.8	3.8	43.5	19.0	53.5	10.4	5.0	1.9	1188.4	426.3	140.0	2.2	127.3	0.7

142437

Tube ID	Sample Name	CEC (meq/100g)	Nitrogen (ppm)		% Base Saturation			Electrical Conductivity (dS/m)		DTPA Zn Regression (ppm)		Carbon	
			Nitrate	Ammonium	K	Mg	Ca	Na				TOC (%)	Active (ppm)
142457	33	18.1			2.0	17.7	79.2	0.1		4.5			
142443	34	24.1			3.0	19.0	77.7	0.2		4.9			
142431	35	23.5			2.6	26.2	71.9	0.2		7.1			
142411	36	11.7			2.7	21.8	44.6	0.1		1.3			
142437	37	10.9			1.9	35.0	62.9	0.1		5.7			
142449	38	15.7			2.2	33.0	64.8	0.1		3.6			
142419	39	14.3			3.4	24.8	55.0	0.1		2.5			



TraceCHEM™

GROWER
Oliver Creek Organic Farms

COMPLETED SAMPLES
65

FARM
Talesim

DATE RECEIVED
11/29/2021

FIELD
North & South

DATE COMPLETED
12/02/2021

ORDER NUMBER
6089871

CROP
Corn

Tube ID	Sample Name	Sample Depth (in)	pH	Buffered pH	OM (% Mass)	PO ₄ -P (ppm)			Method-3 ICP (ppm)									
						Broy	Disen	Method-3	K	S	Zn	Na	Ca	Mg	Fe	Cu	Mn	B
142453	40	0.6	6.3	6.8	3.4	28.2	14.3	37.5	62.4	7.7	5.0	3.7	1066.4	458.4	121.7	8.7	97.2	0.6
142458	41B0	0.6	2.2	7.3	3.3	51.0	25.0	79.7	102.2	9.2	5.5	3.6	2704.3	764.6	203.0	3.5	165.2	1.3
142444	42	0.6	6.5	7.0	6.5	44.2	25.6	61.3	129.3	8.1	7.6	4.2	2869.1	810.0	190.5	3.2	126.2	1.2
142437	43	0.6	6.1	6.8	4.8	102.0	59.2	135.5	242.2	7.6	6.3	5.6	2481.4	639.2	303.3	3.5	41.7	1.1
142417	44	0.6	5.8	7.0	4.5	54.7	29.4	77.2	104.7	7.7	7.4	9.2	3332.0	858.1	235.6	4.3	83.4	1.0
142438	45	0.6	6.1	6.9	3.0	11.1	5.1	18.2	49.6	7.9	4.4	12.3	1407.7	371.0	382.8	1.8	356.5	0.7
142450	46	0.6	6.6	7.1	2.7	7.3	4.0	12.2	55.2	6.1	3.7	6.6	1372.1	424.2	301.2	1.7	191.2	0.7

Tube ID	Sample Name	CEC (meq/100g)	Nitrogen (ppm)		% Base Saturation			Electrical Conductivity (dS/m)		DTM Zn Regression (ppm)		Carbon	
			Nitrate	Ammonium	K	Mg	Ca	Na				TOC (%)	Active (ppm)
142453	40	14.7			1.1	26.6	55.9	0.1		2.2			
142458	41B0	18.9	13.6	2.2	1.4	33.7	64.8	0.1		3.6			
142444	42	19.7			1.7	34.2	68.0	0.1		1.2			
142432	43	19.3			3.2	27.6	56.6	0.1		2.8			
142412	44	21.2			1.3	33.7	64.9	0.2		2.9			
142438	45	10.7			1.2	29.0	58.1	0.5		2.5			
142450	46	9.7			1.5	36.3	62.0	0.3		1.5			



TraceCHEMSM

GROWER
Otter Creek Organic Farms



FARM
Talliesin

FIELD
North & South



ORDER NUMBER
6089871

COMPLETED SAMPLES
65



DATE RECEIVED
11/29/2021



DATE COMPLETED
12/02/2021



CROP
Corn

Tube ID	Sample Name	Sample Depth (in)	pH	Buffered pH	OM (% Mass)	PO ₄ -P (ppm)		Mehlich-3 (ppm)						
						Bray	Olsen	Mehlich-3	K	S	Zn	Na	Ca	Mg
142400	47	0.6	6.4	6.9	3.2	8.2	4.0	12.6	58.3	7.3	2.9	10.1	3300.6	343.4
142404	48	0.6	6.4	7.0	2.3	72.6	15.4	86.3	67.8	7.1	3.1	3.4	816.8	224.7
142408	49	0.6	6.3	7.0	2.9	38.3	7.4	35.2	55.6	12.2	3.2	4.1	3454.7	424.4
142402	50	0.6	7.0	7.2	3.2	15.1	9.2	21.5	84.9	11.7	2.9	5.2	1801.2	519.6
142404	51	0.6	6.8	7.2	2.7	11.8	5.4	19.5	40.9	9.3	3.7	4.5	1478.4	467.7
142413	52	0.6	7.4	7.4	3.3	17.0	9.2	26.8	79.8	12.8	4.3	3.4	1837.6	524.0
142406	53	0.6	6.4	7.1	2.6	10.0	4.8	14.8	125.9	9.2	4.9	2.8	1065.1	261.5

Tube ID	Sample Name	CEC (meq/100g)	Nitrogen (ppm)		% Base Saturation			Na	Electrical Conductivity (dS/m)	DTM, Zn Regression (ppm)	Carbon	
			Nitrate	Ammonium	K	Mg	Ca				TOC (%)	Active (ppm)
142410	47	10.5			1.4	11.1	55.6	0.4		1.2		
142454	48	5.7			3.1	33.1	63.6	0.3		1.3		
142459	49	10.1			1.4	35.8	63.4	0.2		1.4		
142462	50	13.3			1.6	38.7	59.4	0.2		1.1		
142404	51	10.5			1.9	37.0	61.8	0.2		1.4		
142413	52	14.8			1.5	37.3	61.1	0.1		1.3		
142406	53	7.2			4.5	30.2	65.1	0.2		2.1		



TraceCHEM™

GROWER
Otter Creek Organic Farms



FARM
Talesin



FIELD
North & South



CROPP NUMBER
6089971

COMPLETED SAMPLES
65



DATE RECEIVED
11/29/2021



DATE COMPLETED
12/22/2021



CROP
Corn

Tube ID	Sample Name	Sample Depth (in)	pH	Buffered pH	OM (% Mass)	PO ₄ -P (ppm)		Mehlich-3 (ppm)						
						Bray	Olsen	Mehlich-3	K	S	Zn	Na	Ca	Mg
142451	54	0.6	5.9	6.8	2.9	20.7	9.0	28.0	113.3	8.2	4.0	3.5	1400.6	404.2
142421	55BIO	0.6	5.1	6.9	3.4	37.6	18.4	53.0	305.1	10.7	4.3	2.7	1853.0	407.6
142455	56	0.6	5.5	7.0	3.5	39.0	18.8	45.3	210.2	8.2	4.2	2.8	1662.1	428.4
142460	57	0.6	5.2	6.9	4.1	21.5	11.1	39.9	193.1	10.7	7.0	2.5	1549.2	438.6
142463	58	0.6	6.0	6.9	2.6	32.0	19.8	45.5	344.5	9.5	9.6	3.5	1336.1	402.9
142465	59	0.6	5.4	7.0	3.4	23.7	10.2	35.3	77.9	8.0	4.5	3.9	1642.3	426.9
142414	60	0.6	6.9	7.2	2.9	9.4	4.2	20.6	39.6	9.0	3.1	9.6	1518.1	425.5

Tube ID	Sample Name	CEC (meq/100g)	Nitrogen (ppm)		% Base Saturation			Na	Electrical Conductivity (dS/m)	DTPA Zn Absorption (ppm)	Carbon	
			Nitrate	Ammonium	K	Mg	Ca				TOC (%)	Active (ppm)
142451	54	12.3			2.4	27.4	59.5	0.1		1.8		
142421	55BIO	13.6	9.0	4.3	5.8	25.1	60.2	0.1		1.9		
142451	56	11.4			4.2	31.2	61.0	0.1		2.0		
142460	57	13.9			3.8	29.2	61.5	0.1		3.1		
142463	58	11.7			3.2	29.7	57.8	0.1		2.1		
142465	59	11.0			1.8	32.3	65.7	0.2		1.9		
142414	60	10.6			1.0	34.2	61.6	0.4		1.3		



TraceCHEM™



GROWER

Other Creek Organic Farms



FARM

Tarleson



FIELD

North & South



ORDER NUMBER

6089871



COMPLETED SAMPLES

65



DATE RECEIVED

11/29/2021



DATE COMMITTED

12/02/2021



CROP

Corn

Tube ID	Sample Name	Sample Depth (in)	pH	Buffered pH	OM (% Mass)	PO ₄ -P (ppm)		Merlett-3 ICP (ppm)				
						Bray	Olsen	Merlett-3	K	S	Zn	Na
142467	61	0-6	7.1	7.2	3.6	12.6	6.4	31.5	50.5	8.7	3.8	22.7
142468	62	0-6	6.1	6.9	2.7	4.9	2.9	11.5	22.8	6.6	3.5	8.1
142469	63	0-6	6.9	7.2	3.0	5.3	3.2	9.6	30.7	6.5	3.6	6.7
142470	64	0-6	7.1	7.3	2.9	4.1	4.3	8.7	45.0	6.5	2.6	1.3
142471	65	0-6	6.3	7.0	2.5	6.3	3.3	10.1	48.4	7.0	1.9	11.7

Tube ID	Sample Name	CEC (meq/100g)	Nitrogen (ppm)		% Base Saturation			Electrical Conductivity (dS/m)	DTPA Zn Regression (ppm)		Carbon	
			Nitrate	Ammonium	K	Mg	Ca				TOC (%)	Active (ppm)
142467	61	14.3			1.1	35.3	63.3		1.4			
142468	62	8.6			0.8	27.6	37.3		1.6			
142469	63	7.9			1.0	37.3	61.4		1.4			
142470	64	10.5			1.1	33.2	65.5		1.4			
142471	65	8.0			1.3	33.8	64.2		0.8			



CROP
Corn



GROWER
Otter Creek Organic Farms



FARM
Tallesin



FIELD
North & South



SAMPLE DATE
11/19/2021

TraceBIO™

Nutrient Cycling Indicator Report

Sample Name	Sample Date	Test	Crop	Bacterial Diversity	Denitrification Potential	Nitrate Ammonification Potential	Nitrification Potential	Oxygen Availability	Prebiotic Mineralization Potential	Prebiotic Sequestration Potential
16890	11/19/21		Corn	1386.9	0.4	0.19	0.29	64.72	0.67	1.16
41890	11/19/21		Corn	1001.63	0.44	0.25	0.29	59.96	0.72	1.01
53890	11/19/21		Corn	1399.96	0.19	0.14	0.39	63.84	0.55	1.08
* All measurements are unitless.										
Legend				<55.09	>0.49	<0.11	>0.26	<63.72	<0.36	<0.89
				>55.11	<0.39	>0.18	<0.22	>63.37	>0.59	>1.32



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TraceBIO™

Nutrient Cycling Indicator Report

Indicator

Definition

Bacterial Diversity

- The bacterial diversity indicator is a unitless index that takes into account the number of species present (richness) as well as the relative abundance of each species (balance or evenness).
- This diversity indicator includes both bacteria and archaea, which are classified as prokaryotes and both are typically unicellular organisms. Certain soil processes are carried out either by bacteria or archaea or both. For example, both groups are involved in nitrification. To ease communication we use the term "bacterial" diversity instead of "prokaryotic" diversity, as the former is more familiar to most users.
- Bacterial diversity is expected to be higher at moderate soil pH (not very acidic nor very alkaline) and in soils that experience minimal disturbances, such as no till. Bacterial diversity also tends to increase with decreasing soil moisture content.

Bacterial Diversity

Nitrate (NO_3^-) $\rightarrow$ Dinitrogen/Nitrous Oxide ($\text{N}_2/\text{N}_2\text{O}$)

- Denitrification is a process where specific soil organisms convert nitrate to gaseous forms of nitrogen.
- The Denitrification indicator represents the abundance of genes belonging to denitrifying organisms and are specifically involved in these nitrogen transformation processes.
- This form of loss mainly occurs in waterlogged soils with reduced oxygen availability. Addressing the source of waterlogging or making multiple in-season nitrogen applications are ways to mitigate nitrogen loss through denitrification.

Denitrification Potential

Nitrate (NO_3^-) $\rightarrow$ Ammonium (NH_4^+)

- The Nitrate ammonification indicator represents the abundance of genes belonging to organisms that have the capability of converting nitrate to ammonium.
- This process can contribute to nitrogen retention by counteracting nitrogen loss from leaching or denitrification, particularly under low oxygen conditions and at higher soil pH.
- This process is also known as Dissimilatory Nitrate Reduction to Ammonium (DNRA).

Nitrate Ammonification Potential

Indicator

Definition

Ammonium (NH_4^+) $\rightarrow$ Nitrate (NO_3^-)

- Nitrification is a process where specific soil microorganisms convert ammonium to nitrate, which is the form of nitrogen that is most susceptible to loss.
- The Nitrification indicator represents the abundance of genes belonging to nitrifying organisms and which are specifically involved in this process.
- The Oxygen availability indicator reflects the oxygen status of the soil by quantifying the amount of organisms that are adapted to low oxygen levels.
- This indicator gives us insight into the porosity and waterlogging of soil and contributes to the interpretation of other microbial indicators that are sensitive to oxygen, such as Denitrification.

Oxygen Availability

Organic Phosphorus $\rightarrow$ Phosphate (PO_4^{3-})

- The Phosphorus mineralization indicator represents the abundance of genes belonging to organisms that release available phosphorus from organic forms.
- This allows phosphorus that is stored in soil organic matter to be added to the plant-available pool.

Phosphorus Mineralization Potential



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Nutrient Cycling Indicator Report

Indicator

Phosphorus Solubilization Potential

Definition

Non-Labile Phosphate (PO_4^{3-}) → Plant-Available Phosphate (PO_4^{3-})

- The Phosphorus solubilization indicator represents the abundance of genes belonging to organisms that are involved in the process of liberating phosphate from soil minerals.
- This allows previously plant-unavailable phosphorus to be added to the plant-available pool.

PDF p.73

FM6: Soil Test Report

Reported For	Savanna Institute - Hagan	
Printed	2025-07-31	
Plan Completion/Update Date	2024-10-25	
SnapPlus Version 20.4 built on 2021-06-03		
C:\Users\sara.wilhelm\OneDrive - Iowa County\Phosphorus Trade Savanna Institute - Hagan3 (Reviewed and Edited by Landon for SNAP+ Accuracy) (1).snapDb		

Prepared for:
Savanna Institute - Hagan
attn:Savanna Institute - Hagan

Field Name	Subfarm	Acres	Predominant		Soil Test Date	Soil Test Lab	Lab Number	Samples		pH	OM%	in ppm		
			Soil Map Symbol	Soil Name				Rec. #	Actual #			P	K	S
1		7.1	116D2	CHURCHTOWN	2021-11-29			1	4	6.4	2.8	9	58	7.1
2		5.2	116D2	CHURCHTOWN	2021-11-29			1	3	6.7	2.9	15	48	11.1
3		10.2	254D2	NORDEN	2021-11-29			2	8	6.4	3.2	21	123	9.7
4		12.4	255E2	URNE	2021-11-29			2	6	6.7	2.9	6	41	7.4
5		17.2	629A	ETTRICK	2021-11-29			3	8	6.9	3.5	43	100	9.7
pasture conversion		3.6	254D2	NORDEN	2025-02-27			1	2	6.9	3.0	14	103	0

Crop Year Soil Test Needed

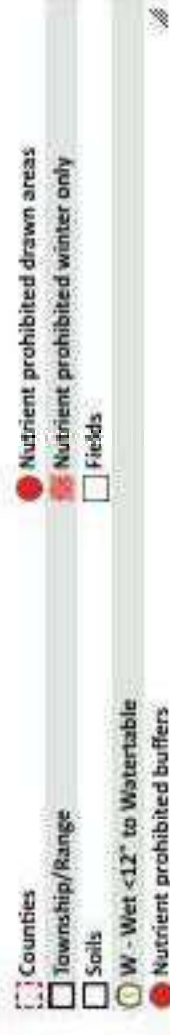
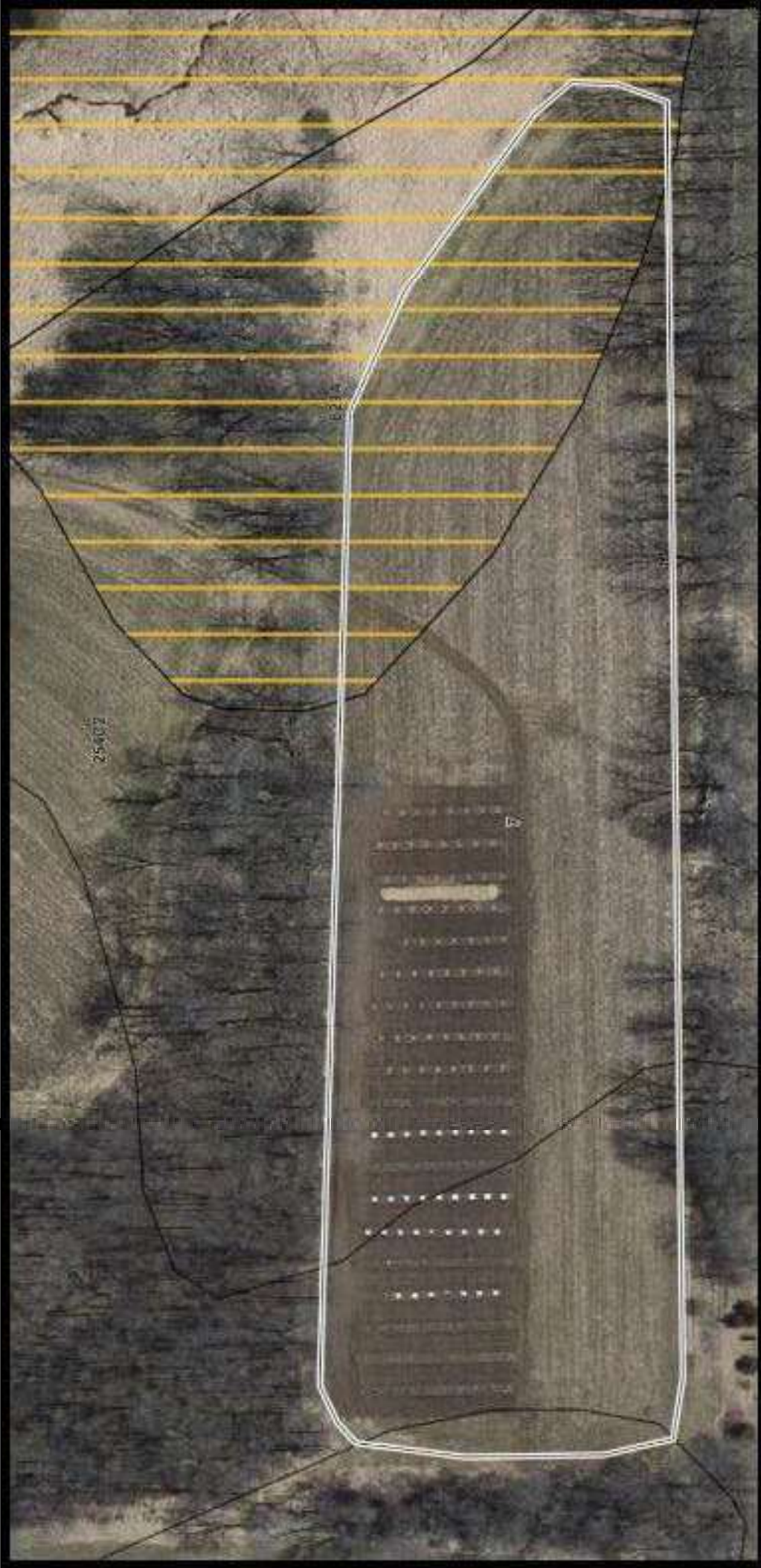
Field Name	Soil Test Date	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	2021-11-29						X					
2	2021-11-29						X					
3	2021-11-29						X					
4	2021-11-29						X					
5	2021-11-29						X					
pasture conversion	2025-02-27									X		

13)Credit Generation Location #3 Michaels



Patrick Michaels Soils

Farm: Patrick Michaels, V18 Generated:8/25/2025, Crop year: 2025, Township Range Section:8N 4E s31



NM1: Narrative and Crops Report

Starting Year	2021
Reported For	Patrick Michaels
Printed	2025-08-25
Plan Completion/Update Date:	2023-06-09
SnapPlus Version	20.4 built on 2021-06-03
C:\Users\sara.wilhelm\OneDrive - Iowa County\Wyoming Phosphorus Trade\Patrick Michaels.snapDb	

Prepared for:
Patrick Michaels
attn:Patrick Michaels
6679 State Road 23
Spring Green, 53588

Farm has 1 fields totalling 3.8 cropped acres.
Farm Narrative: Plan was created to create a baseline for Wyoming Valley water quality trading project.

Annual Farm Notes:

Crop Year	Annual Notes
2023	Field has been in a corn-cover crop rotation. Being converted into an orchard in 2023.

Spreader Calibration Methods: Custom applications

Narrative and Crops:

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027
7	3.8	Corn grain Spring MB Plow 131-150 bu/acre	Winter Rye (grain +straw) to interseeded red clover cover crop Field Cultivation 31-50 bu/acre	Sod, seeding, spring Disk 0-0 ton/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre	Grasslands, permanent, not harvested None 0-0 none/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2021	2022	2023	2024	2025	2026	2027
Corn grain	Acres bu	4 562						

Crops Grouped By Category	2021	2022	2023	2024	2025	2026	2027
Grasslands, permanent, not harvested	Acres none			40	40	40	40
Sod, seeding, spring	Acres ton		40				
Winter Rye (grain +straw) to interseeded red clover cover crop	Acres bu	4162					

WQ1: P Trade Report

Reported For	Patrick Michaels	
Printed	2025-08-20	
Plan Completion/Update Date	2023-06-09	
SnapPlus Version	20.4 built on 2021-06-03	
C:\Users\Isara.wilhelm\OneDrive - Iowa County\Phosphorus Trade Patrick Michaels.snapDb		

Prepared for:
Patrick Michaels
attn:Patrick Michaels
6679 State Road 23
Spring Green, 53588

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to <http://dnr.wi.gov/> and type keyword: **Water Quality Trading**

Questions? Please contact
DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report					PTP								
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
7	NORDEN	254C2	4	11	38	10	37	10	7	3	1	1	0
Total			4	11	38	10	37	10	7	3	1	1	0

FM6: Soil Test Report

Reported For	Patrick Michaels	
Printed		2026-06-26
Plan Completion/Update Date	2023-06-09	
SnapPlus Version	20.4 built on 2021-06-03	
C:\Users\sara.wilhelm\OneDrive - Iowa County\Land Conservation - Documents\Technical assistance\P Trading\Phosphorus Trading-Wyoming\Patrick Michaels\NMPP\Patrick Michaels.snapDb		

Prepared for:
Patrick Michaels
attn:Patrick Michaels
6679 State Road 23
Spring Green, 53588

			Predominant				Samples			in ppm					
			Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
7		3.8	254C2	NORDEN	2022-11-30	22-332-0671		1	3	6.4	2.9	26	188	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2022	2023	2024	2025	2026	2027
7	2022-11-30						X

