# Permit Fact Sheet

## General Information

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|---|---|
| Permit Number | WI-0022217-11-0 |
| Permittee Name and Address | CITY OF CUBA CITY<br>108 N. Main Street, Cuba City, WI 53807 |
| Permitted Facility Name and Address | Cuba City Wastewater Treatment Facility<br>720 S. Splinter Street, Cuba City, WI 53807 |
| Permit Term | April 01, 2026 to March 31, 2031 |
| Discharge Location | A ditch tributary to Coon Branch, approx. 800 feet southeast of the WWTF. NE1/4, SW1/4 & NW1/4, SE1/4, Section 31, T2N, R1E |
| Receiving Water | Tributary to Coon Branch (Galena [Fever] River Watershed, GP01 – Grant-Platte River Basin) in Lafayette County |
| Stream Flow ($Q_{7,10}$) | At the location of Outfall 001: 0 cfs<br>Downstream of Outfall 001, SW1/4, SE1/4, Section 31, T2N, R1E: 0.12 cfs |
| Stream Classification | Limited Aquatic Life (LAL) at the point of discharge to the confluence with Coon Branch.<br>Limited forage fishery (LFF) from the confluence of the tributary downstream to Hwy 11 bridge.<br>Warm Water Sport Fishery (WWSF) downstream of Hwy 11 bridge. |
| Discharge Type | Existing, Continuous |
| Annual Average Design Flow (MGD) | 0.30 MGD |
| Industrial or Commercial Contributors | Weber Meat Processing Plant |
| Plant Classification | A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; L - Laboratory; SS - Sanitary Sewage Collection System |
| Approved Pretreatment Program? | N/A |

## Facility Description

The City of Cuba City operates a wastewater treatment facility consisting of preliminary screening, EQ pond, activated sludge (oxidation ditch), final clarification, chemical phosphorus removal, and post-aeration prior to discharge to a tributary to Coon Branch. Sludge from the treatment process is aerobically digested and stored on-site prior to land application on Department approved sites.

## Substantial Compliance Determination

**Enforcement During Last Permit:** There have been several violations of effluent limits, missed samples, late reporting, adaptive management implementation, and land application practices. The facility has completed most of the previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on November 18, 2025, this facility has been found to be in substantial compliance with their current permit.

# Sample Point Descriptions

| Sample Point Designation | | |
|---|---|---|
| **Sample Point Number** | **Discharge Flow, Units, and Averaging Period** | **Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)** |
| 701 | 0.20 MGD<br>(August 2019 – July 2025 Average) | Influent: 24-hr flow proportional composite samples shall be collected after screening. A Parshall flume is located in the screening building. |
| 001 | 0.15 MGD<br>(August 2019 – July 2025 Average) | Effluent: 24-hr flow proportional composite samples shall be collected at the stepped aeration, prior to discharge to the Coon Branch. A radar level sensor flow meter is located at the v-notch weir. |
| 003 | 20 Dry U.S. tons<br>(2025 Permit Application) | Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge storage tanks. |
| 601 | Inactive | Outfall removed from the permit. Sample point no longer applicable. |

# Permit Requirements

# 1 Influent – Monitoring Requirements

## 1.1 Sample Point Number: 701- INFLUENT

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

### Changes from Previous Permit:

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

**Flow:** The sample frequency has changed from “Continuous” to “Daily” for eDMR reporting purposes.

### Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

# 2 Surface Water - Monitoring and Limitations

## 2.1 Sample Point Number: 001- EFFLUENT

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Daily | Continuous | |
| BOD5, Total | Weekly Avg | 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 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 permit section. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 10 mg/L | 3/Week | 24-Hr Flow Prop Comp | April |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 4.7 mg/L | 3/Week | 24-Hr Flow Prop Comp | May - September |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 16 mg/L | 3/Week | 24-Hr Flow Prop Comp | October - March |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 4.5 mg/L | 3/Week | 24-Hr Flow Prop Comp | April |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 2.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | May - September |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 6.9 mg/L | 3/Week | 24-Hr Flow Prop Comp | October - March |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | Weekly | Grab | Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. |
| E. coli | % Exceedance | 10 Percent | Monthly | Calculated | Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month. |
| Chloride | | mg/L | 4/Month | 24-Hr Flow Prop Comp | Monitoring only. Sampling shall be done on four consecutive days one week per month. See Chloride - Implement Source Reduction Measures permit section and schedule. |
| 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 | 6-Month Avg | 0.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | Limit effective throughout the permit term, as it represents a minimum control level. |
| Phosphorus, Total | | lbs/day | 3/Week | Calculated | Report daily mass discharged using Equation 1a. in the Water Quality Trading (WQT) permit section. |
| WQT Credits Used | | lbs/month | Monthly | Calculated | Effective January 1, 2027. Report WQT TP Credits |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| (TP) | | | | | used per month using Equation 2c. in the Water Quality Trading (WQT) permit 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 | Effective January 1, 2027. Report the WQT TP Computed Compliance value using Equation 3a. in the Water Quality Trading (WQT) permit section. Value entered on the last day of the month. |
| WQT Computed Compliance (TP) | 6-Month Avg | 0.075 mg/L | Monthly | Calculated | Effective January 1, 2027. Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31. |
| WQT Credits Used (TP) | Annual Total | 299 lbs/yr | Annual | Calculated | Effective January 1, 2027. 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 permit section. |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. |
| Nitrogen, Total | | mg/L | See Listed Qtr(s) | Calculated | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Acute WET | | TUa | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See Whole Effluent Toxicity (WET) Testing permit section. |
| Chronic WET | | TUc | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See Whole Effluent Toxicity (WET) Testing permit section. |

## Changes from Previous Permit

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

**Flow:** Sample frequency changed from "Continuous" to "Daily" for eDMR reporting purposes.

**Dissolved Oxygen (DO) & pH:** Sample frequency changed from "3/Week" to "5/Week".

**Ammonia:** Daily maximum limit has changed from 15 mg/L to variable daily maximum limits.

**E. coli & Disinfection:** At the end of the compliance schedule, disinfection requirements and E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply. Monitoring is not required until the limit becomes effective at the end of the compliance schedule.

**Phosphorus:** The City of Cuba City was utilizing Adaptive Management during the prior permit term to address phosphorus Water Quality-Based Effluent Limitations (WQBELs). For this permit term, the City established a Water Quality Trade by stabilizing eroding streambanks, thereby generating 299 lbs/yr of phosphorus credit. Water Quality Trade reporting requirement and these credits are applied in this permit to demonstrate compliance with final phosphorus WQBELs. A phosphorus minimum control level (MCL) of 1.0 mg/L as a monthly average and 0.6 mg/L as a six-month average are included, equivalent to the interim TP limits from the previous permit term.

**Total Nitrogen Monitoring (TKN, NO2+NO3 and Total N):** Annual monitoring is required in specific quarters as outlined in the permit.

**Acute and Chronic WET:** Acute and chronic WET tests are required in specific quarters as outlined in the permit.

## Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo for the City of Cuba City Wastewater Treatment Facility dated November 12, 2025, and updated January 23, 2026, prepared by Zainah Masri, and used for this reissuance.

**Ammonia:** 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, as requested by the facility during the compliance inspection on November 18, 2025.

**E. coli & Disinfection:** Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020.

Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the department determines, in accordance with the procedures specified in s. NR

210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

It was determined that the permittee is required to disinfect, during the following months, May – September. See WQBEL for further explanation.

**Chlorine:** If the City of Cuba City Wastewater Treatment Facility decides to use chlorination for disinfection, effluent limitations would be recommended to ensure proper operation of the de-chlorination system and would become effective May 01, 2030 with the E. coli limitations. See the WQBEL for limits and more information.

**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 Coon Branch is 0.075 mg/L. In this case, the WQBEL is 0.225 mg/L (monthly average) & 0.075 mg/L (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. In accordance with s. NR 217.14, Wis. Adm. Code, a final mass limit for phosphorus is not required. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. A phosphorus minimum control level (MCL) of 1.0 mg/L as a monthly average and 0.6 mg/L as a six-month average are included, equivalent to the interim TP limits from the previous permit term.

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-2026-0003) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The City is implementing streambank stabilization. The WQT Plan proposes the generation of 299 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:** The department has included effluent monitoring for Total Nitrogen through the authority under s. 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

**Zinc:** The WQBEL memo recommended zinc monitoring and limits and a compliance schedule to meet zinc WQBELs in the permit. During the permit fact check period, the permittee submitted additional zinc data. The P99's were calculated using the 11 sample results submitted by the facility. The 1-day P99 is 134 ug/L and the 4-day P99 is 75 ug/L. The calculated daily maximum and weekly average effluent limits are 345 ug/L, therefore zinc monitoring and limits are not required.

**Temperature:** The WQBEL memo recommended one year of temperature monitoring be included in the permit to have more recent data available at the next permit reissuance. Based on comments received during the fact check period, the department reevaluated the need for temperature monitoring. The available temperature data is representative of the current discharge and below the calculated limits, therefore temperature monitoring is not included in the permit.

**PFOS and PFOA:** NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), 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, the department has determined the permittee does not need to sample for PFOS or PFOA in the effluent as part of this permit reissuance. 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.

**Monitoring Frequencies:** The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The sample frequency for pH and DO was increased from 3/Week to 5/Week to align the City of Cuba City with facilities of similar size and type and to better capture effluent quality of these operational parameters. Dissolved Oxygen and pH samples must be tested onsite within 15 minutes of sample collection.

Requirements in administrative code (NR 108, 205, 210, and 214 Wis. Adm. Code) and Sections 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The department has determined at this time that the aforementioned changes in monitoring frequency are warranted based on the size and type of the facility.

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

## Sample Point Number: 601 – In-Stream Sampling Point 601

### Changes from Previous Permit

Downstream surface water monitoring is no longer required. Monitoring was included as part of the Adaptive Management requirements. The permittee is no longer utilizing Adaptive Management as a compliance option to meet phosphorus limits.

# 3 Land Application - Monitoring and Limitations

| Municipal Sludge Description | | | | | | |
|---|---|---|---|---|---|---|
| **Sample Point** | **Sludge Class (A or B)** | **Sludge Type (Liquid or Cake)** | **Pathogen Reduction Method** | **Vector Attraction Method** | **Reuse Option** | **Amount Reused/Disposed (Dry Tons/Year)** |
| 003 | B | Liquid | Fecal Coliform | Aerobic SOUR Test | Land Application | 20 |
| 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**<br>If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility | | | | | | |

| 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)** |
| Is a priority pollutant scan required? **No, design flow is less than 5 MGD.**<br>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. | | | | | | |

## Sample Point Number: 003- SLUDGE

| Monitoring Requirements and Limitations | | | | | |
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| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Solids, Total | | Percent | Annual | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Annual | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Annual | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Annual | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Annual | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Annual | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Annual | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Annual | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Annual | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Annual | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Annual | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Annual | Composite | |
| Nitrogen, Ammonium (NH4-N) Total | | Percent | Annual | Composite | |
| Phosphorus, Total | | Percent | Annual | Composite | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Phosphorus, Water Extractable | | % of Tot P | Annual | Composite | |
| Potassium, Total Recoverable | | Percent | Annual | Composite | |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Once in 2027. |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Once in 2027. |
| PFOA + PFOS | | ug/kg | Annual | Calculated | Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information. |
| PFAS Dry Wt | | | Annual | Grab | Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information. |

## Changes from Previous Permit:

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

The parameter order has changed, PCB is listed after the List 2 – Nutrients.

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

## Explanation of Limits and Monitoring Requirements

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

**PFAS:** The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA 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 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance.

| Required Action | Due Date |
|---|---|
| **Progress Report:** The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits. | 12/31/2026 |
| **Submit Facility Plan:** The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor. | 06/30/2027 |
| **Final Plans and Specifications:** The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below. | 06/30/2028 |
| **Treatment Plant Upgrade to Meet Limitations:** The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. | 12/31/2028 |
| **Construction Upgrade Progress Report:** The permittee shall submit a progress report on construction upgrades. | 09/30/2029 |
| **Complete Construction:** The permittee shall complete construction of wastewater treatment system upgrades. | 03/31/2030 |
| **Achieve Compliance:** The permittee shall achieve compliance with final E. coli limitations. | 04/30/2030 |

### Explanation of Schedule

A compliance schedule is included in the permit to provide time for the permittee to submit plans and specs and install disinfection treatment for meeting effluent E. coli water quality-based effluent limits and disinfection requirements pursuant to s. NR 210.06, Wis. Adm. Code. If the facility chooses to utilize chlorine for disinfection purposes, the permit may be modified to include total residual chlorine limits as suggested by the document, Water Quality-Based Effluent limits (WQBEL) memo for the City of Cuba City Wastewater Treatment Facility dated November 12, 2025.

## 4.2 Chloride Source Reduction Measures Summary

| Required Action | Due Date |
|---|---|
| **Annual Chloride Progress Report:** Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall:<br><br>Indicate which chloride source reduction measures or activities have been implemented and state which, if any, source reduction measures were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year; | 01/31/2027 |

| | |
|---|---|
| Include an analysis of trends in weekly, monthly and annual average chloride concentrations based on chloride sampling and flow data; and<br>Include an analysis of how effluent chloride varies with time and with significant loadings of chloride.<br>The first annual chloride progress report is to be submitted by the Date Due. | |
| **Annual Chloride Progress Report #2:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2028 |
| **Annual Chloride Progress Report #3:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2029 |
| **Annual Chloride Progress Report #4:** Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above. | 01/31/2030 |
| **Final Chloride Report:** Submit the final chloride report documenting the source reduction activities for the current permit term and the success in maintaining chloride effluent concentrations.<br>The report shall:<br>Summarize chloride source reduction measures that have been implemented during the current permit term;<br>Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly;<br>Include an analysis of trends in weekly, monthly and annual average chloride concentrations based on chloride sampling and flow data during the current permit term; and<br>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride. | 09/30/2030 |
| **Annual Chloride Reports After Permit Expiration:** In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above. | |

## Explanation of Schedule

The schedule requires annual reports shall indicate which source reduction measures have been implemented during each calendar year, and an analysis of chloride concentration trends based on chloride sampling and flow data.

## 4.3 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:<br>The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance;<br>The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source;<br>A summary of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and | 01/31/2027 |

| | |
|---|---|
| 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. | |
| **Annual WQT Report #2:** Submit an annual WQT report that shall cover the previous year. | 01/31/2028 |
| **Annual WQT Report #3:** Submit an annual WQT report that shall cover the previous year. | 01/31/2029 |
| **Annual WQT Report #4:** Submit an annual WQT report. If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time. | 01/31/2030 |
| **Annual WQT Report #5:** Submit an annual WQT report that shall cover the previous year. | 01/31/2031 |
| **Annual WQT Report Required After Permit Expiration:** In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year. | |

### Explanation of Schedule

The Annual WQT Report due January 1, 2027 should verify that the WQT Plan is implemented as approved and practices are installed, the report should include signed WQT Management Practice Registration form(s). 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

## 4.4 Land Application Management Plan

A management plan is required for the land application system.

| Required Action | Due Date |
|---|---|
| **Land Application Management Plan Submittal:** Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. | 12/31/2026 |

### Explanation of Schedule

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

## Attachments

Water Quality Based Effluent Limits dated November 12, 2025, updated January 23, 2026

Water Quality Trading Plan Approval Letter dated February 09, 2026

Water Quality Trading Plan dated February 2026

## Justification Of Any Waivers From Permit Application Requirements

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

**Prepared By:** BetsyJo Howe, Wastewater Specialist **Date:** 02/13/2026

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 12, 2025 (updated 01/23/2026 variable ammonia limits table)

TO: Betsyjo Howe – Fitchburg/SCR

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the City of Cuba City Wastewater Treatment Facility WPDES Permit No. WI-0022217-11-0

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 City of Cuba City Wastewater Treatment Facility in Lafayette County. This municipal wastewater treatment facility (WWTF) discharges to the Tributary to Coon Branch located in the Galena (Fever) River Watershed in the GP01 Grant-Platte River Basin.
The evaluation of the permit recommendations is discussed in more detail in the attached report.

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

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Six-Month Average | Footnotes |
|---|---|---|---|---|---|---|
| Flow Rate | | | | | | 1,2 |
| $BOD_5$ | | | 30 mg/L | 20 mg/L | | 1 |
| TSS | | | 30 mg/L | 20 mg/L | | 1 |
| pH | 9.0 s.u. | 6.0 s.u. | | | | 1 |
| Dissolved Oxygen | | 4.0 mg/L | | | | 1 |
| Ammonia Nitrogen<br>April<br>May – September<br>October– March | <br>1.6 mg/L<br>1.6 mg/L<br>1.6 mg/L | | <br>10 mg/L<br>4.7 mg/L<br>16 mg/L | <br>4.5 mg/L<br>2.0 mg/L<br>6.9 mg/L | | 3 |
| Bacteria | | | | | | |
| Final Limit<br>*E. coli* | | | | 126 #/100 mL geometric mean | | 4 |
| Chloride | | | | | | 5 |
| Residual Chlorine | 19 µg/L | | 7.3 µg/L | **7.3 µg/L** | | 6 |
| Zinc | 345 µg/L | | 345 µg/L | **345 µg/L** | | 7,8 |
| Phosphorus | | | | | | |
| WQT MCL | | | | 1.0 mg/L | 0.6 mg/L | 9 |
| Final WQBELs | | | | 0.225 mg/L | 0.075 mg/L | |
| Temperature | | | | | | 10 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | | 1,11 |
| Acute WET | | | | | | 12,14,15 |
| Chronic WET | | | | | | 13,14,15 |

Footnotes:

1. No changes from the current permit.

2. Monitoring only.
3. 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. The Cuba City Wastewater Treatment Facility shall notify the Department if the single limit or the variable limits based on effluent pH are preferred. These limits apply year-round. If the single limit is included in the permit the weekly and monthly average limits should be 1.6 mg/L due to expression of limits.

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|---|---|
| $6.0 \leq pH \leq 6.1$ | 65.4 | $7.0 < pH \leq 7.1$ | 39.6 | $8.0 < pH \leq 8.1$ | 8.4 |
| $6.1 < pH \leq 6.2$ | 64.2 | $7.1 < pH \leq 7.2$ | 35.6 | $8.1 < pH \leq 8.2$ | 6.9 |
| $6.2 < pH \leq 6.3$ | 62.7 | $7.2 < pH \leq 7.3$ | 31.6 | $8.2 < pH \leq 8.3$ | 5.7 |
| $6.3 < pH \leq 6.4$ | 61.0 | $7.3 < pH \leq 7.4$ | 27.7 | $8.3 < pH \leq 8.4$ | 4.7 |
| $6.4 < pH \leq 6.5$ | 59.0 | $7.4 < pH \leq 7.5$ | 24.0 | $8.4 < pH \leq 8.5$ | 3.9 |
| $6.5 < pH \leq 6.6$ | 56.5 | $7.5 < pH \leq 7.6$ | 20.5 | $8.5 < pH \leq 8.6$ | 3.2 |
| $6.6 < pH \leq 6.7$ | 53.8 | $7.6 < pH \leq 7.7$ | 17.4 | $8.6 < pH \leq 8.7$ | 2.7 |
| $6.7 < pH \leq 6.8$ | 50.7 | $7.7 < pH \leq 7.8$ | 14.6 | $8.7 < pH \leq 8.8$ | 2.2 |
| $6.8 < pH \leq 6.9$ | 47.2 | $7.8 < pH \leq 7.9$ | 12.2 | $8.8 < pH \leq 8.9$ | 1.9 |
| $6.9 < pH \leq 7.0$ | 43.6 | $7.9 < pH \leq 8.0$ | 10.1 | $8.9 < pH \leq 9.0$ | 1.6 |

4. 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.
5. Monitoring is recommended to continue in the next permit term.
6. **If the Cuba City Wastewater Treatment Facility decides to upgrade to use chlorination for disinfection, effluent limitations would be recommended to assure proper operation of the de-chlorination system.**
7. The zinc limit is based on reasonable potential comparing a single effluent result to $1/5^{th}$ of the calculated effluent limit. The limit would not be required if additional data is submitted resulting in a mean of less than $1/5^{th}$ of the limit; or with eleven detects if the $P_{99}$ is less than the calculated limits (1-day $P_{99}$ for the daily and 4-day $P_{99}$ for the weekly average limit).
8. 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.
9. **Phosphorus WQBELs are met through water quality trade (WQT), which requires a corresponding minimum control level (MCL) to be met at the discharge.**
10. It is recommended that the Cuba City Wastewater Treatment Facility conduct one year of temperature monitoring during the permit term, in order to have more recent data available.
11. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate ($NO_3$), nitrite ($NO_2$), and total Kjeldahl nitrogen (TKN) (all expressed as N).
12. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022), **1 acute WET test per year is recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.
13. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and, **1 chronic WET test per year are recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. The Instream Waste Concentration (IWC) to assess chronic test results is 65%. According to the *State*

*of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a synthetic (standard) lab water, due to little flow upstream of outfall 001.

14. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Testing should continue after the permit expiration date (until the permit is reissued).
15. If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then both acute and chronic WET testing can be reduced to 3 tests during the permit term.

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, Ammonia Nitrogen Calculations and Map

PREPARED BY: Zainah Masri, Water Resources Engineer Zainah Masri

APPROVED BY: Diane Figiel Date: 01/23/2026
Diane Figiel, PE,
Water Resources Engineer

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

Attachment #1

**Water Quality-Based Effluent Limitations for**
**Cuba City Wastewater Treatment Facility**

**WPDES Permit No. WI-0022217-11-0**

Prepared by: Zainah Masri – WY/3

## PART 1 – BACKGROUND INFORMATION

**Facility Description**
The City of Cuba City operates a 0.30 MGD wastewater treatment facility consisting of preliminary treatment (screening), EQ pond, activated sludge (oxidation ditch), final clarification, chemical phosphorus removal, and post-aeration. Sludge from the treatment process is aerobically digested and stored prior to landspreading seasonally on DNR approved fields.

Attachment #3 is a map of the area showing the approximate location of Outfall 001.

**Existing Permit Limitations**
The current permit, which expired on September 30, 2025, includes the following effluent limitations and monitoring requirements.

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Six-Month Average | Footnotes |
|---|---|---|---|---|---|---|
| Flow Rate | | | | | | 1,2 |
| $BOD_5$ | | | 30 mg/L | 20 mg/L | | 1,3 |
| TSS | | | 30 mg/L | 20 mg/L | | 1,3 |
| pH | 9.0 s.u. | 6.0 s.u. | | | | 1 |
| Dissolved Oxygen | | 4.0 mg/L | | | | 1,3 |
| Ammonia Nitrogen<br>April<br>May – September<br>October– March | <br>15 mg/L<br>15 mg/L<br>15 mg/L | | <br>10 mg/L<br>4.7 mg/L<br>16 mg/L | <br>4.5 mg/L<br>2.0 mg/L<br>6.9 mg/L | | - |
| Chloride<br>Interim Limit<br>Final Limit | | | | <br>450 mg/L<br>400 mg/L | | 4 |
| Phosphorus<br>AM Interim Limits<br>Final | | | | <br>1.0 mg/L<br>0.225 mg/L | <br>0.6 mg/L<br>0.075 mg/L | 5 |
| TKN,<br>Nitrate+Nitrite, and<br>Total Nitrogen | | | | | | 6 |
| Chronic WET | | | | | | 7 |

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. Monitoring only
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. Interim limit to the chloride WQBEL granted in accordance with s. NR 106.83(2), Wis. Adm. Code, as part of the chloride variance.
5. Interim limits to the phosphorus WQBELs granted in accordance with s. NR 217.18(3)(e)2., Wis. Adm. Code, as part of adaptive management (AM).
6. 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).
7. The IWC for chronic WET was 65%.

**Receiving Water Information**

- Name: Tributary to Coon Branch
- Waterbody Identification Code (WBIC): 5041382
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code
  - Tributary to Coon Branch: Limited aquatic life (LAL) to its confluence with Coon Branch.
  - Coon Branch: Limited forage fishery (LFF) from the confluence of the tributary downstream to the Wisconsin Highway 11 bridge (approximately 0.07 mile downstream of the outfall).
  - Coon Branch: Warm water sport fishery (WWSF) downstream of the Highway 11 Bridge (approximately 2.9 miles downstream of the outfall). This location is based on a 2003 proposed stream classification revision, current code references the confluence with the Galena River as the point of classification change. This does not change the final limit recommendations due to the antidegradation requirements in ch. NR 207.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-$Q_{10}$ and 7-$Q_2$ values are where Outfall 001 is located.

  Tributary to Coon Branch:

  7-$Q_{10}$ = 0 cfs

  7-$Q_2$ = 0 cfs

  Downstream of the outfall, low flow information was estimated by the U.S. Geological Survey at the SW ¼ of SE ¼ of Section 31 (T2N_R1E) in Lafayette County at the bridge on town road approximately 1.4 miles southeast of Cuba City.

  7-$Q_{10}$ = 0.12 cubic feet per second (cfs)

  7-$Q_2$ = 0.18 cfs

  And 2.9 miles downstream of the outfall at NE ¼ of Section 8 (T1N-R1E) State Highway 11, the low flow estimated by department on May 24, 1995 was used in the calculation of ammonia limitations where the stream is classified as a warm water sport fish community.

  7-$Q_{10}$ = 0.25 cfs

  7-$Q_2$ = 0.375 cfs
- Hardness = 425 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit

application from the December 2024 to January 2025. Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.

- % 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. 100% mixing with downstream flow is assumed in calculating limits for downstream protection.

- 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: Coon Branch and the Galena River are both listed on the Wisconsin 303d List for Impaired Waters for degraded biological community due to unknown pollutants.

**Effluent Information**

- Design flow rate(s):
  Annual average = 0.3 million gallons per day (MGD)

  For reference, the actual average flow from August 2019 to July 2025 was 0.15 MGD.

- Hardness = 425 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in December 2024 and January 2025 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with one industrial contributor
  - Weber's Processing Plant (meat processing plant)
- Water supply: Municipality waterworks and private wells.
- Additives: Cuba City Wastewater Treatment Facility has included one additive in the permit application that has the potential to be present in Outfall 001. This additive is listed below:
  - Aluminum sulfate – phosphorus removal
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additive. The facility is also 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.

Attachment #1

**Copper Effluent Data**

| Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) |
|---|---|---|---|---|---|
| 12/09/2024 | 12 | 12/21/2024 | 19 | 01/02/2025 | 23 |
| 12/12/2024 | 29 | 12/24/2024 | 12 | 01/05/2025 | 18 |
| 12/15/2024 | 11 | 12/27/2024 | 10 | 01/08/2025 | 17 |
| 12/18/2024 | 19 | 12/30/2024 | 11 | | |
| 1-day $P_{99}$ = 35 µg/L | | | | | |
| 4-day $P_{99}$ = 25 µg/L | | | | | |

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

**Chloride Effluent Data**

| | Chloride (mg/L) |
|---|---|
| 1-day $P_{99}$ | 447 |
| 4-day $P_{99}$ | 357 |
| 30-day $P_{99}$ | 307 |
| Mean | 281 |
| Std | 59 |
| Sample size | 248 |
| Range | 127 - 420 |

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

**Parameters with Effluent Limits**

| | Average Measurement | Average Mass Discharged |
|---|---|---|
| $BOD_5$ | 3.0 mg/L* | - |
| TSS | 8.0 mg/L | - |
| pH field | 8.5 s.u. | - |
| Dissolved Oxygen | 4.6 mg/L | - |
| Ammonia Nitrogen | 0.17 mg/L* | - |
| Chloride | 248 mg/L | - |
| Phosphorus | 0.53 mg/L | 0.70 lbs/day |

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

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

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

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)

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

**Acute Limits based on 1-$Q_{10}$**

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

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-$Q_{10}$ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for the Cuba City Wastewater Treatment Facility.

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-$Q_{10}$ (estimated as 80% of 7-$Q_{10}$)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

| SUBSTANCE | REF. HARD.* mg/L | ATC | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|
| Chlorine | | 19 | 19 | 3.8 | | | |
| Arsenic | | 340 | 340 | 68 | <1.1 | | |
| Cadmium | 425 | 152 | 152 | 30 | 0.24 | | |
| Chromium | 301 | 4,446 | 4,446 | 889 | <3.3 | | |
| Copper | 425 | 61 | 61 | | | 35 | 29 |
| Lead | 356 | 365 | 365 | 73 | <5.4 | | |

Attachment #1

| 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. |
|---|---|---|---|---|---|---|---|
| Nickel | 268 | 1,080 | 1,080 | 216 | <4.7 | | |
| Zinc | 333 | 345 | 345 | **69** | **110** | | |
| Chloride (mg/L) | | 757 | 757 | | | 447 | 420 |

* 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-$Q_{10}$ 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-$Q_{10}$), 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 | 1.5 | | |
| Arsenic | | 152 | 152 | 30 | <1.1 | |
| Cadmium | 175 | 3.8 | 3.8 | 0.8 | 0.24 | |
| Chromium | 301 | 326 | 326 | 65 | <3.3 | |
| Copper | 425 | 69 | 69 | | | 25 |
| Lead | 356 | 96 | 96 | 19 | <5.4 | |
| Nickel | 268 | 169 | 169 | 34 | <4.7 | |
| Zinc | 333 | 345 | 345 | **69** | **110** | |
| Chloride (mg/L) | | 395 | 395 | | | 357 |

* 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 (¼ 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 | 0.24 |
| Chromium (+3) | 16,800 | 16,800 | 3,360 | <3.3 |
| Lead | 16,800 | 16,800 | 3,360 | <5.4 |
| Nickel | 110,000 | 110,000 | 22,000 | <4.7 |

**Monthly Average Limits based on Human Cancer Criteria (HCC)**
RECEIVING WATER FLOW = 0 cfs (¼ 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 | 40 | 40 | 8 | <1.1 |

**Conclusions and Recommendations**
Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are required for zinc, and chloride monitoring is recommended in the next permit term.** Limits and/or monitoring recommendations are made in the paragraphs below:

Copper – Considering available effluent data from the current permit application taken from December 2024 to January 2025 the 1-day $P_{99}$ concentration is 35 µg/L, with a maximum concentration of 29 µg/L. The maximum effluent concentration and the 1-day $P_{99}$ of the effluent data do not exceed the calculated daily maximum limit, **therefore concentration and mass limits, as well as monthly monitoring, are not required.**

Zinc – Considering the available effluent data point from the current permit application taken on December 19, 2024, which was 110 µg/L, **a daily and weekly limit of 345 µg/L would be required**.

The zinc limit is based on reasonable potential comparing a single effluent result to 1/5$^{th}$ of the calculated effluent limit. The limit would not be required if additional data is submitted resulting in a mean of less than 1/5$^{th}$ of the limit; or with eleven detects if the $P_{99}$ is less than the calculated limits (1-day $P_{99}$ for the daily and 4-day $P_{99}$ for the weekly average limit). This recommendation may change if additional sample data is collected.

Chloride – Considering available effluent data from the current permit term July 2020 to August 2025, the 1-day $P_{99}$ chloride concentration is 447 mg/L, and the 4-day $P_{99}$ of effluent data is 357 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, **therefore effluent limits are not required to continue, but monitoring is recommended to continue in the next permit term.**

Mercury – The permit application did not require monitoring for mercury because the Cuba City Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from August 2020 to October 2024 was 2.5 mg/kg, with a maximum reported concentration of 8.4 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.

Based on the type of discharge, the effluent flow rate, and 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.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

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

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
A = 0.411 and B = 58.4 for a Limited Forage Fishery, and
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 1,884 sample results were reported from July 2020 to August 2025. The maximum reported value was 9.0 s.u. (Standard pH Units). The effluent pH was 9.0 s.u. or less 99% of the time. The 1-day $P_{99}$, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 9.6 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 9.5 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 = 2.65 mg/L.

**Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method**

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

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

Attachment #1

**Daily Maximum Ammonia Nitrogen Determination**

| | | Ammonia Nitrogen Limit mg/L |
|---|---|---|
| LAL (tributary to Coon Branch) | 2×ATC | 4.1 |
| | 1-$Q_{10}$ | 2.0 |
| LFF (Coon Branch – from tributary to Wisconsin Hwy 11 bridge | 2×ATC | 2.7 |
| | 1-$Q_{10}$ | 1.6 |
| WWSF (Coon Branch) | 2×ATC | 2.7 |
| | 1-$Q_{10}$ | 1.9 |

The 1-$Q_{10}$ method of LFF yields the most stringent limits for the Cuba City Wastewater Treatment Facility.

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

**Daily Maximum Ammonia Nitrogen Limits – LFF using 1Q10 of 0.1 cfs**

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|---|---|
| $6.0 \leq pH \leq 6.1$ | 65.4 | $7.0 < pH \leq 7.1$ | 39.6 | $8.0 < pH \leq 8.1$ | 8.4 |
| $6.1 < pH \leq 6.2$ | 64.2 | $7.1 < pH \leq 7.2$ | 35.6 | $8.1 < pH \leq 8.2$ | 6.9 |
| $6.2 < pH \leq 6.3$ | 62.7 | $7.2 < pH \leq 7.3$ | 31.6 | $8.2 < pH \leq 8.3$ | 5.7 |
| $6.3 < pH \leq 6.4$ | 61.0 | $7.3 < pH \leq 7.4$ | 27.7 | $8.3 < pH \leq 8.4$ | 4.7 |
| $6.4 < pH \leq 6.5$ | 59.0 | $7.4 < pH \leq 7.5$ | 24.0 | $8.4 < pH \leq 8.5$ | 3.9 |
| $6.5 < pH \leq 6.6$ | 56.5 | $7.5 < pH \leq 7.6$ | 20.5 | $8.5 < pH \leq 8.6$ | 3.2 |
| $6.6 < pH \leq 6.7$ | 53.8 | $7.6 < pH \leq 7.7$ | 17.4 | $8.6 < pH \leq 8.7$ | 2.7 |
| $6.7 < pH \leq 6.8$ | 50.7 | $7.7 < pH \leq 7.8$ | 14.6 | $8.7 < pH \leq 8.8$ | 2.2 |
| $6.8 < pH \leq 6.9$ | 47.2 | $7.8 < pH \leq 7.9$ | 12.2 | $8.8 < pH \leq 8.9$ | 1.9 |
| $6.9 < pH \leq 7.0$ | 43.6 | $7.9 < pH \leq 8.0$ | 10.1 | $8.9 < pH \leq 9.0$ | 1.6 |

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

Weekly and monthly average limits are included in the current permit but are being evaluated here due to changes to ch. NR 106, Wis. Adm. Code. **The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates, however the daily maximum limit has decreased due to the change in pH. 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 July 2020 to August 2025.

Attachment #1

**Ammonia Nitrogen Effluent Data**

| | Ammonia Nitrogen mg/L |
|---|---|
| 1-day $P_{99}$ | 2.4 |
| 4-day $P_{99}$ | 1.6 |
| 30-day $P_{99}$ | 0.71 |
| Mean* | 0.17 |
| Std | 0.95 |
| Sample size | 1173 |
| Range | <0.05 - 12 |

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

**Ammonia Nitrogen Effluent Data**

| Ammonia Nitrogen mg/L | May – September | October – March | April |
|---|---|---|---|
| 1-day $P_{99}$ | 4.2 | 3.8 | 12 |
| 4-day $P_{99}$ | 2.8 | 2.3 | 6.9 |
| 30-day $P_{99}$ | 1.2 | 0.96 | 3.0 |
| Mean* | 0.37 | 0.39 | 1.4 |
| Std | 1.2 | 0.95 | 2.8 |
| Sample size | 120 | 210 | 33 |
| Range | <0.05 - 12 | <0.05 - 12 | <0.05 - 10 |

*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 average 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 – September | 1.6 mg/L or Variable | 10 mg/L | 4.5 mg/L |
| October – March | 1.6 mg/L or Variable | 4.7 mg/L | 2.0 mg/L |
| April | 1.6 mg/L or Variable | 16 mg/L | 6.9 mg/L |

## PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet E. coli limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

The Cuba City Wastewater Treatment Facility had previously been exempted from disinfection based on the limited aquatic life or limited forage fish community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (**not** on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the Tributary to Coon Branch is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Therefore, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. 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.

**These limits are required during May through September.** The permit will include a compliance schedule to meet these limits.

Total Residual Chlorine – **If the Cuba City Wastewater Treatment Facility decides to upgrade to use chlorination for disinfection, effluent limitations would be 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 would be required if the Cuba City Wastewater Treatment Facility decides to use chlorination for disinfection.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The calculated **weekly average effluent limitation of 7.3 µg/L would also be included in the permit because it is more restrictive than the daily maximum limit.**

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a monthly average limit of 7.3 µg/L would also be required to meet expression of limits** requirements in addition to the daily max and weekly average limits.

## 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 the Cuba City Wastewater Treatment Facility has phosphorus limits in effect that are at and more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.**

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

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

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 the Cuba City Wastewater Treatment Facility is classified as limited aquatic life downstream from the point of discharge downstream to Coon Branch at Wisconsin Highway 11 bridge. The Coon Branch at that point is classified for warm water sport fishery.

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

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 Coon Branch
Qs = 100% of the 7-$Q_2$ of 0.18 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.3 MGD = 0.464 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 0.108 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.

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in the Galena River at Beebe Rd (#333230) and Sinsinawa River at Louisburg Rd (#223323) is 0.108 mg/L, just upstream from the point of discharge to the Coon Branch.

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 | 333230 | 223323 |
|---|---|---|
| Station Name | Monitoring station at Galena River at Beebe Road | Monitoring station at Sinsinawa River – Louisburg Rd |
| Waterbody | Galena River | Sinsinawa River |
| Sample Count | 6 | 13 |
| First Sample | 10/16/2006 | 10/22/2007 |
| Last Sample | 09/18/2007 | 10/19/2015 |
| Mean | 0.097 mg/L | 0.128 mg/L |
| Median | 0.079 mg/L | 0.108 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 July 2020 to August 2025.

Attachment #1

**Total Phosphorus Effluent Data**

| | Phosphorus mg/L |
|---|---|
| 1-day $P_{99}$ | 2.6 |
| 4-day $P_{99}$ | 1.4 |
| 30-day $P_{99}$ | 0.80 |
| Mean | 0.53 |
| Std | 0.54 |
| Sample size | 767 |
| Range | 0.05 - 5.43 |

**Reasonable Potential Determination**
The calculated WQBEL of 0.075 mg/L is less than the current technology-based limit of 1.0 mg/L, so the WQBEL must be included in the permit per s. NR 217.15(2), Wis. Adm. Code.

In accordance with s. NR 217.15(1), Wis. Adm. Code, there is reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria. The data suggest that a compliance schedule will be necessary for the facility to meet the given phosphorus limits.

**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.

**Water Quality Trading Minimum Control Level**
A WQT plan has been submitted as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the phosphorus WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but a MCL must be set as a limit not to be exceeded at the outfall location. **Therefore, the phosphorus limit of 1.0 mg/L as a monthly average and 0.6 mg/L as a six-month 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 86 °F.

**Reasonable Potential**
Currently, the most recent available data is from January 2018 to December 2018, which was 7 years ago; therefore, it is **recommended that the Cuba City Wastewater Treatment Facility conduct temperature monitoring for one year of the permit term, in order to have more recent data available.**

## PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

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

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid $IC_{25}$ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 65%,** shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

$Q_e$ = annual average flow = 0.3 MGD = 0.465 cfs
f = fraction of the $Q_e$ withdrawn from the receiving water = 0
$Q_s$ = 100% of the 7-$Q_{10}$ = 0.25 cfs
The IWC is calculated for protection of the first downstream full fish and aquatic life water, using 100% mixing because this point is approximately 2.9 miles downstream from the outfall.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit. In the case of the Cuba City Wastewater Treatment Facility, due to the little flow upstream of outfall 001, a synthetic (standard) laboratory water will be used for both acute and chronic WET tests.

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

**WET Data History**

| Date Test Initiated | Acute Results $LC_{50}$ % | | | | Chronic Results $IC_{25}$ % | | | | Footnotes or Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *C. dubia* | Fathead minnow | Pass or Fail? | Used in RP? | *C. dubia* | Fathead Minnow | Pass or Fail? | Use in RP? | |
| 06/02/1998 | - | >100 | Pass | No | - | >100 | Pass | No | 1 |
| 10/16/2007 | >100 | >100 | Pass | No | >100 | >100 | Pass | Yes | - |
| 07/24/2008 | >100 | >100 | Pass | No | >100 | >100 | Pass | No | 2 |
| 09/15/2015 | - | - | - | - | >100 | >100 | Pass | Yes | - |
| 10/24/2017 | - | - | - | - | >100 | >100 | Pass | Yes | - |
| 01/22/2019 | - | - | - | - | >100 | >100 | Pass | Yes | - |
| 09/24/2024 | - | - | - | - | >100 | >100 | Pass | Yes | - |

Footnotes:

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

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

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

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

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

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.<br><br>**0 Points** | IWC = 65 %.<br><br>**10 Points** |
| **Historical Data** | No tests used to calculate RP.<br>No new data available from the last 5 years.<br><br>**5 Points** | 5 tests used to calculate RP.<br>No tests failed.<br><br>**0 Points** |
| **Effluent Variability** | Little variability, no violations or upsets, consistent WWTF operations.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Receiving Water Classification** | < 4 mi to non-variance<br><br>**5 Points** | Same as Acute.<br><br>**5 Points** |
| **Chemical-Specific Data** | Reasonable potential for limits for Zinc and Ammonia nitrogen based on ATC;<br>Ammonia nitrogen limit carried over from the current permit.<br>Copper, Chloride and Cadmium detected.<br><br>**9 Points** | Reasonable potential for limits for Ammonia Nitrogen, and Zinc based on CTC;<br>Ammonia nitrogen limit carried over from the current permit.<br>Copper, Chloride and Cadmium detected.<br><br>**9 Points** |
| **Additives** | 0 Biocides and 1 Water Quality Conditioners added.<br><br>Permittee does not have proper P chemical SOPs in place<br><br>**16 Points** | All additives used more than once per 4 days.<br><br>**16 Points** |
| **Discharge Category** | 1 Industrial Contributor.<br><br>Weber's Processing Plant<br>**5 Points** | Same as Acute.<br><br>**0 Points** |
| **Wastewater Treatment** | Secondary or Better<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |
| **Downstream Impacts** | No impacts known.<br><br>**0 Points** | Same as Acute.<br><br>**0 Points** |

Attachment #1

| | Acute | Chronic |
|---|---|---|
| **Total Checklist Points:** | **40 Points** | **40 Points** |
| **Recommended Monitoring Frequency (from Checklist):** | 1x yearly | 1x yearly |
| **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**, 1 acute WET test per year and 1 chronic WET test per year are recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).

- If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then both acute and chronic WET testing can be reduced to 3 tests during the permit term.

Attachment #2

**Ammonia Nitrogen Calculations from WQBEL dated April 8, 2013**

| AMMONIA (as N) LIMITS | Cuba City | | 2013 |
|---|---|---|---|
| **CLASSIFICATION** | **LIMITED AQUATIC LIFE** | | |
| EFFLUENT FLOW (MGD) | 0.3 | | |
| EFFLUENT FLOW (cfs) | 0.464 | | |
| MAX. EFFLUENT pH (s.u.) | 7.66 | | |
| **BACKGROUND INFORMATION** | ***May – Oct.*** | ***Nov. – April*** | ***Spring*** |
| 7-$Q_{10}$ (cfs) | 0 | 0 | 0 |
| 7-$Q_2$ (cfs) | 0 | 0 | 0 |
| Ammonia (mg/L) | 0.06 | 0.48 | 0.11 |
| Temperature (deg C) | 23 | 3 | 9 |
| pH (std. units) | 7.66 | 7.66 | 7.66 |
| % of river flow used | 100 | 100 | 100 |
| Reference weekly flow | 0 | 0 | 0 |
| Reference monthly flow | 0 | 0 | 0 |
| **CRITERIA (in mg/L)** | | | |
| 4-day Chronic (@ backgrd. pH) | 35.33 | 128.28 | 87.13 |
| 30-day Chronic (@ backgrd. pH) | 14.13 | 51.31 | 34.85 |
| **EFFLUENT LIMITS (in mg/L)** | | | |
| Weekly average | 35.33 | 128.28 | 87.13 |
| Monthly average | 14.13 | 51.31 | 34.85 |

*Effluent pH of 7.66 s.u. was used for the stream background pH because it is an effluent dominated stream and the stream flow is zero.

Early life stages present limits do not apply for LAL streams because burbot are not expected to be present in the receiving water.

Early life stages present limits do not apply for LAL streams because burbot are not expected to be present in the receiving water.

Limits are also calculated based on downstream uses for the limited forage fish classification:

| **AMMONIA (as N) LIMITS** | | 2013 | |
|---|---|---|---|
| **CLASSIFICATION** | **LIMITED FORAGE FISH** | | |
| EFFLUENT FLOW (MGD) | 0.3 | | |
| EFFLUENT FLOW (cfs) | 0.464 | | |
| MAX. EFFLUENT pH (s.u.) | 7.66 | | |
| **BACKGROUND INFORMATION** | ***May – Sept.*** | ***Oct. – March*** | ***April*** |
| 7-$Q_{10}$ (cfs) | 0.12 | 0.12 | 0.12 |
| 7-$Q_2$ (cfs) | 0.18 | 0.18 | 0.18 |
| Ammonia (mg/L) | 0.06 | 0.48 | 0.11 |
| Temperature (deg C) | 23 | 3 | 9 |
| pH (std. units) | 8.21 | 7.97 | 7.97 |
| % of river flow used | 100 | 100 | 100 |
| Reference weekly flow | 0.12 | 0.12 | 0.12 |
| Reference monthly flow | 0.153 | 0.153 | 0.153 |

| **CRITERIA (in mg/L)** | | | |
|---|---|---|---|
| 4-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 5.60 | 8.06 | 8.06 |
| early life stages absent | 7.69 | 31.06 | 27.30 |
| 30-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 2.24 | 3.22 | 3.22 |
| early life stages absent | 3.08 | 12.42 | 10.92 |
| **EFFLUENT LIMITS (mg/L)** | | | |
| **Weekly average** | | | |
| early life stages present | 7.03 | 10.02 | 10.12 |
| early life stages absent | | 38.97 | 34.33 |
| **Monthly average** | | | |
| early life stages present | 2.96 | 4.13 | 4.25 |
| early life stages absent | | 16.36 | 14.48 |

Early life stages present limits apply during the months of May through September and the early life stages absent limits apply to October through April because burbot are not expected to be present in the receiving water.

Limits are also calculated for a warm water sport fish classification:

| **AMMONIA (as N) LIMITS** | **Cuba City** | | 2013 |
|---|---|---|---|
| **CLASSIFICATION** | **WARMWATER SPORTFISH** | | |
| EFFLUENT FLOW (mgd) | 0.3 | | |
| EFFLUENT FLOW (cfs) | 0.464 | | |
| MAX. EFFLUENT pH (s.u.) | 7.66 | | |
| **BACKGROUND INFO** | ***May – Sept.*** | ***Oct. – March*** | ***April*** |
| 7-$Q_{10}$ (cfs) | 0.25 | 0.25 | 0.25 |
| 7-$Q_2$ (cfs) | 0.375 | 0.375 | 0.375 |
| Ammonia (mg/L) | 0.06 | 0.48 | 0.11 |
| Temperature (deg C) | 23 | 3 | 9 |
| pH (std. units) | 8.21 | 7.97 | 7.97 |
| % of river flow used | 100 | 100 | 100 |
| Reference weekly flow | 0.25 | 0.25 | 0.25 |
| Reference monthly flow | 0.31875 | 0.31875 | 0.31875 |
| **CRITERIA (in mg/L)** | | | |
| 4-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 2.55 | 6.35 | 6.35 |
| early life stages absent | 2.55 | 10.31 | 9.06 |
| 30-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 1.02 | 2.54 | 2.54 |
| early life stages absent | 1.02 | 4.12 | 3.63 |
| **EFFLUENT LIMITS (in mg/L)** | | | |
| **Weekly average** | | | |
| early life stages present | 3.90 | 9.51 | **9.71** |
| early life stages absent | | **15.61** | 13.89 |

| **Monthly average** | | | |
|---|---|---|---|
| early life stages present | 1.68 | 3.95 | **4.21** |
| early life stages absent | | **6.63** | 6.04 |

Early life stages present limits apply during the months of April through September and the early life stages absent limits apply to October through March because burbot are not expected to be present in the receiving water.

**Ammonia Decay:** The more restrictive calculated limits should be used in order to protect at the point of discharge and downstream uses. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change.
Ammonia decay rates are dependent on temperature with in-stream nitrification essentially non-existent in the winter. In-stream decay is expected so a first order decay model will be used. Based on the available literature, a decay rate of 0.25 $day^{-1}$ at 20°C has been suggested as a default rate. A temperature correction factor of $\theta = 1.08$ is ($k_t = k_{20}\,\theta^{(T-20)}$).

$$N_{Limit} = \left( \frac{N_{down}}{EXP(-k_t T)} \right)$$

Where: $N_{Limit}$ = Ammonia limit needed to protect downstream use (mg/L)

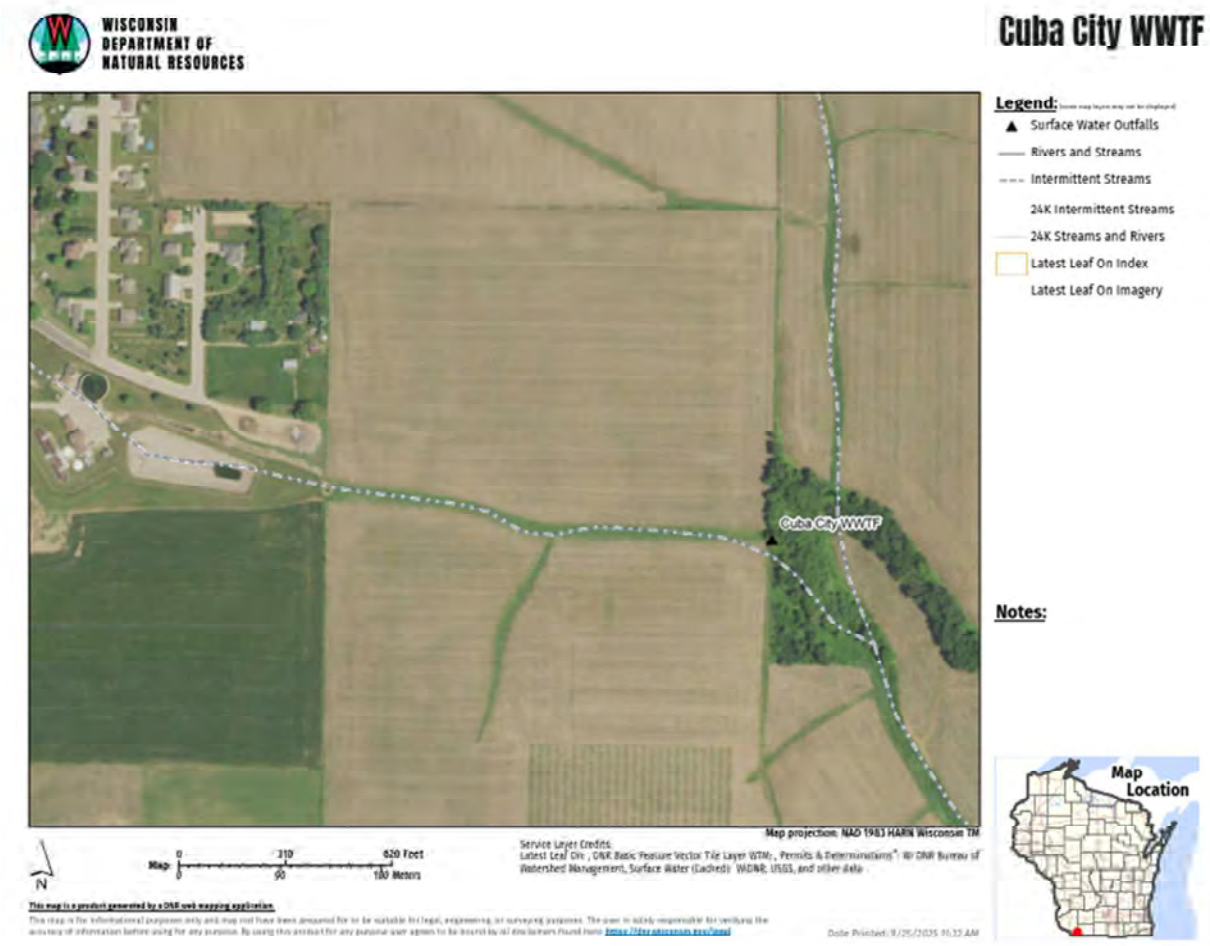
$N_{down}$ = Ammonia limit calculated based on downstream classification and flow (mg/L)

$-k_t$ = Ammonia decay rate at background stream temperature ($day^{-1}$)

T = Travel time from outfall to downstream use (day)

The velocity of receiving water is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 2.9 miles for a travel time of 0.58 days. This equation shows that at the location where the classification change, 83% of the ammonia is remaining during summer, 94% during April and 96% during winter.

**Site Map:**


WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Cuba City WWTF
Legend:
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
24K Intermittent Streams
24K Streams and Rivers
Latest Leaf On Index
Latest Leaf On Imagery
Cuba City WWTF
Notes:
Map Location
Map projection: NAD 1983 HARN Wisconsin TM
Service Layer Credits:
0 210 420 Feet
0 90 180 Meters
N
This map is a product generated by a DNR web mapping application.

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

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

February 09, 2026

Frank Raupp
City Council Alderperson PW Ch
108 N Main Street
Cuba City, WI 53807

Subject: Cuba City Wastewater Treatment Facility - WPDES Permit WI-0022217
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Frank Raupp:

The Department recently received a water quality trading plan (WQT Plan) for compliance with phosphorus effluent limits at the Cuba City Wastewater Treatment Facility. The initial plan was received in May of 2025 and updated versions were received in December of 2025 and February of 2026. Based on WDNR review, the final WQT Plan (dated February 2026) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes installation of streambank stabilization. The timeline for practice installation, as set forth in the WQT plan, indicates practices will be installed by December 2026. 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 beginning January 1st, 2027.

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-2026-0003

| Year | Available Credits (lbs/yr) – Total |
|---|---|
| 2027 | 299 |
| 2028 | 299 |
| 2029 | 299 |
| 2030 | 299 |
| 2031 | 299 |

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-2026-0003 and

will be referenced as such in the draft WPDES permit. The final WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring for total phosphorus.

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

Thank You,

BetsyJo Howe

BetsyJo Howe
South Central Region WQT Coordinator
Wisconsin Department of Natural Resources

e-CC:

George Morrissey, City of Cuba City
Peter Riddle, Town & Country Engineering, Inc.
Caitlin Oconnell, WDNR

City of Cuba City
Wisconsin

The City of Presidents

# WATER QUALITY TRADING PLAN

## City of Cuba City

**May 2025**
**(Revised February 2026)**

TOWN & COUNTRY ENGINEERING, INC.

# WATER QUALITY TRADING PLAN

City of Cuba City, Wisconsin
Wastewater Treatment Facility

May 2025
(Revised February 2026)

**TOWN & COUNTRY ENGINEERING, INC.**
Madison ♦ Rhinelander ♦ Kenosha ♦ Platteville
6264 Nesbitt Road • Madison, WI 53719 • (608) 273-3350 • tce@tcengineers.net

# WATER QUALITY TRADING PLAN

City of Cuba City, Wisconsin
Wastewater Treatment Facility

February 2026

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- Notice of Intent
- Registration Forms
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# EXECUTIVE SUMMARY

## General Overview

In 2010 the State of Wisconsin modified NR 102 and NR 217 to include new water quality-based effluent limits for phosphorus. As a result, wastewater treatment facilities (WWTF) have begun to receive water quality-based phosphorus limits in their new or re-issued Wisconsin Pollutant Discharge Elimination System (WPDES) permits from the Department of Natural Resources (DNR). As a part of the new rule, WPDES permits include a compliance schedule to evaluate compliance with these new effluent limits. The Cuba City WWTF received a re-issued permit in September of 2014. The current permit includes an interim phosphorus limit of 1.0 mg/L for monthly averages, a compliance schedule of 7-9 years with annual requirements, and target effluent limits of 0.075 mg/L for a 6-month average and 0.225 mg/L for monthly averages.

The City of Cuba City evaluated compliance options in the September 2017 Phosphorus Compliance Alternatives Plan and had previously selected to use RE-100 (SorbX) to chemically precipitate phosphorus to meet the new effluent phosphorus limits. Due to the escalating cost of these chemicals and the recent exploration of moving the City's point of phosphorus compliance for Watershed Adaptive Management, the City decided to pursue Adaptive Management in lieu of utilizing SorbX.

Cuba City has been involved with their Watershed Adaptive Management approach since 2018. With limited success the City opted to install chemical treatment to their facility, through use of alum. Chemical treatment additions were successfully completed in December of 2020, and have resulted in a marked improvement. Due to size and project availability within the Adaptive Management operational area, the City of Cuba City has chosen to now pursue Water Quality Trading as a replacement to Adaptive Management to maintain compliance with their WPDES phosphorus limits.

Provided in the Appendices of this report are signed WDNR Forms 3400-206 (Notice of Intent to Conduct Water Quality Trading) and a signed WDNR Form 3400-208 (WQT Checklist).

## Point Source and Receiving Waters

The WWTF was constructed in 1982 with a design flow of 0.3 Million Gallons per Day (MGD). Wastewater treatment is achieved through preliminary and secondary processes. Preliminary treatment processes include mechanical screening only. Secondary treatment is achieved using a single channel oxidation ditch and final clarifiers. Phosphorus removal is accomplished through a biological treatment process within the oxidation ditch, and chemical precipitation.

While most of Cuba City is located in Grant County, the City's WWTF is located in Lafayette County and discharges to the Coon Branch of the Galena River (Galena (Fever) River, GP01-Grant-Platte River Basin). The discharge point is a ditch a tributary to the Coon Branch, approximately 600 feet southeast of the WWTF.

The Coon Branch stream classification is a Limited Aquatic Life (LAL) stream at the point of discharge to the confluence with Coon Branch. It is classified as a Limited forage fishery (LFF) from the confluence of the tributary downstream to Hwy 11 Bridge and as a Warm Water Sport Fishery (WWSF) downstream of Hwy 11 bridge.

## Target Phosphorus Water Quality Trading Credits

Chemical upgrades were finalized in 2020, therefore the assessment of credits needed is based the highest effluent offset required between 2020-2024. The credit trading target value is determined by the difference between the added annual average pounds produced and new WQBEL relative to typical average flow for the same period. In 2020 the WWTF generated approximately 270 pounds of phosphorus for the year. The difference between the pounds generated and the future effluent limits associated with a Water Quality Trading WQBEL Permit would require an offset of approximately 220 pounds of phosphorus. The Cuba City WWTF plans to account for variability and aims to have a ten percent safety factor for WQT pounds on hand. A 10 percent safety factor would require a minimum of around 250 pounds of credit to be maintained in the City of Cuba City's WQT bank. This topic is further explored in Section 3 of this document.

## Phosphorus Water Quality Trade

In the Spring of 2025, a private landowner, David Houtakker was approached by Town & Country Engineering Inc, on behalf of the City of Cuba City. David and his neighbor, Robert Peart, have both entered into clearly defined and binding Water Quality Trading Agreements with the City of Cuba City, resulting in this Water Quality Trade Plan. This Water Quality Trade consists of Streambank Protections adhering to NRCS Codes 580 & 395 standards. Project and site specifics are detailed in Section 4 of this plan, and all associated supporting project information can be found in Appendix D.

The Houtakker Water Quality Trade Agreement is rooted in a planned 2,300 linear feet of streambank restoration, shaping, and armoring. It is expected that the implementation of this project will eliminate approximately 589 tons of soil from entering the water system on an annual basis. From that, this project will eliminate 627.63 pounds of phosphorus from the waterway annually. The Trade Ratio associated with this project is expected to be 2.1:1 and will therefore generate a total of 299 pounds of WQT credits to be banked by the City of Cuba City.

## Implementation

The streambank project is expected to be completed by December of 2026. Appendix A of this WQT plan contains an unsigned DNR Form 3400-207 (Water Quality Trading Management Practice Registration) for this WQT practice, alongside the WQT Checklist.

Operations and maintenance for this project consist of an annual visual inspection of the project locations to ensure that there is not excessive erosion, improvements continue to perform their streambank stabilization functions, and maintenance is being performed to the standards of the trade agreement to ensure practice integrity. This will be done by personnel from the City of Cuba City. Operations maintenance for the project can be found in Appendix D.

# 1. INTRODUCTION

## 1.1 Selected Phosphorus Compliance Alternative

The City of Cuba City evaluated compliance options in their September 2017 Phosphorus Compliance Alternatives Plan. The result of that evaluation determined that Adaptive Management was the most cost-effective approach to offset effluent phosphorus from the WWTF into the watershed. Since 2018, Cuba City, Wisconsin has pursued projects withing their actionable Watershed Adaptive Management area of interest. In the fall of 2024, the City elected to change course and pursue Water Quality Trading to expand the scope of project availability in order to offset phosphorus.

## 1.2 Community Background

Cuba City, WI, is located on State Highway 80, 10 minutes from Platteville, 12 minutes to Galena, IL and 18 minutes to Dubuque, IA. Cuba City, Wisconsin has a population of 2,138 (2020 census) an increase of 2.49% over the previous census data. The City has long been a bedroom community serving the two burgeoning economies of Platteville, WI and Dubuque, IA. Cuba City also has a thriving business park and a vibrant downtown. There is virtually no commercial space available downtown, very few residential options and no empty buildings in the Kaster-McClain Business Park. There have been two recently completed expansion projects in the Business Park and two new businesses have opened new facilities there this spring. A new 18-unit apartment building was opened in 2021. Over 40 new businesses have located in Cuba City in recent years.

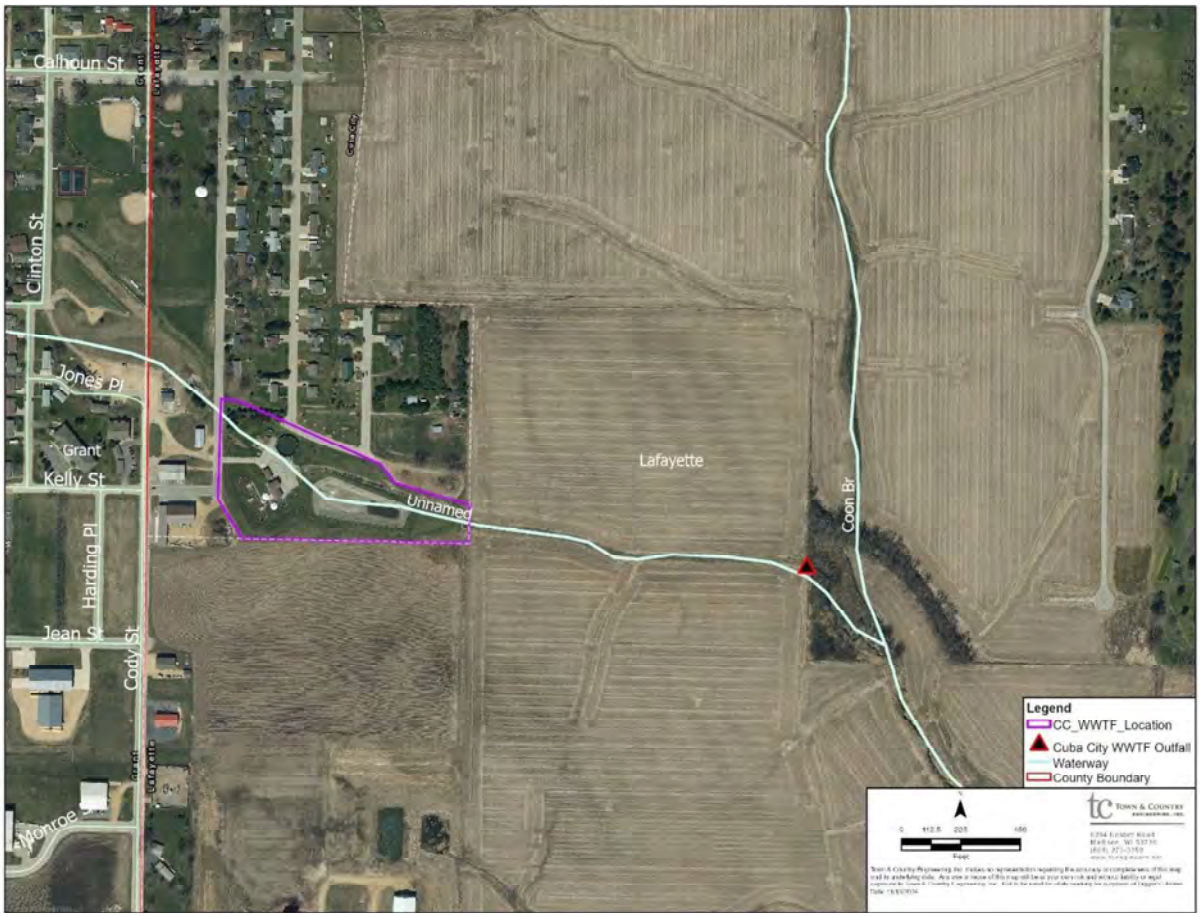
## 1.3 Existing Wastewater Facilities

The WWTF was constructed in 1982 with a design flow of 0.3 Million Gallons per Day (MGD). The City added sludge storage capacity in 1994, upgraded the aeration system in 1996, and upgraded the headworks, piping and electrical gear in 2000. The WWTF was again upgraded in 2009 when aeration and SCADA improvements were made at the facility, including the addition of DO and ORP probes as well as VFDs to improve process control and nutrient removal. The most recent upgrade included the construction of a chemical addition facility in 2020.

Wastewater treatment is achieved through preliminary and secondary processes. Preliminary treatment processes include mechanical screening only. Secondary treatment is achieved using a single channel oxidation ditch and final clarifiers. Phosphorus removal is accomplished through a biological treatment process within the oxidation ditch, and chemical precipitation. Configuration of these different zones promotes the growth of phosphorus accumulating organisms (PAOs) which have been identified as being crucial to the biological nutrient removal mechanism.

These PAOs release stored polyphosphates while in anaerobic environments and when they are in contact with VFAs. These PAOs then take up phosphorus while in the aerobic zone, which includes not only the previously released polyphosphates, but additional phosphorus in the influent wastewater. This is termed luxury uptake of phosphorus and results in a net decrease in the amount of soluble phosphorus in the liquid stream. Phosphorus is permanently removed from the liquid process through wasting of settled biomass from the final clarifiers and land applied. The chemical addition of alum amplifies the settling process by acting as a coagulant to bond to suspended solids. Wastewater flowing to the WWTF comes from a combination of residential and commercial sources within the City. The outfall location is approximately 600 feet southeast of the WWTF (Figure 1-1), discharging into an unnamed tributary to the Coon Branch Creek.

**Figure 1-1. City of Cuba City WWTF and Discharge Location**




## 1.4 Cuba City WWTF Effluent Discharge Summary

Table 1-1 is a summary of the annual average effluent discharges from the City of Cuba City WWTF Flow, BOD, Suspended Solids, Ammonia Nitrogen are based off of years 2014-2024. Phosphorus measurements are based off 2020-2024 numbers representative of the facility's chemical addition upgrades which were completed in 2020.

**Table 1-1 Summary of Annual Average Effluent Discharges**

| Parameter | Max Year | Ave. Year | Min Year | Max Month | Min Month |
|---|---|---|---|---|---|
| Flow (MGD) | 0.225 | 0.165 | 0.131 | 0.506 | 0.092 |
| BOD (lbs./day) | 10.10 | 5.95 | 3.35 | 23.85 | 1.84 |
| Suspended Solids (lbs./day) | 12.70 | 8.15 | 4.37 | 45.50 | 2.00 |
| Ammonia Nitrogen (lbs./day) | 1.20 | 0.05 | 0.14 | 10.14 | 0.09 |
| Phosphorus (mg/L) | 0.63 | 0.57 | 0.19 | 1.19 | 0.18 |
| Phosphorus (lbs./day) | 0.95 | 0.74 | 0.19 | 2.65 | 0.19 |

## 1.5 Applicable Effluent Limits

The current discharge permit for the City of Cuba City Wastewater Treatment Facility (WWTF) is Wisconsin Permit Discharge Elimination System (WPDES) number WI-0022217-10-0. The permit can be found in Appendix B and has an effective date of October 01, 2020– September 30, 2025. The Adaptive Management total phosphorus interim limit of 0.6 mg/L went into effect May 1, 2019, at the beginning the averaging period from May 1, 2019 through October 31, 2019. The current averaging periods are May through October and November through April. Compliance with the 6-month average limit has been evaluated at the end of each 6-month period on April 30th and October 31st, annually.

## 1.6 Receiving Water Description and Conditions

The Cuba City WWTF discharges to a tributary of the Coon Branch. At the point of discharge, the Coon Branch is classified as a LAL (Limited Aquatic Life) system. Per NR 102.06 Section (3) Paragraph (a), Coon Branch is not listed as having a total phosphorus criterion of 0.10 mg/L, so it shall meet a total phosphorus WQC of 0.075 mg/L.

Through the current WDNR's PRESTO modeling, the Cuba City WWTF discharges to a nonpoint source dominated receiving stream. Utilizing the WDNR Wisconsin Water Explorer, the published most likely point to nonpoint source phosphorus estimate ratio is 31:69%. Cuba City discharges into a tributary near the top of its watershed, with an average point-source Phosphorus load of 2,178 for all facilities. The reported average annual nonpoint phosphorus load stands around 5,000 pounds (Appendix C).

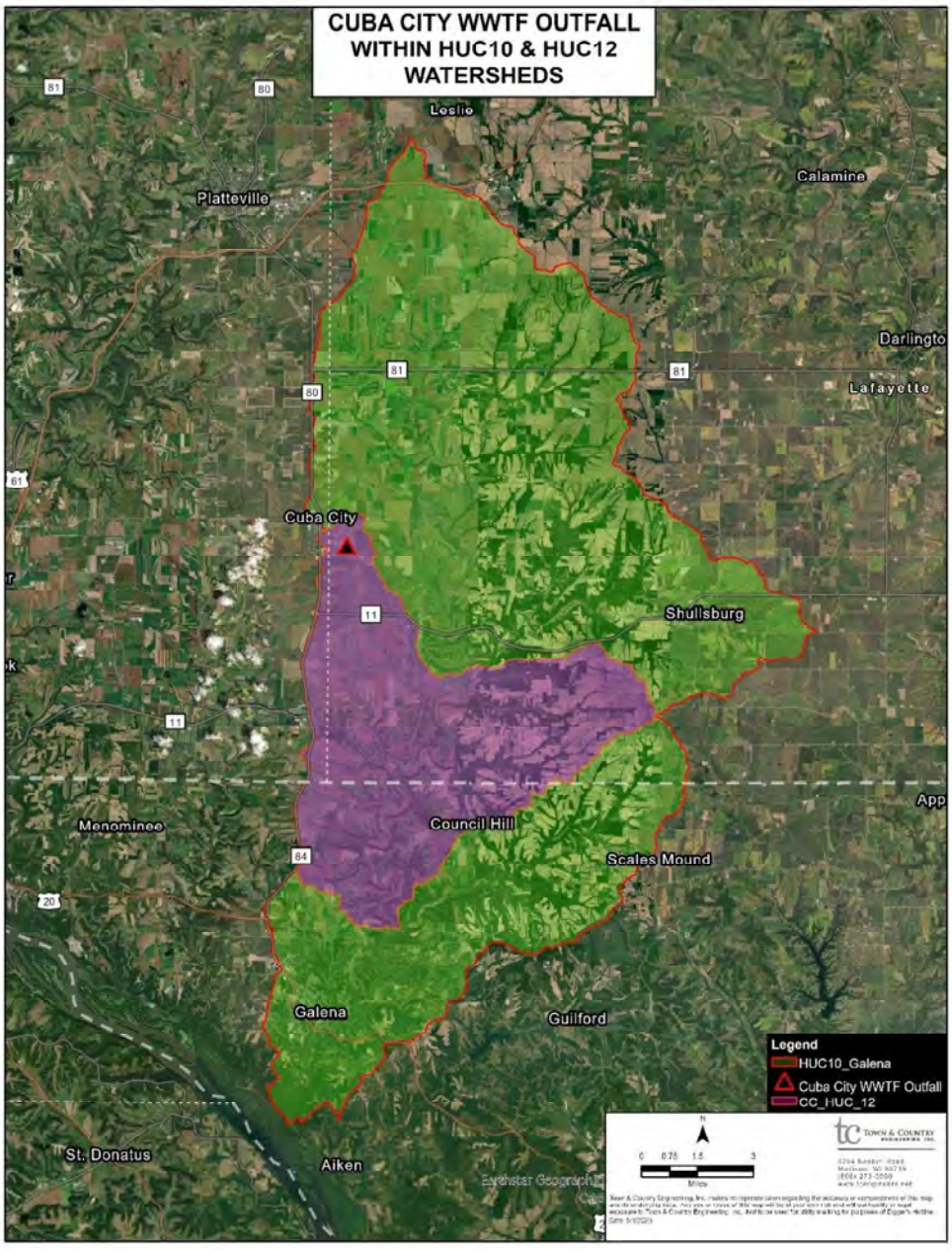
In 2020 a chemical treatment system was added as an upgrade to the facility. Currently published PRESTO modeling data predates the upgrade. Effluent phosphorus (Section 3, Table 3-3) shows the previous five year daily average discharge (pounds/day), with 2024 being the highest of the years analyzed. The total annual average for that year calculates out to approximately 365 pounds. Rounding up to 400 pounds/year (1,800-pound system reduction) the new ratio is closer to 13:87%, less than half of what is currently reported. This difference indicates that the point to nonpoint source of phosphorus ratio is well below currently published values and is well below 25% of the total Instream Phosphorus Load.

## 1.7 Watershed Description and Conditions

The Cuba City WWTF discharges into a tributary to the Coon Branch, located within the Galena River Watershed HUC-10 Code: 0706000503, and Kelsey Branch-Galena River HUC-12 Code: 070600050306. The Kelsey Branch-Galena River watershed occupies approximately 13,120 hectares, and accounts for approximately 25% of the Galena River Huc-10 (Figure 1-2).

Data on soil types was available through the NRCS's Web Soil Survey (WSS) and Soil Survey Geographic Database (SSURGO). The predominant soil types in the Kelsey Branch-Galena River watershed were Tama Silt Loam and Ashdale Silt Loam. Soil data is gathered and used in the estimating values associated with erosion as it relates to this plans WQT projects. The watershed is on the southern edge of Wisconsin Driftless area and is appropriately dominated by agricultural land which makes up approximately 60% of the HUC-12 and is accompanied by approximately 11% grass and pastureland. These two land uses define the surrounding area encompassing the projects within this trading plan. Land use data was obtained through Purdue University's Long Term Hydrologic Impact Analysis (L-THIA) model (Appendix C).

**Figure 1-2 Cuba City's WWTF Outfall Relative to the HUC-10 and HUC-12 Watersheds**



# 2. WATER QUALITY TRADING BACKGROUND

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

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

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

## 2.1 Calculation of Target Water Quality Trading Credits

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

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

## 2.2 Pollution Reduction Activities to Generate Trading Credits

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

### 2.2.1 Point-to-Point Source Water Quality Trading

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

### 2.2.2 Nonpoint-to-Point Source Water Quality Trading

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

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

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

## 2.3 Trade Ratios

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

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

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

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

### 2.3.1 Delivery Factor

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

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

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

### 2.3.2 Downstream Factor

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

### 2.3.3 Equivalence Factor

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

### 2.3.4 Uncertainty Factor

An uncertainty factor accounts for uncertainties associated with nonpoint source trades that originate from climatic variability, potential inaccuracies in field testing or modeling of the amount of pollutant controlled by a management practice, and the reliability of the management practice to perform. A list of example uncertainty factors is shown in Table 2-1.

The uncertainty factor applicable for each management practice may vary depending on how it is implemented. A more descriptive table of uncertainty factors is provided in DNR's "Guidance for Implementing Water Quality Trading In WPDES Permits", available online at https://dnr.wi.gov/topic/wastewater/WaterQualityTrading.html.

| Pollution Reduction Activities | Uncertainty Factor |
|---|---|
| **Agricultural Management Practices** | |
| Whole Field Management | 1 |
| Companion Crops | 1 |
| Conservation Easement | 1 |
| Nutrient Management | 2 – 3 |
| Production Area Diversion or Roof Runoff Structure | 2 |
| Vegetated Treatment System or Constructed Wetland | 4 |
| Sediment Control Basin | 2 |
| Streambank Stabilization & Shoreline Protection | 2 – 3 |

| | |
|---|---|
| **Dredging, Lake Treatment and Wetland Restoration** | |
| Dredging Lakes or Reservoirs | 2 – 3 |
| Dredging Rivers or Streams | 1 – 3 |
| Wetland Restoration | 1 |
| **Urban Practices** | |
| Infiltration, Stormwater Sedimentation Devices, Detention Ponds | 2 |

**Table 2-1 Uncertainty Factors**

### 2.3.5 Habitat Adjustment Factor

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

## 2.4 Environmental Benefits

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

## 3. TARGET PHOSPHORUS WATER QUALITY TRADING CREDITS

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

Cuba City WWTF's Current Phosphorus Effluent Discharge: Table 3-1 tabulates the monthly average effluent flow rate from the Cuba City WWTF for the period of January 2020 through December 2024.

**Table 3-1 Monthly Average Effluent Flow Rate**

| Month | Cuba City WWTF Monthly Average Effluent Flow Rate (MGD) | | | | |
|---|---|---|---|---|---|
| | Year | | | | |
| | **2020** | **2021** | **2022** | **2023** | **2024** |
| January | 0.128 | 0.109 | 0.132 | 0.158 | 0.114 |
| February | 0.122 | 0.108 | 0.133 | 0.190 | 0.136 |
| March | 0.270 | 0.260 | 0.170 | 0.231 | 0.127 |
| April | 0.158 | 0.198 | 0.217 | 0.152 | 0.285 |
| May | 0.147 | 0.150 | 0.179 | 0.125 | 0.202 |
| June | 0.247 | 0.132 | 0.146 | 0.093 | 0.236 |
| July | 0.228 | 0.129 | 0.184 | 0.106 | 0.278 |
| August | 0.195 | 0.137 | 0.209 | 0.105 | 0.128 |
| September | 0.162 | 0.123 | 0.131 | 0.092 | 0.101 |
| October | 0.132 | 0.152 | 0.127 | 0.101 | 0.111 |
| November | 0.130 | 0.129 | 0.137 | 0.105 | 0.163 |
| December | 0.114 | 0.127 | 0.137 | 0.110 | 0.121 |
| **Annual Avg** | **0.169** | **0.146** | **0.159** | **0.131** | **0.167** |
| Max | 0.270 | 0.260 | 0.217 | 0.231 | 0.285 |
| Min | 0.114 | 0.108 | 0.127 | 0.092 | 0.101 |

The Cuba City WWTF had an average effluent flow rate of 0.154 million gallons per day over the period of January 2020 through December 2024.

Table 3-2 tabulates the monthly average phosphorus effluent concentrations from the Cuba City WWTF for the period of January 2020 through December 2024.

**Table 3-2 Monthly Average Phosphorus Effluent Concentrations (mg/L)**

| Month | Year | | | | |
|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2024 |
| January | 0.581 | 0.514 | 0.249 | 0.220 | 0.363 |
| February | 0.938 | 0.560 | 0.191 | 0.354 | 0.288 |
| March | 0.556 | 1.069 | 0.432 | 0.353 | 0.356 |
| April | 0.724 | 0.212 | 0.407 | 0.200 | 0.565 |
| May | 1.153 | 0.420 | 0.590 | 0.262 | 0.415 |
| June | 0.542 | 0.603 | 1.035 | 0.523 | 0.576 |
| July | 0.352 | 0.903 | 1.082 | 0.903 | 1.140 |
| August | 0.402 | 0.316 | 0.604 | 0.512 | 1.005 |
| September | 0.273 | 0.363 | 0.447 | 0.503 | 0.686 |
| October | 0.602 | 1.188 | 0.750 | 0.670 | 0.508 |
| November | 0.200 | 0.502 | 0.571 | 0.893 | 0.623 |
| December | 0.313 | 0.177 | 0.509 | 0.489 | 0.973 |
| **Annual Avg** | **0.575** | **0.604** | **0.578** | **0.490** | **0.625** |
| Max | 1.153 | 1.188 | 1.082 | 0.903 | 1.140 |
| Min | 0.200 | 0.212 | 0.191 | 0.200 | 0.288 |

The Cuba City WWTF discharged an average of 0.562 mg/L of phosphorus over the period of January 2020 through December 2024.

Table 3-3 tabulates the monthly average phosphorus loading from the Cuba City WWTF for the period of January 2020 through December 2024.

**Table 3-3 Monthly Average Pounds of Phosphorus (Pounds/Day)**

| Month | Year | | | | |
|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2024 |
| January | 0.618 | 0.468 | 0.274 | 0.289 | 0.344 |
| February | 0.954 | 0.505 | 0.211 | 0.562 | 0.325 |
| March | 1.253 | 2.316 | 0.612 | 0.679 | 0.376 |
| April | 0.953 | 0.350 | 0.736 | 0.254 | 1.342 |
| May | 1.411 | 0.525 | 0.882 | 0.272 | 0.699 |
| June | 1.117 | 0.665 | 1.262 | 0.405 | 1.134 |
| July | 0.669 | 0.968 | 1.661 | 0.794 | 2.646 |
| August | 0.652 | 0.360 | 1.055 | 0.446 | 1.076 |
| September | 0.368 | 0.371 | 0.488 | 0.386 | 0.576 |
| October | 0.662 | 1.503 | 0.795 | 0.565 | 0.496 |
| November | 0.217 | 0.541 | 0.651 | 0.783 | 0.820 |
| December | 0.297 | 0.186 | 0.581 | 0.447 | 1.414 |
| **Annual Avg** | **0.764** | **0.730** | **0.767** | **0.490** | **0.937** |
| Max | 1.411 | 2.316 | 1.661 | 0.794 | 2.646 |
| Min | 0.217 | 0.186 | 0.211 | 0.254 | 0.325 |

The Cuba City WWTF discharged an average of 0.740 pounds of phosphorus per day over the period of January 2020 through December 2024.

### 3.1 Amount of Phosphorus Discharge Allowed by WQBEL

The current discharge permit for the City of Cuba City Wastewater Treatment Facility (WWTF) is Wisconsin Permit Discharge Elimination System (WPDES) number WI-0022217-10-0. The permit can be found in Appendix B and has an effective date of October 01, 2020 – September 30, 2025. The current averaging periods are May through October and November through April. Compliance with the 6-month average limit has been evaluated at the end of each 6-month period on April 30th and October 31st, annually. The Adaptive Management total phosphorus interim limit of 0.6 mg/L went into effect May 1, 2020, at the beginning the averaging period from May 1, 2020 through October 31, 2020. The expected limits upon permit reissuance will be reflective of the Total Phosphorus Index for the water body that the WWTF discharges into. Because Cuba City discharges into an unnamed tributary, it is expected that the permit will reflect State regulations relative to the water body and effluent limits will be 0.075 mg/L.

### 3.2 Calculation of Target Phosphorus Water Quality Trading Credits and Safety Factor

The credit trading target value is determined by the difference between the added annual average pounds produced and new WQBEL relative to typical average flow for the same period. The difference between the pounds generated and the future effluent limits associated with a Water Quality Trading WQBEL Permit would require an offset of approximately 220 pounds of phosphorus annually. The Cuba City WWTF plans to account for variability and aims to have a ten percent safety factor for WQT pounds on hand. A 10 percent safety factor would require a minimum of around 250 pounds of credit to be maintained in the City of Cuba City's WQT bank.

**Table 3-4 Targeted Annual WQT Credits: WWTF Average Above Future WQBEL**

| Design Flow 0.30 (MGD) | | EFFL C (mg/L) | EFFL Q (MGD) | Six Month Total (Lbs.) | Added Average Annual (Lbs.) | WQBEL Pounds @ 0.075 mg/L | Pounds In Excess of WQT WQBEL |
|---|---|---|---|---|---|---|---|
| 2020 | Jan-June | 0.753 | 0.159 | 182 | 270 | 37 | 233 |
| | July-Dec | 0.358 | 0.16 | 88 | | | |
| 2021 | Jan-June | 0.547 | 0.159 | 132 | 244 | 33 | 211 |
| | July-Dec | 0.551 | 0.133 | 112 | | | |
| 2022 | Jan-June | 0.476 | 0.163 | 117 | 266 | 36 | 230 |
| | July-Dec | 0.628 | 0.154 | 148 | | | |
| 2023 | Jan-June | 0.323 | 0.158 | 77 | 182 | 30 | 152 |
| | July-Dec | 0.320 | 0.103 | 104 | | | |
| 2024 | Jan-June | 0.430 | 0.183 | 119 | 308 | 38 | 270 |
| | July-Dec | 0.823 | 0.150 | 189 | | | |
| 5 year Annual Avg. | | 0.490 | 0.152 | 163 | 241 | 35 | **219** |

Table 3-4 tabulates six-month annual average of pounds of effluent phosphorus from January 2020 through December 2024 as they relate to the future WQBEL effluent phosphorous limits.

# 4. WATER QUALITY TRADES

In 2024 the City of Cuba City alongside David Houtakker, and neighbor Robert Peart, have taken the necessary steps to secure the long-term success of the Cities WWTF WPDES phosphorus compliance needs. Those steps have led to a successful trade agreement (Appendix A) between the City and the landowners. For this Water Quality Trading plan one area was selected for streambank protection management to produce this Water Quality Trade. Figures 4.1 and 4.2 outline the extent and location of the project for this plan. This agreement involves repair and armoring, and the upkeep of 2,340 linear feet of the Galena River (Fever River). It will also include the installation of a backwater refuge as well as rock deflectors for stream habitat. EQIP funding was selected as the cost-sharing funding source for this project. Project Design was completed by NRCS in 2021 at the request of the property owner, however due to financial obligations the project was unactionable. The City of Cuba City approached the Houtakkers with the opportunity to conduct Water Quality Trading and enter into an agreement. The City of Cuba City would fund and implement the practice of streambank restoration and protection to produce a Water Quality Trade outlined in a three party WQT agreement.

## 4.1 2025-2026 Houtakker Galena River Streambank Stabilization Project

This project is in the Blacks Creek-Galena River Watershed HUC-12 # 070600050304 (Figure 4-1). It consists of 1,650 linear feet of riprap and 690 linear feet of shaping to eliminate erosion events along this reach of the Galena River (Fever River) (Figure 4-2). Bank heights for this stretch of river range from six to nine feet in height. Lateral Recession was determined by State Hydraulics Engineer, Michael Issacson, P.E. from NRCS. Lateral recession was determined by aerial photography across years 1998, 2008, 2015, and 2021. Lateral recession ranges from just over half of a foot per year, up to 1.44 linear feet per year. These values are represented in the NRCS erosion estimator which can be found in appendix D.

Calculations from these values have produce an anticipated 627.63 pounds of phosphorus reduction from the Galena River (Table 4-1) and an anticipated 299 pounds of Water Quality Trading Credits (Table 4-3). Operations and maintenance of this project will be held to their associated NRCS standards and can be located in Appendix D.

### Implementation and Design

Water Quality Trading Guidance requires that all projects associated with streambank stabilization in the presence of cattle must be accompanied by riparian fencing or other controls to prevent destruction of streambanks. Using fencing to prevent cattle from accessing the restored portions of the sites works, but the new fencing creates an issue for the farmer in the need for continued maintenance of the fence along with concerns that the fence could impede the area during flooding.

Currently NRCS incorporates spoiled soils from streambank protection projects into the installed riprap for vegetative seeding. This typically includes the placement of salvaged topsoil over the stone from the top of bank to the water edge. This soil is then often lost when the stream floods.

This innovative approach leans heavily on the “other controls” aspect in prevention of practice deterioration. This plan and project implementation utilizes a slight variance in this design detail for this specific project, an amendment approved by NRCS engineers. Spoils will be spread only from the existing ground down to the top of rock. The logic behind this is that cattle are surefooted animals and exposed rock (riprap) would act as a deterrent from cattle access to the stream.

Currently, the property owner runs 25 cow/calf pairs and a bull, May-November, within the project area. The project area totals 190 acres, generating a animal unit (AU) per acre value of 0.26. Due to the innovative approach, the project area will be closely monitored for signs of practice failure. If WDNR determines through annual reporting that this approach is not viable a NRCS 528 Grazing Plan will be used to assist in practice preservation.

**Figure 4-1 Houtakker Property Location and HUC-12**

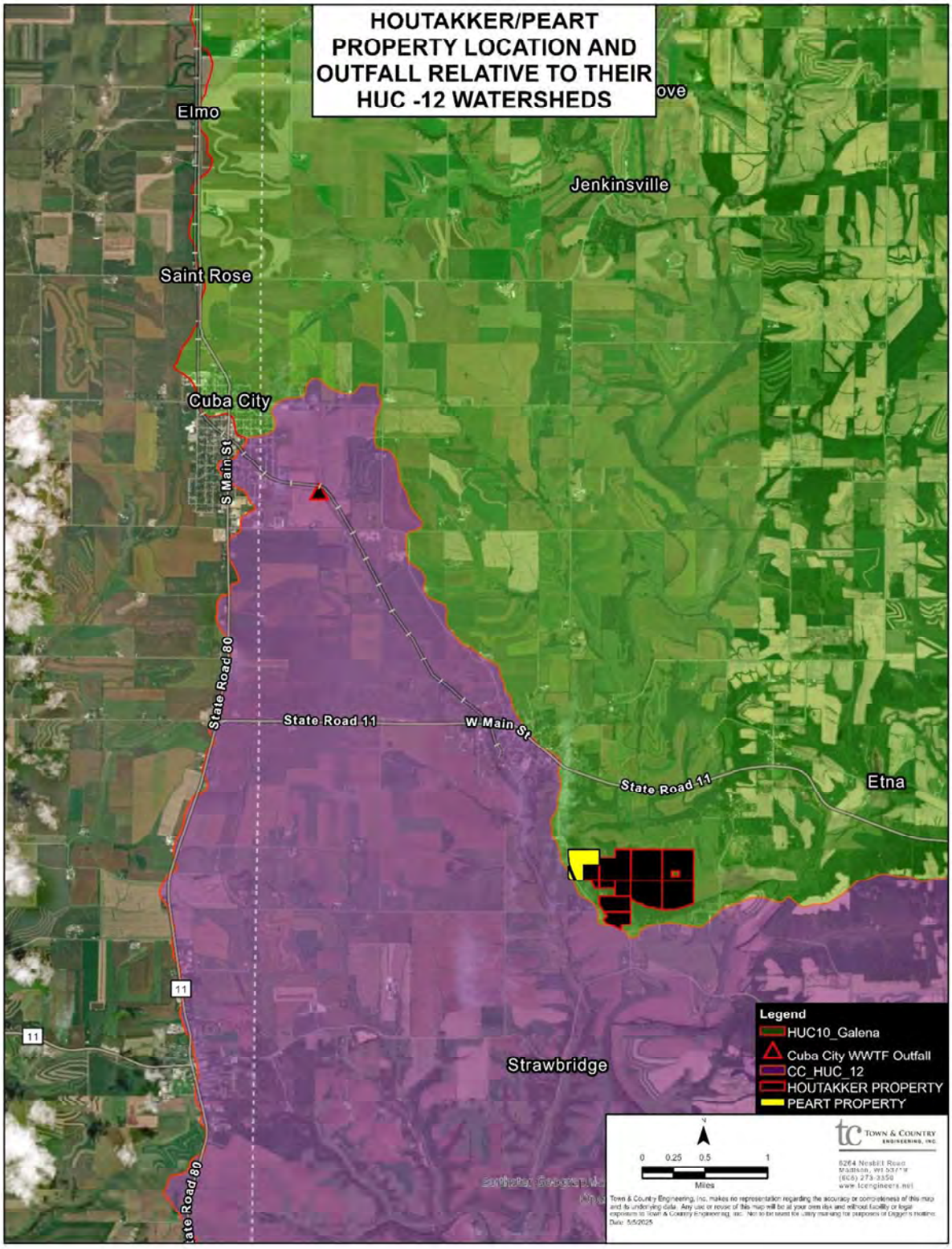
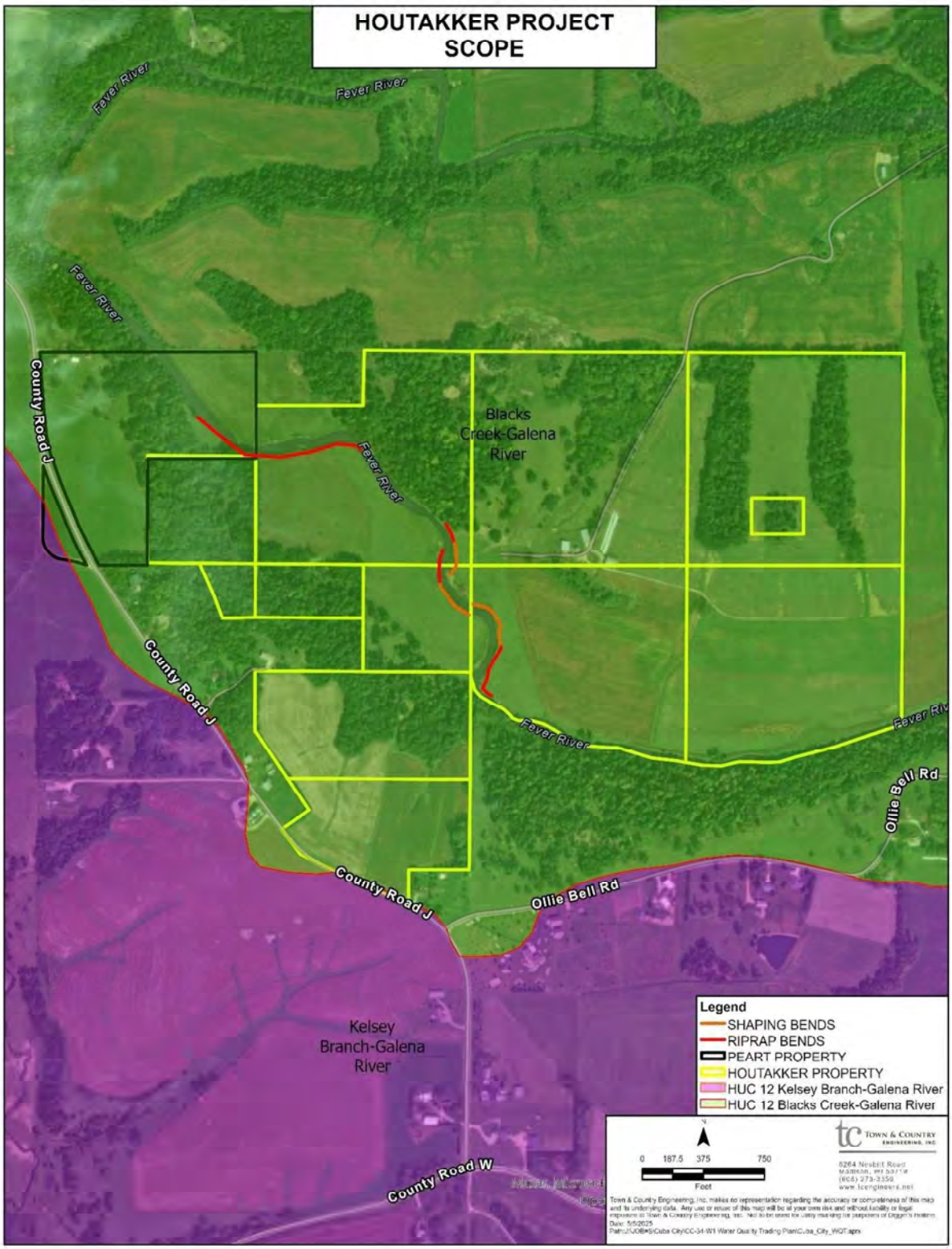


**Figure 4-2 Houtakker Property Project Scope and Location**



## 4.2 Quantification of Credits Generated and Associated Trade Ratio

Quantification of credits was completed in the spring of 2025. The NRCS Erosion Estimator was completed utilizing data generated by NRCS during the development phase of this project (Appendix D). Lateral recession, bank height and associated project lengths were measured by State Hydraulics Engineer, Michael Isaacson, PE, on November 5th, 2021. Correspondence and associated verification of values used to generate WQT credits can be found within the NRCS project design plan which are also accompanied by verified field notes (Appendix D).

Further analysis of lateral recession rates was completed in December of 2025. Lateral recession rates were recalculated utilizing a combination of historical contours and imagery for years 2010 and 2019. The results of this analysis can be found in Appendix D.

### Methods

The most likely contour associated with each year's top of bank were selected. Transects were generated at 20-foot intervals along the 2019 top of bank contour and uses to measure the distance between each of the years contours at that transect point. Transect values for each of the sites were averaged and divided by the nine-year interval between data sets. Bank height was determined by subtracting the current (2019) top of bank contour from the nearest (2019) contour associated with the top of water (indicated by a perpendicular line across the river). This approach was completed directly for project sites two through seven.

Project site one utilized a weighted average long the 975-foot project site. Bank heights varied from five to eight feet. Top of water cross stream contour elevations also varied along the project from 748-750 feet above sea level. Transects at 20-foot intervals were used to better capture the variation. Bank height at each interval was calculated by taking the elevation of the transect at that point and subtracting it from its nearest downstream cross stream contour elevation. Returned Values were then averaged to determine the height of the bank along the project site. Lateral recession for site one was completed as previously described for sites two through seven.

**Figure 4-3 Houtakker Project Shaping and Riprap Locations**

**BEND 1**

**(Bends 2-3)**

## Bend 2

**Bend 3**

**(Bends 4-5)**

## BEND 4

**BEND 5**

**(Bends 6-7)**

**BEND 6**

**BEND 7**

| BEND | LENGTH | BANK HEIGHT | LATERAL RECESSION | TONS OF SOIL | POUNDS OF PHOS. |
|---|---|---|---|---|---|
| 1 RR | 975.0 | 7.00 | 0.81 | 262.60 | 295.15 |
| 2 RR | 130.0 | 7.00 | 0.66 | 28.50 | 30.75 |
| 3 SH | 160.0 | 7.00 | 1.44 | 76.60 | 57.76 |
| 4 RR | 185.0 | 3.00 | 0.74 | 19.50 | 22.24 |
| 5 SH | 330.0 | 7.00 | 0.52 | 56.00 | 65.25 |
| 6 SH | 240.0 | 7.00 | 0.51 | 40.70 | 40.94 |
| 7 RR | 280.0 | 6.80 | 1.17 | 105.00 | 115.54 |
| | | | | **TOTAL** | **627.63** |

**Table 4-1 Phosphorus Reduction in Pounds Resulted from Volume Calculations**

Table 4-1 Summarizes the Houtakker streambank protections project values. Riprap (RR) Shaping (SH) lengths, their associated bank height and quantified lateral recession values used to calculate tons of soil and the corresponding phosphorus reductions.

**Table 4-2 Calculation of the Trade Ratio**

| Delivery Factor | Downstream Trading Factor | Equivalence Factor | Uncertainty Factor | Trade Ratio |
|---|---|---|---|---|
| 0 | 0.10 | 0 | 2 | 2.1: 1 |

Table 4-2 Display of values associated with calculation of the Trade Ratio.

**Delivery Factor:** The project location as it relates to the outfall location of the Cuba City WWTF places the project in locations with different SPARROW values. The following calculation was completed to generate this value.

$$Delivery\ Fraction\text{: } 1 - \frac{(0.60 - 0.77)}{(0.60)} = 1.28$$

$$Delivery\ Factor\text{: } \left(\frac{(1)}{1.28}\right) - 1 = -0.22$$

**Downstream Trading Factor**: This value is 0.10 because the project location is downstream and the adjusted PRESTO value indicates that the WWTF Load is less than 25% of the Total In-Stream Load (Appendix C).

**Equivalence Factor:** This value is zero because phosphorus is being traded.

**Uncertainty Factor:** The Uncertainty Factor for Streambank protection has a baseline value of (3). However, this project utilizes Habitat in the form of rock deflectors and backwater habitat. The use of habitat in the project reduces the Uncertainty factor by a value of one. Therefore, the uncertainty factor associated with this project is 2.

Reported instream phosphorus data for this section of the stream is nearly absent from records. However, in a WQBEL memo dated December 2, 2022 a current instream Total Phosphorus value of 0.178 mg/L was reported approximately 1 mile upstream from the project site. This information can be found on page 10 of 14 in the document (Appendix C.). A value of 0.178 mg/l exceeds the criterion of 0.075 mg/l. Therefore, qualifies for the habitat adjustment factor and a reduced uncertainty factor of 2.

*Habitat Adjustment: The use of Stream Habitat provides a dual purpose. From an ecological perspective, installation of stream habitat enhances the quality and quantity of instream habitat present in the reaches. This provides aquatic life greater opportunities for forage and shelter. In the case of this project Rock Deflectors are utilized. Ecological enhancement combines with an eco-engineering component. Habitat installations help to maintain and stabilize the channel, thereby controlling the flow of water and protecting outside bends, reducing erosion risk during normal flow volumes.

**Table 4-3 Expected Water Quality Trading Credits**

| Project | Pounds of Reduction | Trade Ratio | WQT CREDITS |
|---|---|---|---|
| Houtakker | 627.63 | 2.1 | 299 |

Table 4-3 Summarizes the pounds of reduction and applied trade ratio to derive the number of WQT credits that this project generates.

# 5. IMPLEMENTATION SCHEDULE AND MILESTONES

## 5.1 Implementation Timeline

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

| | |
|---|---|
| Implement WQT Management Practices | *Completed December 2026 |
| Submit Draft WQT Plan to DNR | May 2025 |
| Submit Management Practice Registration to DNR | January 1, 2027 |
| Submit Final WQT Plan to DNR | February 2026 |
| Cuba City WWTF WPDES Permit Expires | September 30, 2025 |
| WQT Credits Usage Start Date | January 01, 2027 |

*Completion date is dependent on EQIP fund dispersal for 2026

## 5.2 Water Quality Trade Practice Installation and Registration

The unsigned DNR Form 3400-207 (WQT Management Practice Registration) for the proposed water quality trades are provided Appendix A. A signed version with be submitted to WDNR and added to the plan following the anticipated completion of the project in December of 2026.

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

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

## 5.3 Tracking, Verification, and Inspection

The City of Cuba City staff will verify the performance of the streambank stabilization by performing annual site inspections, and inspections following extreme weather events will occur to ensure the terms of the maintenance plan are being complied with the 2026 Streambank Stabilization project. Photo documentation of each project site will be completed upon annual inspection. Inspection protocol dictates that no bare soil or erosion is present. Project sites will be analyzed to ensure that implemented practices continue to perform their intended streambank stabilization functions. Maintenance will be conducted should any of the above conditions not be meant and will be conducted to the standard of this approved Water Quality Trading Plan. An annual inspection report will include all structural, vegetative and habitat conditions of the approved plan. The City will take necessary action if it is notified of any non-compliance. In addition, the City of Cuba City will make its personnel available to assist the DNR with any inspections it chooses to perform of the streambank stabilization project locations.

## 5.4 Annual Water Quality Trade Report

The City of Cuba City will submit an annual report to the DNR for each of its water quality trades. The purpose of the annual report is to inform the DNR of the status of management practices, provide the DNR with an update of the trading project overall, and submit any needed changes to the plan to DNR. The annual report will include verification of the site inspections that occurred, a summary of site inspection findings, any applicable notices of termination or practice

registration, the amount of credit used each month over the calendar year; and other requirements as stated in the WPDES permit.

## 5.5 Notification of Termination

If the Water Quality Trade Agreements or this WQT Plan needs to be modified or terminated during the permit term, the City of Cuba City will submit DNR Form 3400-209 (Notice of Water Trade Agreement Termination) to the DNR. If the Water Quality Trade Agreement is modified or terminated, the phosphorus WQT credits it generates will change accordingly and may result in non-compliance with the City of Cuba City WPDES permit. The information on the notice of termination form will be used by the DNR to determine if a permit modification is required due to the termination, the termination will result in non-compliance, or other permit actions are required due to the termination.

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

# Appendix A

# WDNR Documentation

State of WisconsinDepartment of
Natural Resources101 South Webster
Street
Madison WI 53707-7921dnr.wi.gov

# Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

## Applicant Information

| Permittee Name | Permit Number WI- | Facility Site Number |
|---|---|---|

| Facility Address | City | State | ZIP Code |
|---|---|---|---|

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|

Project Name

## Broker/Exchange Information (if applicable)

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

| Broker/Exchange Organization Name | Contact Name |
|---|---|

| Address | Phone Number | Email |
|---|---|---|

## Trade Registration Information (Use a separate form for each trade agreement)

| Type | Trade Agreement Number | Practices Used to Generate Credits | Anticipated Load Reduction | Trade Ratio | Method of Quantification |
|---|---|---|---|---|---|
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | | |

| County | Closest Receiving Water Name | Land Parcel ID(s) | Parameter(s) being traded |
|---|---|---|---|

## The preparer certifies all of the following:

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

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

## Authorized Representative Signature

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

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

**Leave Blank – For Department Use Only**

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

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

# Water Quality Trading Checklist

Form 3400-208 (1/14) 

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

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| Cuba City | WI- 0022217-10-0 | 1 |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| 700 South Splinter Street | Cuba City | WI | 53807 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| George Morrissey | 108 N. Main Street | Cuba City | WI | 53807 |

Project Name
Houtakker Streambank Water Quality Trade

| Receiving Water Name | Parameter(s) being traded | HUC 12(s) |
|---|---|---|
| Coon Branch | Phosphorus | 070600050306 |

## Credit Generator Information

Credit generator type (select all that apply):

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

Are any of the credit generators in a different HUC 12 than the applicant?
- ◉ Yes; HUC 12: 07060005304
- ○ No

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

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

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

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

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

| Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.* | | | |
|---|---|---|---|
| Does plan have a narrative that describes: | | | Plan Section |
| a. Summary of discharge and existing treatment including optimization | ◯ Yes | ◯ No | |
| b. Amount of credit being generated | ◯ Yes | ◯ No | |
| c. Timeline for credits and agreements | ◯ Yes | ◯ No | |
| d. Method for quantifying credits | ◯ Yes | ◯ No | |
| e. Tracking and verification procedures | ◯ Yes | ◯ No | |
| f. Location of credit generator in proximity to receiving water and credit user | ◯ Yes | ◯ No | |
| g. Other: _____ | ◯ Yes | ◯ No | |

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

| Discharge Type | Practices Used to Generate Credits | Method of Quantification | Trade Agreement Number | Have the practice(s) been formally registered? |
|---|---|---|---|---|
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | NRCS 580 & NRCS 395 | NRCS Erosion Estimator | 001 | ◯ Yes ◉ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |
| ◯ Urban NPS ◯ Agricultural NPS ◯ Other | | | | ◯ Yes ◯ No ◯ Only in part |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Description of existing land uses | ◉ Yes | ◯ No | 1.7 |
| b. Management practices used to generate credits | ◉ Yes | ◯ No | 1 & 4 |
| c. Amount of credit being generated | ◉ Yes | ◯ No | 1 & 4 |
| d. Description of applicable trade ratio per agreement/management practice | ◉ Yes | ◯ No | 4 |
| e. Location where credits will be generated | ◉ Yes | ◯ No | 4 |
| f. Timeline for credits and agreements | ◉ Yes | ◯ No | 5 |
| g. Method for quantifying credits | ◉ Yes | ◯ No | 4 |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| h. Tracking procedures | (●) Yes | ( ) No | 5 |
| i. Conditions under which the management practices may be inspected | (●) Yes | ( ) No | 5 |
| j. Reporting requirements should the management practice fail | (●) Yes | ( ) No | 5 |
| k. Operation and maintenance plan for each management practice | (●) Yes | ( ) No | 4 & App. D |
| l. Location of credit generator in proximity to receiving water and credit user | (●) Yes | ( ) No | 1 |
| m. Practice registration documents, if available | (●) Yes | ( ) No | Appendix A |
| n. History of project site(s) | (●) Yes | ( ) No | 1 & 4 |
| 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 |
|---|---|
| Rita C. Lin | 05/05/2025 |

**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 |
|---|---|
| George Morrison | 05/05/25 |

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

# Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14) 

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

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| CITY OF CUBA CITY | WI- 0022217-10-0 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| 700 SOUTH SPLINTER STREET | CUBA CITY | WI | 53807 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| GEORGE MORRISSEY | 108 N. MAIN STREET | CUBA CITY | WI | 53807 |

Project Name
CUBA CITY WATER QUALITY TRADING

| Receiving Water Name | Parameter(s) being traded | HUC 12(s) |
|---|---|---|
| COON BRANCH | PHOSPHORUS | 070600050306 |

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

## Credit Generator Information

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

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

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

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

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

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

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

List the practices that will be used to generate credits:

STREAMBANK STABALIZATION AND SHORELINE PROTECTIONS NRCS 580 & NRCS 395 (WITH AQUATIC HABITAT ADJUSTMENTS)

Method for quantifying credits generated:

- ☒ Monitoring
- ☒ Modeling, Names: NRCS EROSION EST.
- ☐ 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 | Date Signed |
|---|---|
| | 10/7/2024 |

**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 |
|---|---|
| | 10/15/24 |

State of WisconsinDepartment of
Natural Resources101 South Webster
Street
Madison WI 53707-7921dnr.wi.gov

# Notification of Water Trade Agreement Termination

Form 3400-209 (1/14)

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

## Applicant Information

| Permittee Name | Permit Number WI- | Facility Site Number |
|---|---|---|

| Facility Address | City | State | ZIP Code |
|---|---|---|---|

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|

Project Name

## Credit Generator Information

Credit generator type (select all that apply):

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

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

| Amount of trading credit being terminated | Effective date of termination |
|---|---|

Reason for termination

Is this agreement being updated or replaced?

- ◯ Yes
- ◯ No
- ◯ Unsure

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

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

## The preparer certifies all of the following:

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

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

## Authorized Representative Signature

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

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

# Appendix B

# WWTF Documents

# WPDES PERMIT

## *STATE OF WISCONSIN*
## *DEPARTMENT OF NATURAL RESOURCES*

**PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**CITY OF CUBA CITY**

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
700 SOUTH SPLINTER STREET, CUBA CITY, WISCONSIN
to

**TRIBUTARY TO COON BRANCH (GALENA [FEVER] RIVER WATERSHED, GP01 – GRANT-PLATTE RIVER BASIN) IN LAFAYETTE COUNTY**

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Thomas Bauman
Wastewater Field Supervisor

_____
Date Permit Signed/Issued

**PERMIT TERM: EFFECTIVE DATE - October 01, 2020** **EXPIRATION DATE - September 30, 2025**

# TABLE OF CONTENTS

# 1 Influent Requirements

## 1.1 Sampling Point(s)

| Sampling Point Designation | |
|---|---|
| **Sampling Point Number** | **Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)** |
| 701 | Representative influent samples shall be collected after screening. |

## 1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

### 1.2.1 Sampling Point 701 - INFLUENT

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Continuous | Continuous | |
| $BOD_5$, Total | | mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | | mg/L | 3/Week | 24-Hr Flow Prop Comp | |

# 2 Surface Water Requirements

## 2.1 Sampling Point(s)

| Sampling Point Designation | |
|---|---|
| **Sampling Point Number** | **Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)** |
| 001 | Representative effluent samples shall be collected at the chlorine contact tank, prior to discharge to the Coon Branch. |
| 601 | Representative water samples and flow shall be collected from Coon Branch. Sample point 601 is located downstream of the Cuba City WWTF outfall, where Coon Branch meets Roaster Road (42.59473 N/90.41224 W). Sample point 601 correlates with the sample point described in the approved AM Plan No. WQT-2019-0001. |

## 2.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

### 2.2.1 Sampling Point (Outfall) 001 - EFFLUENT

| Monitoring Requirements and Effluent Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Continuous | Continuous | |
| $BOD_5$, Total | Weekly Avg | 30 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| $BOD_5$, 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 | 3/Week | Grab | |
| pH Field | Daily Min | 6.0 su | 3/Week | Grab | |
| Dissolved Oxygen | Daily Min | 4.0 mg/L | 3/Week | Grab | |
| Nitrogen, Ammonia ($NH_3$-N) Total | Daily Max | 15 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia ($NH_3$-N) Total | Weekly Avg | 10 mg/L | 3/Week | 24-Hr Flow Prop Comp | April 1 through April 30 |
| Nitrogen, Ammonia ($NH_3$-N) Total | Weekly Avg | 4.7 mg/L | 3/Week | 24-Hr Flow Prop Comp | May 1 through September 30 |
| Nitrogen, Ammonia ($NH_3$-N) Total | Weekly Avg | 16 mg/L | 3/Week | 24-Hr Flow Prop Comp | October 1 through March 31 |
| Nitrogen, Ammonia ($NH_3$-N) Total | Monthly Avg | 4.5 mg/L | 3/Week | 24-Hr Flow Prop Comp | April 1 through April 30 |
| Nitrogen, Ammonia ($NH_3$-N) Total | Monthly Avg | 2.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | May 1 through September 30 |

| Monitoring Requirements and Effluent Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Ammonia ($NH_3$-N) Total | Monthly Avg | 6.9 mg/L | 3/Week | 24-Hr Flow Prop Comp | October 1 through March 31 |
| Phosphorus, Total | Monthly Avg | 1.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | This is an Adaptive Management interim limit, effective immediately. |
| Phosphorus, Total | 6-Month Avg | 0.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | This is the Adaptive Management interim limit that will go into effect May 1, 2021. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 5.1. |
| Phosphorus, Total | | lbs/day | 3/Week | Calculated | Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphours sampling occurs. Daily mass (lbs/day) = daily concentration (mg/L) x daily flow (MGD) x 8.34. |
| Chloride | Monthly Avg | 450 mg/L | 4/Month | 24-Hr Flow Prop Comp | This is an interim limit. Sampling shall be done on four consecutive days one week per month. See Chloride Variance section below and the Schedules section for applicable target value. |
| Chloride | | lbs/day | 4/Month | Calculated | Sampling shall be done on four consecutive days one week per month. See Chloride Variance section below and the Schedules section for applicable target value. |
| Nitrogen, Total Kjeldahl | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring section below. |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring section below. |

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

### 2.2.1.1 Annual Average Design Flow

The annual average design flow of the permittee's wastewater treatment facility is 0.30 MGD.

### 2.2.1.2 Whole Effluent Toxicity (WET) Testing

**Primary Control Water:** Coon Branch

**Instream Waste Concentration (IWC):** 65%

**Dilution series:** At least five effluent concentrations and dual controls must be included in each test.

- **Chronic:** 100, 75, 50, 25, 12.5% and any additional selected by the permittee.

**WET Testing Frequency:**

**Chronic** tests shall be conducted twice during the permit term in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

Tests are required during the following quarters.

- **Chronic:** April 1, 2022 – June 30, 2022; July 1, 2024 – September 30, 2024

  Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in July 1, 2025 – September 30, 2025.

**Testing:** WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

**Reporting:** The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

**Determination of Positive Results:** A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic ($TU_c$) is greater than 1.54 for either species. The $TU_c$ shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

**Additional Testing Requirements:** Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90-day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

### 2.2.1.3 Chloride Variance – Implement Source Reduction Measures

This permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the chloride source reduction measures specified below, (c) follow the approved Source Reduction Plan and (d) perform the actions listed in the schedule. (See the Schedules section herein.):

- City public works employees to attend training seminars and educational programs to raise awareness on chlorides reduction.
- Present an annual update to City's public officials on the progress made in reducing chlorides and educate them on why further reductions are needed.
- Mail water softener information brochure with sewer bill. The information focuses on timer vs. on-demand systems and how to optimize each type of softener.
- Post the water softener informational brochure on the City website.
- Provide training to Public Works staff regarding the optimization of road salt.
- Conduct an open house at the sewer plant (tour and educational sessions).
- Work with local plumbers to establish a rebate or incentive program to assist in funding replacement of timer-based softeners in the City.
- Track the program incentives on an annual basis to record the location and number of new on-demand systems installed.
- Develop and implement a City ordinance to offer a rebate for water softener optimization, inspection, and/or replacement.
- Survey residents on water softening equipment and practices. This will be conducted as part of the free inspections offered by local plumbers.
- Meet with all industrial/commercial water uses and document visits; look at their softening equipment with trained professionals.
- Continue tracking and recording the monthly effluent concentration data at the WWTF.
- Continue the rehabilitation of sanitary manholes and record this information as part of the City's CMOM program.
- Investigate the calibration of water softeners at all public buildings.

### 2.2.1.4 Total Phosphorus Interim Limit, Averaging Periods and Compliance Determination

The adaptive management total phosphorus interim limit of 0.6 mg/L goes into effect beginning the period from May 1 1, 2020 through October 31, 2020. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30$^{th}$ and October 31$^{st}$ annually.

### 2.2.1.5 2.2.1.5 Phosphorus Limitation(s) and Adaptive Management Requirements

Cuba City has requested and the Department has approved a plan to implement a watershed adaptive management approach under s. NR 217.18, Wis. Adm. Code and s. 283.13(7) Wis. Stats. as a means for Cuba City to achieve compliance with the phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code. The phosphorus limitations and conditions in this permit reflect the approved adaptive management plan WQT-2019-0003(February 2019). Failure to implement terms and conditions of this section is a violation of this permit. The permittee shall design and implement the actions identified in AM Plan No. WQT-2019-0003(February 2019) in accordance with the goals and measures identified in the approved plan. If total phosphorus loadings within the receiving stream, as identified in WQT-2019-0003 (February 2019), are not reduced by at least 280 pounds per year by September 30, 2025 the watershed adaptive management option may not be available to the permittee upon permit reissuance.

Pursuant to s. NR 217.18(3)(e)2, Wis. Adm. Code, the adaptive management interim limitation is 0.6 mg/L, expressed as a six-month average. Additionally, a 1.0 mg/L limitation expressed as a monthly average is required. The final calculated water quality based effluent limitations for phosphorus are a six-month seasonal average limitation of 0.075 mg/L and a month average limitation of 0.22 mg/L based on current in-stream phosphorus data. These limitations may be recalculated based on changes in the in-stream data at the time of permit reissuance. These limits will become effective at the end of four permit terms unless the adaptive management project is terminated per s. NR 217.18(3)(g), Wis. Adm. Code, in which case the limits may be imposed at an earlier date, or the phosphorus reductions specified in the adaptive management plan have been achieved.

### 2.2.1.6 Adaptive Management Requirements – Optimization

The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. NR 217.18(3)(c), Wis. Adm. Code.

### 2.2.1.7 Nitrogen Series Monitoring

- Monitoring for Total Kjeldahl Nitrogen (TKN), Nitrite + Nitrate Nitrogen, and Total Nitrogen shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. **October – December 2020; January – March 2021; April – June 2022; July – September 2023; October – December 2024; January – March 2025.**

Nitrogen Series monitoring shall continue after the permit expiration date (until the permit is reissued) in accordance with the monitoring requirements specified in the last full calendar year of this permit. For example, the next test would be required in **October – December 2026**.

**Testing:** Monitoring shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during testing.

## 2.2.2 Sampling Point 601 - In-Stream Sampling Point 601

| Monitoring Requirements and Effluent Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | cfs | 1/ 2 Weeks | Measure | Provide a measurement of river flow for each day that in-stream phosphorus monitoring is performed. |
| Phosphorus, Total | | mg/L | 1/ 2 Weeks | Grab | |

| Monitoring Requirements and Effluent Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Phosphorus, Total | | lbs/month | Monthly | Total Monthly | See section 3.2.2.3 below or Standard Requirement 6.4.2 for calculation of monthly loads. |

### 2.2.2.1 Surface Water Sampling for Total Phosphorus

When sampling surface waters for total phosphorus, sample collection and handling protocol as specified in Chapter 4 of the "Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges" shall be followed. (Available at dnr.wi.gov; search for "phosphorus guidance").
When testing for total phosphorus in surface water samples, use the test procedures specified by Standard Requirement 5.1.2. Analytical methods used shall enable the laboratory to quantitate total phosphorus at levels below the water quality criterion of 0.075 mg/L. If the required level of quantitation cannot be met by any of the methods available in ch. NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected.
When surface water samples are collected by Water Action Volunteers, the "The Volunteer Monitor's Guide To Quality Assurance Project Plans" shall be implemented. (Available at www.epa.gov; search for "The Volunteer Monitor's Guide To Quality Assurance Project Plans").

### 2.2.2.2 Voluntary Surface Water Sampling for Total Phosphorus

River flow and total phosphorus may voluntarily be performed from November 1 through April 30 annually. When voluntary in-stream monitoring is completed monitoring results shall be reported on the monthly eDMR. Report river flow measurements for each day phosphorus monitoring is performed.

### 2.2.2.3 Reporting Surface Water Sampling Results for Total Phosphorus and Flow

The permittee shall report total phosphorus monitoring results for surface waters samples collected at Sampling Point 601 and river flow measurements at Sampling Point 601 on monthly eDMRs. The monitoring results shall be submitted by the date specified on the eDMR.
In addition, all total phosphorus test results for surface water samples collected at Sampling Point 601 and all other surface water sampling points identified in Adaptive Management Plan No. WQT-2019-0003 (February 2019) shall be reported to the Department using the Department's Laboratory Data Entry System (LDES). Test results for the year shall be submitted by January 21st of the following year. (Available at dnr.wi.gov; search "Laboratory Data Entry System").

### 2.2.2.4 Total Monthly Total Phosphorus (TP) Loads

Use the following methods to calculate the total monthly phosphorus loading in the receiving stream expressed as a mass in lbs/month:

1) Convert mg/L to lbs/day using the following equation:

   Daily TP loading (lbs/day) = TP concentration (mg/L) × [Daily Flow (cfs) ÷ 1.55] × 8.34

2) On a monthly basis, average the reported daily TP loading, then multiply the average by the number of days during the month and report the product as "Phosphorus, Total" (in lbs/month) for the last day of the month on the eDMR.

   Phosphorus, Total (lbs/month) = Average of daily TP loading (lbs/day) × Number of days/month

# 3 Land Application Requirements

## 3.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

| Sampling Point Designation | |
|---|---|
| **Sampling Point Number** | **Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)** |
| 003 | Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge storage tanks. |

## 3.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

### 3.2.1 Sampling Point (Outfall) 003 - SLUDGE

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Jan. 1, 2022 - Dec. 31, 2022. |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Jan. 1, 2022 - Dec. 31, 2022. |
| Solids, Total | | Percent | Annual | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Annual | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Annual | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Annual | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Annual | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Annual | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Annual | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Annual | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Annual | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Annual | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Annual | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Annual | Composite | |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Nitrogen, Ammonium ($NH_4$-N) Total | | Percent | Annual | Composite | |
| Phosphorus, Total | | Percent | Annual | Composite | |
| Phosphorus, Water Extractable | | % of Tot P | Annual | Composite | |
| Potassium, Total Recoverable | | Percent | Annual | Composite | |

| Other Sludge Requirements | |
|---|---|
| **Sludge Requirements** | **Sample Frequency** |
| **List 3 Requirements – Pathogen Control:** The requirements in List 3 shall be met prior to land application of sludge. | **Annual** |
| **List 4 Requirements – Vector Attraction Reduction:** The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4. | **Annual** |

### 3.2.1.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified.

### 3.2.1.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

### 3.2.1.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

### 3.2.1.4 Sludge Which Exceeds the High-Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high-quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

### 3.2.1.5 Sludge Analysis for PCBs

The permittee shall analyze the sludge for Total PCBs one time during **2022**. The results shall be reported as "PCB Total Dry Wt". Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with Table EM in s. NR 219.04, Wis. Adm. Code and the conditions specified in Standard Requirements of this permit. PCB results shall be submitted by January 31, following the specified year of analysis.

### 3.2.1.6 Lists 1, 2, 3, and 4

| **List 1**<br>**TOTAL SOLIDS AND METALS**<br>See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters |
|---|
| Solids, Total (percent) |
| Arsenic, mg/kg (dry weight) |
| Cadmium, mg/kg (dry weight) |
| Copper, mg/kg (dry weight) |
| Lead, mg/kg (dry weight) |
| Mercury, mg/kg (dry weight) |
| Molybdenum, mg/kg (dry weight) |
| Nickel, mg/kg (dry weight) |
| Selenium, mg/kg (dry weight) |
| Zinc, mg/kg (dry weight) |

| **List 2**<br>**NUTRIENTS**<br>See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters |
|---|
| Solids, Total (percent) |
| Nitrogen Total Kjeldahl (percent) |
| Nitrogen Ammonium (NH4-N) Total (percent) |
| Phosphorus Total as P (percent) |
| Phosphorus, Water Extractable (as percent of Total P) |
| Potassium Total Recoverable (percent) |

**List 3**
**PATHOGEN CONTROL FOR CLASS B SLUDGE**

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

| Parameter | Unit | Limit |
|---|---|---|
| Fecal Coliform* | MPN/gTS or CFU/gTS | 2,000,000 |
| **OR**, ONE OF THE FOLLOWING PROCESS OPTIONS | | |
| Aerobic Digestion | Air Drying | |
| Anaerobic Digestion | Composting | |
| Alkaline Stabilization | PSRP Equivalent Process | |

* The Fecal Coliform limit shall be reported as the geometric mean of 7 discrete samples on a dry weight basis.

**List 4**
**VECTOR ATTRACTION REDUCTION**

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

| Option | Limit | Where/When it Shall be Met |
|---|---|---|
| Volatile Solids Reduction | ≥38% | Across the process |
| Specific Oxygen Uptake Rate | ≤1.5 mg $O_2$/hr/g TS | On aerobic stabilized sludge |
| Anaerobic bench-scale test | <17 % VS reduction | On anaerobic digested sludge |
| Aerobic bench-scale test | <15 % VS reduction | On aerobic digested sludge |
| Aerobic Process | >14 days, Temp >40°C and Avg. Temp > 45°C | On composted sludge |
| pH adjustment | >12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours) | During the process |
| Drying without primary solids | >75 % TS | When applied or bagged |
| Drying with primary solids | >90 % TS | When applied or bagged |
| Equivalent Process | Approved by the Department | Varies with process |
| Injection | - | When applied |
| Incorporation | - | Within 6 hours of application |

### 3.2.1.7 Daily Land Application Log

| Daily Land Application Log | | |
|---|---|---|
| **Discharge Monitoring Requirements and Limitations**<br>The permittee shall maintain a daily land application log for biosolids land applied each day when land application occurs. The following minimum records must be kept, in addition to all analytical results for the biosolids land applied. The log book records shall form the basis for the annual land application report requirements. | | |
| **Parameters** | **Units** | **Sample Frequency** |
| DNR Site Number(s) | Number | Daily as used |
| Outfall number applied | Number | Daily as used |
| Acres applied | Acres | Daily as used |
| Amount applied | As appropriate * /day | Daily as used |
| Application rate per acre | unit */acre | Daily as used |
| Nitrogen applied per acre | lb/acre | Daily as used |
| Method of Application | Injection, Incorporation, or surface applied | Daily as used |

*gallons, cubic yards, dry US Tons or dry Metric Tons

# 4 Schedules

## 4.1 Adaptive Management Interim Limit Compliance Update

| Required Action | Due Date |
|---|---|
| **Progress Report:** Submit a progress report on the ability of the wastewater treatment facility to consistently meet the Adaptive Management interim effluent limit of 0.6 mg/L as a 6-month seasonal average with averaging periods of May through October and November through April. | 03/31/2021 |
| **Comply with Adaptive Management Interim Limit:** The Adaptive Management interim effluent limit of 0.6 mg/L as a six-month seasonal average goes into effect. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6 month period on April 30 and October 31 annually. | 10/31/2021 |

## 4.2 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM Plan No. WQT-2019-0003 (February 2019).

| Required Action | Due Date |
|---|---|
| **Annual Adaptive Management Report:** Submit an annual adaptive management progress report. The annual adaptive management progress report shall:<br>- Identify those actions from section 4 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress;<br>- Evaluate collected monitoring data;<br>- Document progress in achieving the goals and measures identified in the approved adaptive management plan;<br>- Describe the outreach and education efforts that occurred during the past calendar year;<br>- Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code;<br>and<br>- Describe any updates needed to Cuba City's approved phosphorus optimization plan. | 01/31/2021 |
| **Annual Adaptive Management Report #2:** Submit an adaptive management progress report as defined above. | 01/31/2022 |
| **Annual Adaptive Management Report #3:** Submit an adaptive management progress report as defined above. | 01/31/2023 |
| **Annual Adaptive Management Report #4:** Submit an adaptive management progress report as defined above. | 01/31/2024 |
| **Renewal of Adaptive Management Plan for Permit Reissuance:** If the permittee intends to seek renewal of AM plan No. WQT-2019-0003 (February 2019) per s. NR 2017.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2019-0003 (February 2019) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non- | 03/31/2024 |

| | |
|---|---|
| point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area. | |
| **Final Adaptive Management Report for 1st Permit Term:** Submit the final adaptive management report documenting the success in meeting the watershed phosphorus reduction target of 280 lbs/year, as well as the anticipated future reduction in phosphorus sources and phosphorus effluent concentrations. The report shall summarize adaptive management activities that have been implemented during the current permit term and state which, if any, actions from the approved adaptive management plan WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends in effluent and in-stream monthly and six-month average phosphorus concentrations and total mass of phosphorus based on phosphorus sampling and flow data of effluent and in the Coon Branch of the Galena River during the current permit term. The report shall also include an analysis of how effluent phosphorus varies with time and with significant loadings of phosphorus such as loads from large storm events. Additionally the report shall include proposed adaptive management goals and actions for negotiations with the Department if the permittee intends to seek a renewed adaptive management plan per s. NR 217.18, Wis. Adm. Code, for the reissued permit. | 01/31/2025 |
| **Annual Adaptive Management Report #5:** Submit an Adaptive Management progress report as defined above. | 01/31/2026 |
| **Annual Adaptive Management Report #6:** Submit an Adaptive Management progress report as defined above. | 01/31/2027 |
| **Annual Adaptive Management Report #7:** Submit an Adaptive Management progress report as defined above. | 01/31/2028 |
| **Annual Adaptive Management Report #8:** Submit an Adaptive Management progress report as defined above. | 01/31/2029 |
| **Renewal of Adaptive Management Plan for Permit Reissuance:** If the permittee intends to seek renewal of AM plan No. WQT-2019-0003 (February 2019) per s. NR 2017.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2019-0003 (February 2019) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area. | 03/31/2030 |
| **Final Adaptive Management Report for 2nd Permit Term:** Submit the final adaptive management report documenting the success in meeting the watershed phosphorus reduction target of 2250 lbs/year, as well as the anticipated future reduction in phosphorus sources and phosphorus effluent concentrations. The report shall summarize adaptive management activities that have been implemented during the current permit term and state which, if any, actions from the approved adaptive management plan WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends in effluent and in-stream monthly and six-month average phosphorus concentrations and total mass of phosphorus based on phosphorus sampling and flow data of effluent and in the Coon Branch of the Galena River during the current permit term. The report shall also include an analysis of how effluent phosphorus varies with time and with significant loadings of phosphorus such as loads from large storm events. Additionally the report shall include | 01/31/2030 |

| | |
|---|---|
| proposed adaptive management goals and actions for negotiations with the Department if the permittee intends to seek a renewed adaptive management plan per s. NR 217.18, Wis. Adm. Code, for the reissued permit. | |
| **Annual Adaptive Management Report #9:** Submit an Adaptive Management progress report as defined above. | 01/31/2031 |
| **Annual Adaptive Management Report #10:** Submit an Adaptive Management progress report as defined above. | 01/31/2032 |
| **Annual Adaptive Management Report #11:** Submit an Adaptive Management progress report as defined above. | 01/31/2033 |
| **Final Adaptive Management Report:** Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 2996 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions. | 01/31/2034 |
| **Achieve Water Quality Standards and Adaptive Management Plan Success:** All the receiving waters identified with the AM plan, WQT-2019-0003 (February 2019), shall comply with water quality standards specified in s. NR 102.06, Wis. Adm. Code. Achieving water quality standards at identified monitoring stations means the AM plan was successful. The permittee shall continue to comply with applicable effluent limits (required under s. 217.18(3)(e)3. expressed as a 6-month avg and continue monitoring surface waters at a minimum of monthly May through October for total phosphorus. | 09/30/2034 |

## 4.3 Chloride Target Value

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

| Required Action | Due Date |
|---|---|
| **Annual Chloride Progress Report:** Submit an annual chloride progress report. The annual chloride progress report shall:<br><br>Indicate which chloride source reduction measures or activities in the approved Source Reduction Plan have been implemented;<br><br>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and<br><br>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.<br><br>Note that the interim limitation of 450 mg/L remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due. | 01/31/2021 |

| | |
|---|---|
| **Annual Chloride Progress Report #2:** Submit the chloride progress report as defined above. | 01/31/2022 |
| **Annual Chloride Progress Report #3:** Submit the chloride progress report as defined above. | 01/31/2023 |
| **Annual Chloride Progress Report #4:** Submit the chloride progress report as defined above. | 01/31/2024 |
| **Final Chloride Report:** Submit the final chloride report documenting the success in meeting the chloride target value of 415 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Source Reduction Plan were not pursued and why. The report shall include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.<br><br>Additionally the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit.<br><br>Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures, but is not an enforceable limitation under the terms of this permit. | 01/31/2025 |
| **Annual Chloride Reports After Permit Expiration:** In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends. | |

# 5 Standard Requirements

**NR 205, Wisconsin Administrative Code:** The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

## 5.1 Reporting and Monitoring Requirements

### 5.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

### 5.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

### 5.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

### 5.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for $BOD_5$ and Total Suspended Solids shall be considered to be limits of quantitation

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a 0 (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

## 5.1.5 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted and certified by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

The CMAR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The certification verifies that the electronic report is true, accurate and complete.

## 5.1.6 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information, including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

### 5.1.7 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

### 5.1.8 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

## 5.2 System Operating Requirements

### 5.2.1 Noncompliance Reporting

Sanitary sewer overflows and sewage treatment facility overflows shall be reported according to the 'Sanitary Sewer Overflows and Sewage Treatment Facility Overflows' section of this permit.

The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.

**NOTE**: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill**. **To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003.**

### 5.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

### 5.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-555, Wis. Adm. Code.

### 5.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

### 5.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

### 5.2.6 Bypass

This condition applies only to bypassing at a sewage treatment facility that is not a scheduled bypass, approved blending as a specific condition of this permit, a sewage treatment facility overflow or a controlled diversion as provided in the sections titled 'Scheduled Bypass', 'Blending' (if approved), 'SSO's and Sewage Treatment Facility Overflows' and 'Controlled Diversions' of this permit. Any other bypass at the sewage treatment facility is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the Noncompliance Reporting section of this permit.

### 5.2.7 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the 'Controlled Diversions' section of this permit,

the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee's written request for Department approval of a scheduled bypass shall demonstrate that the conditions for bypassing specified in the above section titled 'Bypass' are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

### 5.2.8 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation. Sewage treatment facilities that have multiple treatment units to treat variable or seasonal loading conditions may shut down redundant treatment units when necessary for efficient operation. The following requirements shall be met during controlled diversions:

- Effluent from the sewage treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion does not include blending as defined in s. NR 210.03(2e), Wis. Adm. Code, and as may only be approved under s. NR 210.12. A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in sewage treatment facility records and such records shall be available to the department on request.

### 5.2.9 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

### 5.2.10 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

## 5.3 Sewage Collection Systems

### 5.3.1 Sanitary Sewage Overflows and Sewage Treatment Facility Overflows

### 5.3.1.1 Overflows Prohibited

Any overflow or discharge of wastewater from the sewage collection system or at the sewage treatment facility, other than from permitted outfalls, is prohibited. The permittee shall provide information on whether any of the following conditions existed when an overflow occurred:

- The sanitary sewer overflow or sewage treatment facility overflow was unavoidable to prevent loss of life, personal injury or severe property damage;
- There were no feasible alternatives to the sanitary sewer overflow or sewage treatment facility overflow such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or preventative maintenance activities;
- The sanitary sewer overflow or the sewage treatment facility overflow was caused by unusual or severe weather related conditions such as large or successive precipitation events, snowmelt, saturated soil conditions, or severe weather occurring in the area served by the sewage collection system or sewage treatment facility; and
- The sanitary sewer overflow or the sewage treatment facility overflow was unintentional, temporary, and caused by an accident or other factors beyond the reasonable control of the permittee.

### 5.3.1.2 Permittee Response to Overflows

Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions, including those in NR 210.21 (3), Wis. Adm. Code, shall be implemented consistent with an emergency response plan developed under the CMOM program.

### 5.3.1.3 Permittee Reporting

Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

- The permittee shall notify the department by telephone, fax or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow;
- The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:

  ◦The date and location of the overflow;
  ◦The surface water to which the discharge occurred, if any;
  ◦The duration of the overflow and an estimate of the volume of the overflow;
  ◦A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe;
  ◦The estimated date and time when the overflow began and stopped or will be stopped;
  ◦The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture and other relevant information;
  ◦Steps taken or planned to reduce, eliminate and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
  ◦A description of the actual or potential for human exposure and contact with the wastewater from the overflow;
  ◦Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps;
  ◦To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred

concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow; and
◦The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

**NOTE**: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at http://dnr.wi.gov/topic/wastewater/SSOreport.html. As indicated on the form, additional information may be submitted to supplement the information required by the form.

- The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences; and
- A permittee that is required to submit wastewater discharge monitoring reports under NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

#### 5.3.1.4 Public Notification

The permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under the CMOM (Capacity, Management, Operation and Maintenance) section of this permit and s. NR 210.23 (4) (f), Wis. Adm. Code. Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

### 5.3.2 Capacity, Management, Operation and Maintenance (CMOM) Program

- The permittee shall have written documentation of the Capacity, Management, Operation and Maintenance (CMOM) program components in accordance with s. NR 210.23(4), Wis. Adm. Code. Such documentation shall be available for Department review upon request. The Department may request that the permittee provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of the WPDES permit.
- The permittee shall implement a CMOM program in accordance with s. NR 210.23, Wis. Adm. Code.
- The permittee shall at least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the general standards of s. NR 210.23(3), Wis. Adm. Code.

### 5.3.3 Sewer Cleaning Debris and Materials

All debris and material removed from cleaning sanitary sewers shall be managed to prevent nuisances, run-off, ground infiltration or prohibited discharges.

- Debris and solid waste shall be dewatered, dried and then disposed of at a licensed solid waste facility.
- Liquid waste from the cleaning and dewatering operations shall be collected and disposed of at a permitted wastewater treatment facility.

- Combination waste including liquid waste along with debris and solid waste may be disposed of at a licensed solid waste facility or wastewater treatment facility willing to accept the waste.

## 5.4 Surface Water Requirements

### 5.4.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

### 5.4.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

**Weekly/Monthly/Six-Month/Annual Average Concentration** = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

**Weekly Average Mass Discharge (lbs/day):** Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

**Monthly Average Mass Discharge (lbs/day):** Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

**Six-Month Average Mass Discharge (lbs/day):** Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

**Annual Average Mass Discharge (lbs/day):** Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

**Total Monthly Discharge:** = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

**Total Annual Discharge:** = sum of total monthly discharges for the calendar year.

**12-Month Rolling Sum of Total Monthly Discharge:** = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

### 5.4.3 Effluent Temperature Requirements

**Weekly Average Temperature –** The permittee shall use the following formula for calculating effluent results to determine compliance with the weekly average temperature limit (as applicable): Weekly Average Temperature = the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

**Cold Shock Standard –** Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

**Rate of Temperature Change Standard –** Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state.

### 5.4.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

### 5.4.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

### 5.4.6 Percent Removal

During any 30 consecutive days, the average effluent concentrations of $BOD_5$ and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

### 5.4.7 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

### 5.4.8 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;

- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

(a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)

(b) Identify the compound(s) causing toxicity

(c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)

(d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;

- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

### 5.4.9 Reopener Clause

Pursuant to s. 283.15(11), Wis. Stat. and 40 CFR 131.20, the Department may modify or revoke and reissue this permit if, through the triennial standard review process, the Department determines that the terms and conditions of this permit need to be updated to reflect the highest attainable condition of the receiving water.

### 5.4.10 Whole Effluent Toxicity (WET) and Chloride Source Reduction Measures

Section NR 106.89, Wis. Adm. Code, states that chloride limitations can be used in the permit in lieu of whole effluent toxicity testing requirements and limitations until chloride source reduction actions are completed, under the following conditions.

When an acute chloride limitation is included in the permit, acute whole effluent toxicity testing and limitations may be discontinued until chloride source reduction actions are completed, according to s. NR 106.89, Wis. Adm. Code, if either:

- The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride exceeds 2,500 mg/l, or
- The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride is less than 2,500 mg/l, but in excess of the calculated acute water quality-based effluent limitation, and additional data are submitted which demonstrate that chloride is the sole source of acute toxicity.

When a chronic chloride limitation is included in the permit, chronic whole effluent toxicity testing and limitations may be discontinued until chloride source reduction actions are completed, according to s. NR 106.89, Wis. Adm. Code, if either:

- The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride exceeds 2 times the calculated chronic water quality-based effluent limitation, or
- The permittee can demonstrate to the satisfaction of the department that the effluent concentration of chloride is less than 2 times the calculated chronic water quality-based effluent limitation, but in excess of the calculated chronic water quality-based effluent limitation, and additional data are submitted which demonstrate that chloride is the sole source of chronic toxicity.

Following the completion of chloride source reduction activities, the department shall evaluate the need for whole effluent toxicity monitoring and limitation.

## 5.5 Land Application Requirements

### 5.5.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

### 5.5.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

### 5.5.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

### 5.5.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report. The Characteristic Report Form 3400-49 shall be submitted electronically by January 31 following each year of analysis.

Following submittal of the electronic Characteristic Report Form 3400-49, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report is true, accurate and complete. The Lab Report must be sent directly to the facility's DNR sludge representative or basin engineer unless approval for not submitting the lab reports has been given.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

### 5.5.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

### 5.5.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined as follows.

Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code.

- EPA Method 1668 may be used to test for all PCB congeners. If this method is employed, all PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported. **Note**: It is recognized that a number of the congeners will co-elute with others, so there will not be 209 results to sum.
- EPA Method 8082A shall be used for PCB-Aroclor analysis and may be used for congener specific analysis as well. If congener specific analysis is performed using Method 8082A, the list of congeners tested shall include at least congener numbers 5, 18, 31, 44, 52, 66, 87, 101, 110, 138, 141, 151, 153, 170, 180, 183, 187, and 206 plus any other additional congeners which might be reasonably expected to occur in the particular sample. For either type of analysis, the sample shall be extracted using the Soxhlet extraction (EPA Method 3540C) (or the Soxhlet Dean-Stark modification) or the pressurized fluid extraction (EPA Method 3545A). If Aroclor analysis is performed using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.11 mg/kg as possible. Reporting protocol, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If congener specific analysis is done using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.003 mg/kg as possible for each congener. If the aforementioned limits of detection cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference. The lab conducting the analysis shall perform as many of the following methods as necessary to remove interference:

| | |
|---|---|
| 3620C – Florisil | 3611B - Alumina |
| 3640A - Gel Permeation | 3660B - Sulfur Clean Up (using copper shot instead of powder) |
| 3630C - Silica Gel | 3665A - Sulfuric Acid Clean Up |

## 5.5.7 Annual Land Application Report

Land Application Report Form 3400-55 shall be submitted electronically by January 31, each year whether or not non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

## 5.5.8 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied. Following submittal of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

## 5.5.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

## 5.5.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

## 5.5.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

## 5.5.12 Class B Sludge: Fecal Coliform Limitation

Compliance with the fecal coliform limitation for Class B sludge shall be demonstrated by calculating the geometric mean of at least 7 separate samples. (Note that a Total Solids analysis must be done on each sample). The geometric mean shall be less than 2,000,000 MPN or CFU/g TS. Calculation of the geometric mean can be done using one of the following 2 methods.

Method 1:

Geometric Mean = $(X_1 \times X_2 \times X_3 \ldots \times X_n)^{1/n}$

Where X = Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Method 2:

Geometric Mean = $\text{antilog}[(X_1 + X_2 + X_3 \ldots + X_n) \div n]$

Where X = $\log_{10}$ of Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Example for Method 2

| Sample Number | Coliform Density of Sludge Sample | $\log_{10}$ |
|---|---|---|
| 1 | $6.0 \times 10^5$ | 5.78 |
| 2 | $4.2 \times 10^6$ | 6.62 |
| 3 | $1.6 \times 10^6$ | 6.20 |
| 4 | $9.0 \times 10^5$ | 5.95 |
| 5 | $4.0 \times 10^5$ | 5.60 |
| 6 | $1.0 \times 10^6$ | 6.00 |
| 7 | $5.1 \times 10^5$ | 5.71 |

The geometric mean for the seven samples is determined by averaging the $\log_{10}$ values of the coliform density and taking the antilog of that value.

$(5.78 + 6.62 + 6.20 + 5.95 + 5.60 + 6.00 + 5.71) \div 7 = 5.98$

The antilog of $5.98 = 9.5 \times 10^5$

## 5.5.13 Vector Control: Specific Oxygen Uptake Rate

The specific oxygen uptake rate (SOUR) for aerobic sludge shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids on a dry weight basis, corrected to 20° Celsius. See Municipal Wastewater Sludge Guidance Memo #2 (Guidance Notes for Specific Oxygen Uptake Rates on Aerobically Digested Sludge).

# 6 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

| Description | Date | Page |
|---|---|---|
| Adaptive Management Interim Limit Compliance Update -Progress Report | March 31, 2021 | 13 |
| Adaptive Management Interim Limit Compliance Update -Comply with Adaptive Management Interim Limit | October 31, 2021 | 13 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report | January 31, 2021 | 13 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #2 | January 31, 2022 | 13 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #3 | January 31, 2023 | 13 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #4 | January 31, 2024 | 13 |
| Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance | March 31, 2024 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 1st Permit Term | January 31, 2025 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #5 | January 31, 2026 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #6 | January 31, 2027 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #7 | January 31, 2028 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #8 | January 31, 2029 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance | March 31, 2030 | 14 |
| Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report for 2nd Permit Term | January 31, 2030 | 15 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #9 | January 31, 2031 | 15 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #10 | January 31, 2032 | 15 |
| Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #11 | January 31, 2033 | 15 |
| Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report | January 31, 2034 | 15 |
| Watershed Adaptive Management Option Annual Report Submittals - | September 30, 2034 | 15 |

| | | |
|---|---|---|
| Achieve Water Quality Standards and Adaptive Management Plan Success | | |
| Chloride Target Value -Annual Chloride Progress Report | January 31, 2021 | 15 |
| Chloride Target Value -Annual Chloride Progress Report #2 | January 31, 2022 | 16 |
| Chloride Target Value -Annual Chloride Progress Report #3 | January 31, 2023 | 16 |
| Chloride Target Value -Annual Chloride Progress Report #4 | January 31, 2024 | 16 |
| Chloride Target Value -Final Chloride Report | January 31, 2025 | 16 |
| Chloride Target Value -Annual Chloride Reports After Permit Expiration | See Permit | 16 |
| Compliance Maintenance Annual Reports (CMAR) | by June 30, each year | 18 |
| General Sludge Management Form 3400-48 | prior to any significant sludge management changes | 27 |
| Characteristic Form 3400-49 and Lab Report | by January 31 following each year of analysis | 27 |
| Land Application Report Form 3400-55 | by January 31, each year whether or not non-exceptional quality sludge is land applied | 28 |
| Other Methods of Disposal or Distribution Report Form 3400-52 | by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied | 28 |
| Wastewater Discharge Monitoring Report | no later than the date indicated on the form | 17 |

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non-industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
South Central Reg - Dodgeville, 1500 N. Johns Street, Dodgeville, WI 53533-2116

# Permit Fact Sheet

## General Information

| | | |
|---|---|---|
| Permit Number: | WI-0022217-10-1 Permit Modification | |
| Permittee Name: | CITY OF CUBA CITY | |
| Address: | 108 North Main Street | |
| City/State/Zip: | Cuba City WI 53807 | |
| Discharge Location: | A ditch tributary to Coon Branch, approx. 600 feet southeast of the WWTF. | |
| Receiving Water: | Tributary to Coon Branch | |
| Stream Flow ($Q_{7,10}$): | 0.12 cfs | |
| Stream Classification: | Limited Aquatic Life (LAL) at the point of discharge to the confluence with Coon Branch. Limited forage fishery (LFF) from the confluence of the tributary downstream to Hwy 11 bridge. Warm Water Sport Fishery (WWSF) downstream of Hwy 11 bridge. | |
| Design Flow(s) | Daily Maximum | 0.75 MGD |
| | Monthly Maximum | 0.435 MGD |
| | Annual Average | 0.30 MGD |
| Significant Industrial Loading? | Weber Meat Processing Plant | |
| Operator at Proper Grade? | Facility is Basic with subclasses A1 – Suspended Growth Processes, B – Solids Separation, C – Biological Solids/Sludges, L – Laboratory, SS – Sanitary Sewage Collection System. Three operators are certified. | |
| Approved Pretreatment Program? | N/A | |

## Facility Description

The City of Cuba City operates a wastewater treatment facility that serves a population of approximately 2000 residents and one industrial contributor. Treatment consists of preliminary screening, activated sludge (oxidation ditch), automatic dissolved oxygen control, final clarification followed by post-aeration prior to discharge to a tributary to Coon Branch. The facility has a design flow of 0.3 MGD and currently treats an average of 0.162 MGD. Sludge that is produced is aerobically digested and stored on-site prior to land application on Department approved sites.

Permit modification completed to correct rounding error in the WET testing 'Determination of Positive Result' section of the permit. The original permit had incorrectly listed the Toxic Unit – Chronic (TUc) as 1.54. The correct TUc to determine a positive result is 1.5.

| **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 | 0.198 MGD | Representative influent samples shall be collected after screening. |

| Sample Point Designation | | |
|---|---|---|
| **Sample Point Number** | **Discharge Flow, Units, and Averaging Period** | **Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable)** |
| | (July 2014 – July 2019 Average) | |
| 001 | 0.162 MGD<br>(July 2014 – July 2019 Average) | Representative effluent samples shall be collected at the chlorine contact tank, prior to discharge to the Coon Branch. |
| 003 | 20 Dry US Tons<br>(2019 Permit Application) | Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sludge storage tanks. |
| 601 | New Sample Point | Representative water samples and flow shall be collected from Coon Branch. Sample point 601 is located downstream of the Cuba City WWTF outfall, where Coon Branch meets Roaster Road (42.59473 N/90.41224 W). Sample point 601 correlates with the sample point described in the approved AM Plan No. WQT-2019-0001. |

# 1 Influent - Proposed Monitoring

## Sample Point Number: 701- INFLUENT

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

## Changes from Previous Permit:

None.

## Explanation of Limits and Monitoring Requirements

**BOD5 and Total Suspended Solids:** These are standard municipal wastewater requirements. Tracking of BOD5, and Suspended Solids are required for percent removal requirements.

# 2 Surface Water - Proposed Monitoring and Limitations

## Sample Point Number: 001- EFFLUENT

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | MGD | Continuous | 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 | 3/Week | Grab | |
| pH Field | Daily Min | 6.0 su | 3/Week | Grab | |
| Dissolved Oxygen | Daily Min | 4.0 mg/L | 3/Week | Grab | |
| Nitrogen, Ammonia (NH3-N) Total | Daily Max | 15 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 10 mg/L | 3/Week | 24-Hr Flow Prop Comp | April 1 through April 30 |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 4.7 mg/L | 3/Week | 24-Hr Flow Prop Comp | May 1 through September 30 |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 16 mg/L | 3/Week | 24-Hr Flow Prop Comp | October 1 through March 31 |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 4.5 mg/L | 3/Week | 24-Hr Flow Prop Comp | April 1 through April 30 |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 2.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | May 1 through September 30 |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 6.9 mg/L | 3/Week | 24-Hr Flow Prop Comp | October 1 through March 31 |
| Phosphorus, Total | Monthly Avg | 1.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | This is an interim limit, effective immediately. |
| Phosphorus, Total | 6-Month Avg | 0.6 mg/L | 3/Week | 24-Hr Flow Prop Comp | This is the Adaptive Management interim limit that will go into effect May 1, 2021. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 5.1 of the |

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| | | | | | permit. |
| Phosphorus, Total | | lbs/day | 3/Week | Calculated | Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs. Daily mass (lbs/day) = daily concentration (mg/L) x daily flow (MGD) x 8.34. |
| Nitrogen, Total Kjeldahl | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. |
| Nitrogen, Total | | mg/L | See Listed Qtr(s) | Calculated | Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |
| Chloride | Monthly Avg | 450 mg/L | 4/Month | 24-Hr Flow Prop Comp | This is an interim limit. Sampling shall be done on four consecutive days one week per month. See Chloride Variance section below and the Schedules section for applicable target value. |
| Chloride | | lbs/day | 4/Month | Calculated | Sampling shall be done on four consecutive days one week per month. See Chloride Variance section below and the Schedules section for applicable target value. |
| Chronic WET | | TUc | See Listed Qtr(s) | 24-Hr Flow Prop Comp | See WET section below for monitoring dates. |

## Changes from Previous Permit

Daily maximum Ammonia Nitrogen limits are now 15 mg/L for the whole year. The Adaptive Management (AM) interim limit of 0.6 mg/L as a six-month average has been added because the facility is pursing AM as part of phosphorus compliance. The interim chloride limit has been lowered from 520 mg/L to 450 mg/L as part of the reapplication for a chloride variance. Temperature monitoring has been removed for this permit term.

**Total Nitrogen Monitoring (TKN, N02+N03 and Total N):** Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

## Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limits memo prepared by Sarah Luck, dated September 13, 2019, for the detailed calculations and explanations.

> Note: Throughout this fact sheet all citations of administrative code for example, s. NR 102.06, Wis. Adm. Code, will be referenced as s. NR 102.06, and reflect current Wisconsin Administrative Code.

**Categorical Limits**

**$BOD_5$, pH, Total Suspended Solids, & Dissolved Oxygen –** Standard municipal wastewater requirements for $BOD_5$, pH, Total Suspended Solids, and Dissolved Oxygen are included based on NR 210 'Sewage Treatment Works' requirements for discharges to limited aquatic life streams. Chapter NR 102 'Water Quality Standards for Surface Waters' also specifies requirements for pH for fish and aquatic life streams.

**Water Quality Based Limits and WET Requirements and Disinfection (if applicable)**

**Phosphorus** – The proposed permit will be Cuba City's second permit term under new administrative rules for phosphorus discharges that took effect December 1, 2010. Details regarding the administrative rules for phosphorus discharges may be found at: http://dnr.wi.gov/topic/surfacewater/phosphorus.html. The new phosphorus rules are contained in s. NR 102.06 and ch. NR 217, Subchapter III.

Adaptive Management – The City of Cuba City has requested, and the Department has approved a plan to implement a watershed adaptive management approach under s. NR 217.18, as a means for Cuba City to achieve compliance with the phosphorus water quality standard in s. NR 102.06. The phosphorus limitations and conditions in this permit reflect the approved adaptive management (AM) plan WQT-2019-0001. The permittee shall design and implement the actions identified in AM Plan No. WQT-2019-0001 in accordance with the goals and measures identified. The goal of the AM plan is to reduce phosphorus loadings within the Cuba City action area by at a minimum 280 lbs/yr by the end of this permit term (September 31, 2025). In addition, annual progress reports are required. See Schedules section for more details.

The Department may terminate the AM option based on the reasons enumerated in NR 217.18(3)(e)2.
The permit contains an interim adaptive management phosphorus limit of 0.6 mg/L. The averaging periods for the six-month average limit are May through October and November through April. Compliance with the 0.6 mg/L six-month interim limit is evaluated at the end of each six-month period on April 30 and October 31 annually. There is also a 1.0 mg/L monthly average phosphorus limit in effect for the duration of the reissued permit.

Surface water monitoring requirements are also included in the proposed permit in support of the goals and measures of the adaptive management plan and are discussed in more detail in following subsections of this fact sheet.

**Nitrogen, Ammonia –** Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality-based effluent limitations (WQBELs) for ammonia.

**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 §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected

during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Annual tests are scheduled in the following rotating quarters: **October – December 2020; January – March 2021; April – June 2022; July – September 2023; October – December 2024; January – March 2025.**

**Chloride** – The 1-day P99 effluent concentrations for chloride were below the applicable acute limitation, so a daily maximum limit is not required. The calculated 4-day P99 is above the applicable chronic limitation of 400 mg/L, so a chronic (weekly average) limit needs to be continued for the reissued permit. However, the permittee has re-applied for a variance from the chronic chloride water quality criterion, which requires EPA approval. An interim limit of 450 mg/L is included. As a condition of this variance the implementation of chloride source reduction measures, intended to lead to compliance with the target value by the end of the permit term, are also included in the proposed permit. See the schedules section for the chloride compliance schedule. 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 IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride.

**Chloride Source Reduction Measures**

- City public works employees to attend training seminars and educational programs to raise awareness on chlorides reduction.
- Present an annual update to City's public officials on the progress made in reducing chlorides and educate them on why further reductions are needed.
- Mail water softener information brochure with sewer bill. The information focuses on timer vs. on-demand systems and how to optimize each type of softener.
- Post the water softener informational brochure on the City website.
- Provide training to Public Works staff regarding the optimization of road salt.
- Conduct an open house at the sewer plant (tour and educational sessions).
- Work with local plumbers to establish a rebate or incentive program to assist in funding replacement of timer-based softeners in the City.
- Track the program incentives on an annual basis to record the location and number of new on-demand systems installed.
- Develop and implement a City ordinance to offer a rebate for water softener optimization, inspection, and/or replacement.
- Survey residents on water softening equipment and practices. This will be conducted as part of the free inspections offered by local plumbers.
- Meet with all industrial/commercial water uses and document visits; look at their softening equipment with trained professionals.
- Continue tracking and recording the monthly effluent concentration data at the WWTF.
- Continue the rehabilitation of sanitary manholes and record this information as part of the City's CMOM program.
- Investigate the calibration of water softeners at all public buildings.

**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)

## Sample Point Number: 601- In-Stream Sampling Point 601

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Flow Rate | | cfs | 1/ 2 Weeks | Measure | Provide a measurement of river flow for each day that in-stream phosphorus monitoring is performed. |
| Phosphorus, Total | | mg/L | 1/ 2 Weeks | Grab | |
| Phosphorus, Total | | lbs/month | Monthly | Total Monthly | See section 3.2.2.3 below or Standard Requirement 6.4.2 for calculation of monthly loads. |

### Changes from Previous Permit

Downstream surface water monitoring was not required during the previous permit term. Monitoring is included as part of the adaptive management requirements.

### Explanation of Limits and Monitoring Requirements

As part of the Adaptive Management plan requirements, downstream monitoring of Coon Branch for river flow rate, in-stream phosphorus concentration and total monthly in-stream phosphorus loads. The in-stream phosphorus concentration and river flow rate are used to calculate the total monthly loading of phosphorus in Coon Branch on a monthly basis. This monitoring will allow Cuba City to demonstrate reductions in phosphorus loading for each month of the year.

# 3 Land Application - Proposed Monitoring and Limitations

| Municipal Sludge Description | | | | | | |
|---|---|---|---|---|---|---|
| **Sample Point** | **Sludge Class (A or B)** | **Sludge Type (Liquid or Cake)** | **Pathogen Reduction Method** | **Vector Attraction Method** | **Reuse Option** | **Amount Reused/Disposed (Dry Tons/Year)** |
| 003 | B | Liquid | Fecal Coliform | Aerobic SOUR Test | Land Application | 20 |
| 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**<br>If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in land applying sludge from this facility | | | | | | |
| Is a priority pollutant scan required? **No**, design flow is less than 5 MGD (0.3 MGD).<br>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. | | | | | | |

## Sample Point Number: 003- SLUDGE

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Jan. 1, 2022 - Dec. 31, 2022. |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Jan. 1, 2022 - Dec. 31, 2022. |
| Solids, Total | | Percent | Annual | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Annual | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Annual | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Annual | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Annual | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Annual | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Annual | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Annual | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Annual | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Annual | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Annual | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Annual | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Annual | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Annual | Composite | |
| Nitrogen, Ammonium (NH4-N) Total | | Percent | Annual | Composite | |
| Phosphorus, Total | | Percent | Annual | Composite | |
| Phosphorus, Water Extractable | | % of Tot P | Annual | Composite | |
| Potassium, Total Recoverable | | Percent | Annual | Composite | |

## Changes from Previous Permit:

New timeframe for monitoring PCBs is now calendar year 2022.

## Explanation of Limits and Monitoring Requirements

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

**Water Extractable Phosphorus –** Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

# 4 Schedules

## 4.1 Adaptive Management Interim Limit Compliance Update

| Required Action | Due Date |
|---|---|
| **Progress Report**: Submit the first progress report on the ability of the wastewater treatment facility to consistently meet the Adaptive Management interim effluent limit of 0.6 mg/L as a six-month seasonal average with averaging periods of May through October and November through April. | 03/31/2021 |
| **Comply with Adaptive Management Interim Limit**: The Adaptive Management interim effluent limit of 0.6 mg/L as a six-month seasonal average goes into effect. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30 and October 31 annually. | 10/31/2021 |

### 4.1.1 Explanation of Adaptive Management Limit Compliance Update

This compliance schedule provides the Permittee until October 31, 2021 to comply with the phosphorus adaptive management limit of 0.6 mg/L. Annual progress reports on the facility's ability to meet the interim limit are required for the first year of the permit.

## 4.2 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM Plan No. WQT-2019-0003 (February 2019).

| Required Action | Due Date |
|---|---|
| **Annual Adaptive Management Report**: Submit an annual adaptive management progress report. The annual adaptive management progress report shall:<br>- Identify those actions from section 4 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress;<br>- Evaluate collected monitoring data;<br>- Document progress in achieving the goals and measures identified in the approved adaptive | 01/31/2021 |

| | |
|---|---|
| management plan;<br>- Describe the outreach and education efforts that occurred during the past calendar year;<br>- Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code;<br>and<br>- Describe any updates needed to Cuba City's approved phosphorus optimization plan. | |
| **Annual Adaptive Management Report #2**: Submit an adaptive management progress report as defined above. | 01/31/2022 |
| **Annual Adaptive Management Report #3**: Submit an adaptive management progress report as defined above. | 01/31/2023 |
| **Annual Adaptive Management Report #4**: Submit an adaptive management progress report as defined above. | 01/31/2024 |
| **Renewal of Adaptive Management Plan for Permit Reissuance:** If the permittee intends to seek renewal of AM plan No. WQT-2019-0003 (February 2019) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan no. WQT-2019-0003 (February 2019) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area. | 03/31/2024 |
| **Final Adaptive Management Report for 1st Permit Term**: Submit the final adaptive management report documenting the success in meeting the watershed phosphorus reduction target of 280 lbs, as well as the anticipated future reduction in phosphorus sources and phosphorus effluent concentrations. The report shall summarize adaptive management activities that have been implemented during the current permit term and state which, if any, actions from the approved adaptive management plan WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends in effluent and in-stream monthly and six-month average phosphorus concentrations and total mass of phosphorus based on phosphorus sampling and flow data of effluent and in Coon Branch during the current permit term. The report shall also include an analysis of how effluent phosphorus varies with time and with significant loadings of phosphorus such as loads from large storm events.<br>Additionally, the report shall include proposed adaptive management goals and actions for negotiations with the department if the permittee intends to seek a renewed adaptive management plan per s. NR 217.18, Wis. Adm. Code, for the reissued permit. | 01/31/2025 |
| **Annual Adaptive Management Report #5:** Submit an adaptive management progress report as defined above. | 01/31/2026 |
| **Annual Adaptive Management Report #6:** Submit an adaptive management progress report as defined above. | 01/31/2027 |
| **Annual Adaptive Management Report #7:** Submit an adaptive management progress report as defined above. | 01/31/2028 |
| **Annual Adaptive Management Report #8:** Submit an adaptive management progress report as | 01/31/2029 |

| | |
|---|---|
| defined above. | |
| **Renewal of Adaptive Management Plan for Permit Reissuance:** If the permittee intends to seek renewal of AM plan No. WQT-2019-0003 (February 2019) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan no. WQT-2019-0003 (February 2019) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area. | 03/31/2030 |
| **Final Adaptive Management Report for 2nd Permit Term**: Submit the final adaptive management report documenting the success in meeting the watershed phosphorus reduction target of 2250 lbs, as well as the anticipated future reduction in phosphorus sources and phosphorus effluent concentrations. The report shall summarize adaptive management activities that have been implemented during the current permit term and state which, if any, actions from the approved adaptive management plan WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends in effluent and in-stream monthly and six-month average phosphorus concentrations and total mass of phosphorus based on phosphorus sampling and flow data of effluent and in Coon Branch during the current permit term. The report shall also include an analysis of how effluent phosphorus varies with time and with significant loadings of phosphorus such as loads from large storm events.<br><br>Additionally, the report shall include proposed adaptive management goals and actions for negotiations with the department if the permittee intends to seek a renewed adaptive management plan per s. NR 217.18, Wis. Adm. Code, for the reissued permit. | 01/31/2030 |
| **Annual Adaptive Management Report #9:** Submit an adaptive management progress report as defined above. | 01/31/2031 |
| **Annual Adaptive Management Report #10:** Submit an adaptive management progress report as defined above. | 01/31/2032 |
| **Annual Adaptive Management Report #11:** Submit an adaptive management progress report as defined above. | 01/31/2033 |
| **Final Adaptive Management Report:** Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 2996 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2019-0003 (February 2019) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions. | 01/31/2034 |
| **Achieve Water Quality Standards and Adaptive Management Plan Success:** All the receiving waters identified with the AM plan, WQT-2019-0003 (February 2019), shall comply with water quality standards specified in s. NR 102.06, Wis. Adm. Code. Achieving water quality standards at identified monitoring stations means the AM plan was successful. The permittee shall continue to | 09/30/2034 |

| | |
|---|---|
| comply with applicable effluent limits (required under s.217.18(3)(3) expressed as a 6-month avg and continue monitoring surface waters at a minimum of monthly May through October for total phosphorus. | |

### 4.2.1 Explanation of Watershed Adaptive Management Option Annual Report Submittals

The above schedule requires Cuba City to submit annual adaptive management (AM) annual reports that show progress towards meeting the goals and measures contained in the approved AM plan. The final AM report must document the success of meeting the watershed phosphorus minimum reduction target of 1,400 pounds.

## 4.3 Chloride Target Value

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

| Required Action | Due Date |
|---|---|
| **Annual Chloride Progress Report:** Submit an annual chloride progress report. The annual chloride progress report shall:<br><br>Indicate which chloride source reduction measures or activities in the approved Source Reduction Plan have been implemented;<br><br>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and<br><br>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.<br><br>Note that the interim limitation of 450 mg/L remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due. | 01/31/2021 |
| **Annual Chloride Progress Report #2:** Submit the chloride progress report as defined above. | 01/31/2022 |
| **Annual Chloride Progress Report #3:** Submit the chloride progress report as defined above. | 01/31/2023 |
| **Annual Chloride Progress Report #4:** Submit the chloride progress report as defined above. | 01/31/2024 |
| **Final Chloride Report:** Submit the final chloride report documenting the success in meeting the chloride target value of 415 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Source Reduction Plan were not pursued and why. The report shall include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.<br><br>Additionally, the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit.<br><br>Note that the target value is the benchmark for evaluating the effectiveness of the chloride source | 01/31/2025 |

| | |
|---|---|
| reduction measures but is not an enforceable limitation under the terms of this permit. | |
| **Annual Chloride Reports After Permit Expiration:** In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends. | |

### 4.3.1 Explanation of Chloride Target Value Schedule

This schedule is a condition of receiving a variance from the chronic water quality-based chloride limit of 395 mg/L. Since a schedule is being granted, an interim limit is required, and for Cuba City the limit is established at 450 mg/L. The schedule requires that annual reports shall indicate which source reduction measures Cuba City has implemented during each year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 450 mg/L by the end of the permit term.

## Attachments:

Map(s)

Water Quality Based Effluent Limits

WET Checklist Summary

Public Notice

## Proposed Expiration Date:

A permit term of five years is proposed in this reissuance with an expiration date of September 30, 2025.

## Justification of Any Waivers from Permit Application Requirements

No waivers were requested from permit application requirements.

**Prepared By:**

Sean Spencer – Wastewater Specialist

**Date:** 4/29/2020

Modification Date: 9/14/2023 Jennifer Jerich, Wastewater Specialist

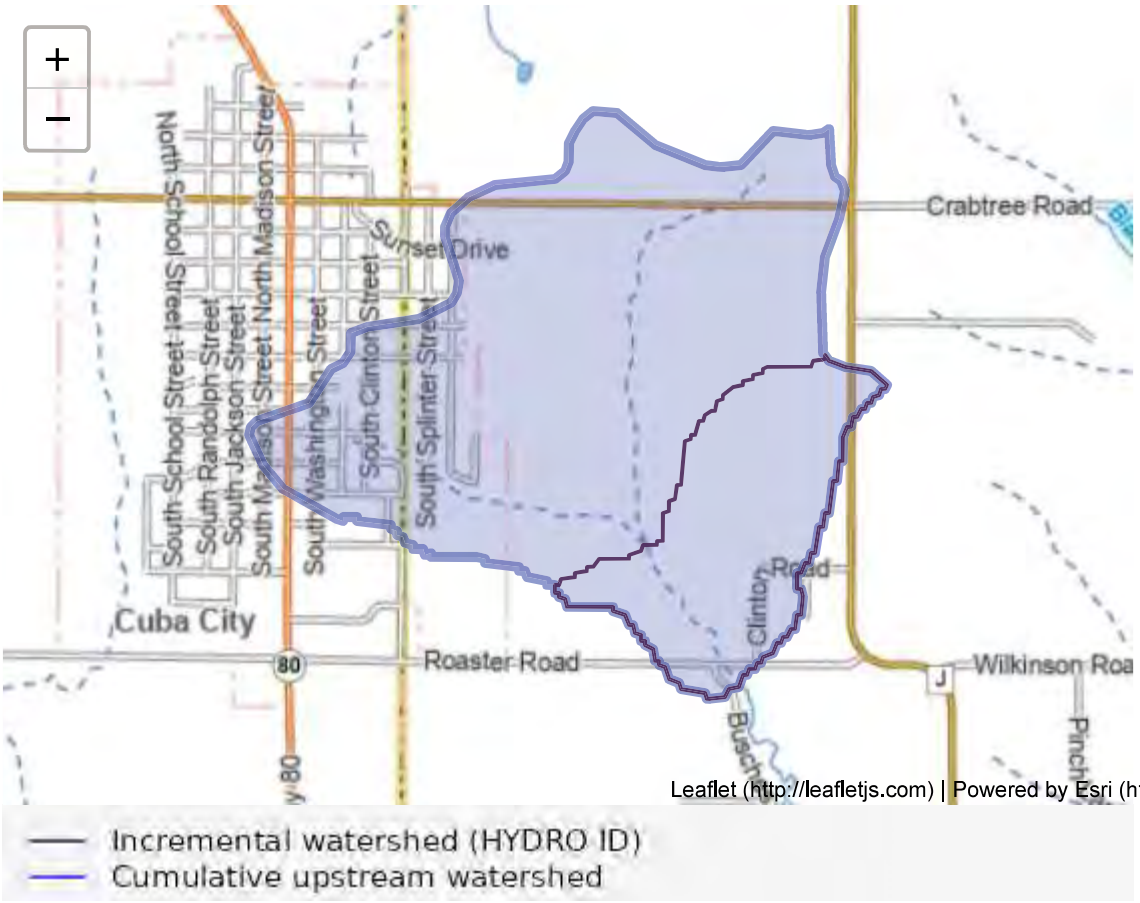
cc: Caitlin O'Connell

# Appendix C

# Watershed Data

**Wisconsin Department of Natural Resources**

# Select waterbody




Search:

## Reach information

Waterbody name: Coon Br
Waterbody type: Stream
Natural Community: Cool-Cold Headwater
Watershed size (sq mi; sq km): 1; 2.59
HYDROID: 200003983

HUC12: 070600050306
HUC12 Name: Kelsey Branch-Galena River
HUC6 Name: Upper Mississippi-Maquoketa-Plum
High-Quality Water: No
Ecoregion: Driftless Area
Sinuosity (m/m): 1.1
Minimum elevation (ft; m): 924.4; 281.7
Maximum elevation (ft; m): 940.5; 286.7
Average gradient (%): 0.77243
Stream order: 2
Dam directly above: Not Present
Drainage: Not internally drained

Download Watershed Shapefile (session/4a2c0c84759115ef1304b54caaec7b5a/download/download_watershed?w=2faa18cb492d49348c5616e388778882)
Download Raw Data (session/4a2c0c84759115ef1304b54caaec7b5a/download/download_raw_data?w=2faa18cb492d49348c5616e388778882)



# What Is Presto?

The Pollutant Load Ratio Estimation Tool (PRESTO) is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. The comparison provides a screening tool for industrial and municipal dischargers to determine one of the conditions of eligibility for adaptive management as part of s. NR 217.18, Wisconsin Administrative Code.

PRESTO was designed to be easily modified, transparent to the end user and provide a consistent result based on readily available datasets. PRESTO performs three basic functions: watershed delineation, nonpoint source loading estimation and point source loading aggregation. The PRESTO outputs include a delineated watershed, watershed land cover composition, the estimated average annual nonpoint source and measured point source phosphorus loads (pounds per year), and the ratio of point to nonpoint phosphorus at a watershed outlet.

# Presto Phosphorus Load Estimates

| | |
|---|---|
| Avg. Annual Nonpoint Phosphorous Load (80% Confidence Interval) | 4,899 (2,358 - 10,180) lbs |
| Number of Facilities (Individual Facility Information below) | 1 |
| Avg. Annual Point-source Phosphorous Load (2010 - 2012 total of all facilities) | 2,178 lbs |

| | |
|---|---|
| Most Likely Point : Nonpoint Phosphorous Ratio | 31% : 69% |
| Low Estimate Point : Nonpoint Phosphorous Ratio (Adaptive Management) | 18% : 82% |

# Adaptive Management Results

Facilities discharging to the Coon Br watershed:

Show 10 entries Search:

| | Facility Name | Permit No. | Outfall No. | Waste Type | Receiving Water | Annual load (lbs), 2010-2012 |
|---|---|---|---|---|---|---|
| 1 | CUBA CITY WASTEWATER TREATMENT FACILITY | 0022217 | 001 | Municipal | Coon Branch | 2178 |

Showing 1 to 1 of 1 entries Previous 1 Next

# Watershed Analysis Limitations

This analysis relies on pre-defined catchments from the Wisconsin Hydrography Data-Plus and may not delineate from the exact location required. When assessing phosphorus loads for specific facility in support of efforts such as adaptive management, care should be taken to ensure that additional downstream point sources do not exist. For adaptive management information related to specific facilities, please reference the PRESTO website: http://dnr.wi.gov/topic/surfacewater/presto.html.

Delineation of watersheds is based on a topographic assessment and therefore do not account for modified drainage networks such as stormwater sewer systems and ditched agriculture.

If a watershed requires delineation from an exact location, the user may use the desktop version of PRESTO that requires ESRI ArcGIS. The PRESTO tool and default datasets can be downloaded at http://dnr.wi.gov/topic/surfacewater/presto.html.

Data sources for this report originate from the DNR's Wisconsin Hydrography Data-Plus value-added dataset and the point and nonpoint source loading information including in the DNR's PRESTO model.

If you have questions about the report generated from the PRESTO-Lite application please contact: dnrwaterqualitymodeling@wisconsin.gov

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: December 2, 2022

TO: Sean Spencer – SCR/Fitchburg

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for the Benton Wastewater Treatment Facility
WPDES Permit No. WI-0020672-10-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Benton Wastewater Treatment Facility in Lafayette County. This municipal wastewater treatment facility (WWTF) discharges to the Galena (Fever) River, located in the Galena (Fever) River Watershed in the Grant-Platte 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 |
| $BOD_5$ | | | 45 mg/L | 30 mg/L | | 2 |
| TSS | | | 45 mg/L | 30 mg/L | | 2 |
| pH | 9.0 s.u. | 6.0 s.u. | | | | 2 |
| Ammonia Nitrogen | 14 mg/L | | 14 mg/L | 14 mg/L | | 2 |
| Bacteria | | | | | | 3 |
| Interim Limit Fecal Coliform | | | | 400 #/100 mL geometric mean | | |
| Final Limit *E. coli* | | | | 126 #/100 mL geometric mean | | |
| Chloride | | | | | | 2,4 |
| Phosphorus<br>LCA Interim Limit<br>HAC Interim Limit<br>Final WQBEL | | | | <br>1.0 mg/L<br>0.6 mg/L<br>0.225 mg/L | <br><br><br>0.075 mg/L<br>0.092 lb/day | 5 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | | 6 |

Footnotes:

1. Monitoring only.
2. No changes from the current permit.
3. 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.
4. Monitoring in the fourth year of the permit term at a frequency to ensure that a minimum of 11 samples are available at the next permit issuance.
5. If the facility applies and is approved for the phosphorus multi-discharger variance (MDV), a level currently achievable (LCA) interim limit of 1.0 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 0.6 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 of 0.092 lb/day.

6. 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. Total Nitrogen is the sum of nitrate ($NO_3$), nitrite ($NO_2$), and total kjeldahl nitrogen (TKN) (all expressed as N).

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

No PFOA or PFAS monitoring is required at this time, but the need for monitoring was evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code.

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

Attachments (3) – Narrative, Site Map, and Ammonia Nitrogen Calculations

PREPARED BY: Sarah Luck Date: December 2, 2022

Sarah Luck
Water Resources Engineer

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

Attachment #1

**Water Quality-Based Effluent Limitations for**
**Benton Wastewater Treatment Facility**

**WPDES Permit No. WI-0020672-10**

Prepared by: Sarah Luck

## PART 1 – BACKGROUND INFORMATION

### Facility Description

The Benton Wastewater Treatment Facility consists of preliminary treatment accomplished through a rotary fine screen, secondary treatment includes extended aeration activated sludge followed by a circular final clarifier, and seasonal ultraviolet disinfection. The facility was upgraded in 2020 to include chemical phosphorus removal (upgrades were fully functional in November 2020). The facility has an annual average design capacity of 0.147 MGD. Sludge is aerobically digested and stored prior to land spreading.

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, 2023, includes the following effluent limitations and monitoring requirements.

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Six-Month Average | Footnotes |
|---|---|---|---|---|---|---|
| Flow Rate | | | | | | 1 |
| $BOD_5$ | | | 45 mg/L | 30 mg/L | | 2 |
| TSS | | | 45 mg/L | 30 mg/L | | 2 |
| pH | 9.0 s.u. | 6.0 s.u. | | | | 2 |
| Ammonia Nitrogen | 14 mg/L | | **14 mg/L** | **14 mg/L** | | 3 |
| Fecal Coliform<br>May – September | | | **656#/100 mL**<br>(geometric mean) | 400#/100 mL<br>geometric mean | | 3 |
| Chloride | | | mg/L | | | 1 |
| Phosphorus<br>Interim<br>MDV Interim<br>Final | | | | <br>6.3 mg/L<br>1.0 mg/L<br>0.225 mg/L | <br><br><br>0.075 mg/L<br>0.092 lb/day | 4 |

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. Additional limits to comply with s. NR 106.07 are included in bold.
4. The facility was covered under the phosphorus MDV and had to meet the interim limit of 1.0 mg/L by March 31, 2022.

**Receiving Water Information**

- Name: Galena River, locally known as the Fever River
- Waterbody Identification Code (WBIC): 935500
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-$Q_{10}$ and 7-$Q_2$ values are from USGS for the Galena River at Highway 11, 1.1 miles east of Benton:
  7-$Q_{10}$ = 5.7 cfs (cubic feet per second)
  7-$Q_2$ = 12 cfs
  90-$Q_{10}$ = 10.2
  Harmonic Mean Flow = 20.2 cfs
- Hardness = 455 mg/L as $CaCO_3$. This value represents the geometric mean of 22 samples from the Galena River near Benton collected between 1998 and 2015.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from the Galena River are used for this evaluation (SWIMS Station #333230). The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: Hazel Green Wastewater Treatment Facility discharges approximately nine miles downstream, so the mixing zones do not overlap, and Hazel Green's discharge does not impact this evaluation.
- Impaired water status: The Galena (Fever) River is listed (4/1/2016) as impaired at the location of the discharge due to an unknown impairment causing degraded biological habitat.

**Effluent Information**

- Flow rate:
  Design annual average = 0.147 MGD (Million Gallons per Day)
  For reference, the actual average flow from April 2018 through September 2022 was 0.065 MGD.
- Hardness = 466 mg/L as $CaCO_3$. This value represents the geometric mean of data from September 2022 (n=5) reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.
- Additives: Alum (for phosphorus removal)
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables on the next page or in their respective parts in this evaluation.

Attachment #1

**Copper Effluent Data**

| Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) |
|---|---|---|---|---|---|
| 9/20/2022 | 3.7 | 10/2/2022 | 3.2 | 10/14/2022 | 3.9 |
| 9/23/2022 | 2.8 | 10/5/2022 | 3.9 | 10/17/2022 | 3.5 |
| 9/26/2022 | 2.9 | 10/8/2022 | 3.8 | 10/20/2022 | 4.0 |
| 9/29/2022 | 3.2 | 10/11/2022 | 4.0 | | |
| 1-day $P_{99}$ = 4.7 µg/L | | | | | |
| 4-day $P_{99}$ = 4.1 µg/L | | | | | |

**Chloride Effluent Data**

| Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) |
|---|---|---|---|---|---|
| 2/23/2021 | 450 | 6/16/2021 | 275 | 10/14/2021 | 285 |
| 3/18/2021 | 290 | 7/19/2021 | 355 | 11/9/2021 | 295 |
| 4/20/2021 | 340 | 8/11/2021 | 180 | 12/7/2021 | 280 |
| 5/19/2021 | 305 | 9/8/2021 | 215 | 1/4/2022 | 385 |
| 1-day $P_{99}$ = 510 mg/L | | | | | |
| 4-day $P_{99}$ = 398 mg/L | | | | | |

The following table presents the average concentrations and loadings at Outfall 001 from April 2018 through September 2022 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Averages of Parameters with Limits**

| | Average Measurement |
|---|---|
| $BOD_5$ | 6 mg/L* |
| TSS | 6 mg/L* |
| pH field | 7.6 s.u. |
| Phosphorus | 1.26 mg/L (0.79 mg/L since chemical upgrade) |
| Ammonia Nitrogen | 1.08 mg/L* |
| Fecal Coliform | 212#/100 mL |

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

## 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 99$^{th}$ percentile (or $P_{99}$) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

**Daily Maximum Limit Calculation Method**

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. In accordance with s. NR 106.06(3)(b), limitations based on acute toxicity are either set equal to two times the acute criteria (the final acute value) or calculated using the mass balance equation below, whichever is more restrictive.

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

Where:

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

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

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

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

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

In this case, limits set equal to two times the acute criteria are more restrictive and this method is used to calculate the daily maximum limits shown in the table below.

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

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

RECEIVING WATER FLOW = 4.56 cfs, (1-$Q_{10}$ (estimated as 80% of 7-$Q_{10}$)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

| SUBSTANCE | REF. HARD.* mg/L | ATC | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|
| Arsenic | | 340 | 680 | 136 | <0.85 | | |
| Cadmium | 457 | 58.9 | 117.8 | 23.6 | <0.19 | | |
| Chromium | 301 | 4446 | 8892 | 1778 | <1.1 | | |
| Copper | 466 | 66.3 | 132.5 | | | 4.7 | 4.0 |
| Lead | 356 | 365 | 729 | 146 | <4.3 | | |
| Nickel | 268 | 1080 | 2161 | 432 | 2.1 | | |
| Zinc | 333 | 345 | 689 | 138 | 30 | | |
| Chloride (mg/L) | | 757 | 1514 | | | 510 | 450 |

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

* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-$Q_{10}$ flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**

RECEIVING WATER FLOW = 1.43 cfs (¼ of the 7-$Q_{10}$), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

| SUBSTANCE | REF. HARD.* mg/L | CTC | MEAN BACK-GRD. | WEEKLY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 4-day $P_{99}$ |
|---|---|---|---|---|---|---|---|
| Arsenic | | 152.2 | 2.45 | 1090 | 218.1 | <0.85 | |
| Cadmium | 175 | 3.82 | 0.41 | 25.16 | 5.0 | <0.19 | |
| Chromium | 301 | 325.8 | 6.0 | 2329 | 465.8 | <1.1 | |
| Copper | 455 | 37.85 | 2.83 | 257.3 | | | 4.1 |
| Lead | 356 | 95.51 | | 693.9 | 138.8 | <4.3 | |
| Nickel | 268 | 120 | | 873 | 175 | 2.1 | |
| Zinc | 333 | 344.7 | | 2504 | 500.8 | 30 | |
| Chloride (mg/L) | | 395 | | 2870 | | | 398 |

* 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 = 5.05 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

| SUBSTANCE | HTC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. |
|---|---|---|---|---|---|
| Cadmium | 370 | 0.41 | 8576 | 1715.2 | <0.19 |
| Chromium (+3) | 3818000 | 6.0 | 88588245 | 17717649 | <1.1 |
| Lead | 140 | | 3248 | 649.7 | <4.3 |
| Nickel | 43000 | | 997721 | 199544 | 2.1 |

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW =5.05 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

| SUBSTANCE | HCC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. |
|---|---|---|---|---|---|
| Arsenic | 13.3 | 2.45 | 254.2 | 50.84 | <0.85 |

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

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, **no effluent limitations are required.**

Chloride – Considering available effluent data from the current permit term, the 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 Benton Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2019 through 2021 was 0.26 mg/kg (n=3 with two non-detects), with a maximum reported concentration of 0.78 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. Based on the annual design flow and lack of nondomestic contributors, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended**. If future sampling information of the effluent or source water indicates the presence of PFOS or PFOA, the monitoring requirements may change.

## 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.

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 432 sample results were reported from April 2018 through September 2022. The maximum reported value was 8.1 s.u. (Standard pH Units). The effluent pH was 8.0 s.u. or less 99% of the time. The 1-day $P_{99}$, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.1 s.u. Therefore, a value of 8.1 s.u. is believed to represent the maximum reasonably expected pH, and therefore

most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.1 s.u. into the equation above yields an ATC = 6.95 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 either set equal to two times the acute criteria (the final acute value) or calculated using the mass balance equation in s. NR 106.32(2)(e), Wis. Adm. Code.

In this case, limits set equal to two times the acute criteria are more restrictive. This method is used to calculate the daily maximum limit of **14 mg/L**.

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

**Daily Maximum Ammonia Nitrogen Limits – WWSF**

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

**Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)**
**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 #3.

**Effluent Data**
The following table evaluates the statistics based upon ammonia data reported from April 2018 through September 2022, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Benton Wastewater Treatment Facility. That need is determined by calculating 99$^{th}$ upper percentile (or $P_{99}$) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

**Ammonia Nitrogen Effluent Data**

| | Ammonia Nitrogen mg/L |
|---|---|
| 1-day $P_{99}$ | 12.0 |
| 4-day $P_{99}$ | 7.55 |

Attachment #1

| | Ammonia Nitrogen mg/L |
|---|---|
| 30-day $P_{99}$ | 3.14 |
| Mean* | 1.08 |
| Std | 3.48 |
| Sample size | 432 |
| Range | <0.05 - 21.24 |

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

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has daily maximum, weekly, and monthly limits year-round, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

**Conclusions and Recommendations**

In summary, after rounding to two significant figures, **the following ammonia nitrogen limitations are recommended; there are no changes from the previous permit.** 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 |
|---|---|---|
| 14 | 14 | 14 |

## 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. Since Benton Wastewater Treatment Facility's permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

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

**Interim Limit**
At this time, there is no effluent *E. coli* data available to determine if these limits are currently met. The permit will include a compliance schedule to meet these limits. During the compliance schedule, an interim limit applies to prevent back-sliding from the current level of disinfection during the compliance schedule period. Therefore, the current **fecal coliform limit shall be included in the reissued permit as an interim limit of 400 counts/100 mL as a monthly geometric mean**. The weekly geometric mean limit, which was included in the current permit for expression of limits purposes, does not need to be included in the permit as an interim limit.

## 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 Benton Wastewater Treatment Facility does not currently have an existing technology-based limit, the need for this limit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore **no technology-based limit is required**.

**Annual Average Mass Total Phosphorus Loading**

| Month | Average Phosphorus Concentration (mg/L) | Total Effluent Flow (Million Gallons) | Calculated Mass (lbs/month) |
|---|---|---|---|
| October 2021 | 0.951 | 2.08 | 17 |
| November 2021 | 0.686 | 1.94 | 11 |
| December 2021 | 0.530 | 1.58 | 7.0 |
| January 2022 | 0.695 | 1.28 | 7.4 |
| February 2022 | 0.704 | 1.19 | 7.0 |
| March 2022 | 0.844 | 1.59 | 11 |
| April 2022 | 0.680 | 1.77 | 10 |
| May 2022 | 1.671 | 1.53 | 21 |
| June 2022 | 0.876 | 1.36 | 9.9 |
| July 2022 | 0.614 | 1.70 | 8.7 |
| August 2022 | 0.621 | 1.69 | 8.8 |
| September 2022 | 0.774 | 1.33 | 8.6 |
| **Average** | | | **11** |

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MG) for that month

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

**Water Quality-Based Effluent Limits (WQBEL)**
Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for

surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

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

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

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

Where:

WQC = 0.075 mg/L for the Galena (Fever) River
Qs = 100% of the 7-$Q_2$ of 12 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.147 MGD = 0.227 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.178 mg/L based on available in stream total phosphorus data from the Galena River and its tributaries stored in the Surface Water Integrated Monitoring System. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance, however, no new data are available.

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. A chemical system was added to reduce phosphorus and became fully operational in November 2020. Therefore, data since then are considered to be most representative of current conditions, but the full dataset is also included in the table below for informational purposes.

**Total Phosphorus Effluent Data**

| | April 2018 – Sept 2022 (mg/L) | **After chemical upgrade** Nov 2020 – Sept 2022 (mg/L) |
|---|---|---|
| 1-day $P_{99}$ | 5.74 | 1.86 |
| 4-day $P_{99}$ | 3.18 | 1.25 |
| 30-day $P_{99}$ | 1.83 | 0.94 |
| Mean | 1.26 | 0.79 |

Attachment #1

| | April 2018 – Sept 2022 (mg/L) | **After chemical upgrade** Nov 2020 – Sept 2022 (mg/L) |
|---|---|---|
| Std | 1.16 | 0.33 |
| Sample size | 431 | 183 |
| Range | 0.09 - 7.53 | 0.36 - 2.86 |

**Reasonable Potential Determination**
**The effluent data demonstrate that the discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion** because the 30-day $P_{99}$ of reported effluent total phosphorus data is greater than the calculated WQBEL. Therefore, **a WQBEL is required.**

**Limit Expression**
According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 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 listed in ch. NR 102, Wis. Adm. Code, as an Exceptional Resource Water. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.147 MGD = 0.092 lb/day expressed as a six-month average.**

**Multi-Discharge Variance Interim Limit**
Benton Wastewater Treatment Facility was previously covered under the phosphorus multi-discharger variance (MDV). If they were to re-apply for the MDV, conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. **The recommended interim limit** during the second permit under MDV approval, pursuant to s. 283.16 (6) (a), Wis. Stats., **is 0.6 mg/L as a monthly average**. A compliance schedule may be appropriate to meet this interim limit, but compliance with 0.6 mg/L shall be no later than the end of the reissued permit. **The previous interim limit of 1.0 mg/L should not be exceeded during the compliance schedule.**

## PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

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

flow reported from April 2018 through September 2022.

The table below summarizes the maximum temperatures reported during monitoring from April 2011 through October 2012.

**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 | 46 | 46 | NA | 120 |
| FEB | 46 | 46 | NA | 120 |
| MAR | -- | -- | 120 | 120 |
| APR | 54 | 55 | NA | 120 |
| MAY | 61 | 61 | NA | 120 |
| JUN | 68 | 69 | NA | 120 |
| JUL | 75 | 75 | NA | 120 |
| AUG | 70 | 73 | NA | 120 |
| SEP | 70 | 70 | 114 | 120 |
| OCT | 63 | 64 | 88 | 120 |
| NOV | 56 | 57 | NA | 120 |
| DEC | 50 | 51 | NA | 120 |

At temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system. Therefore, there is no reasonable potential for the discharge to exceed this limit. **No monitoring or effluent limits are recommended for temperature.**

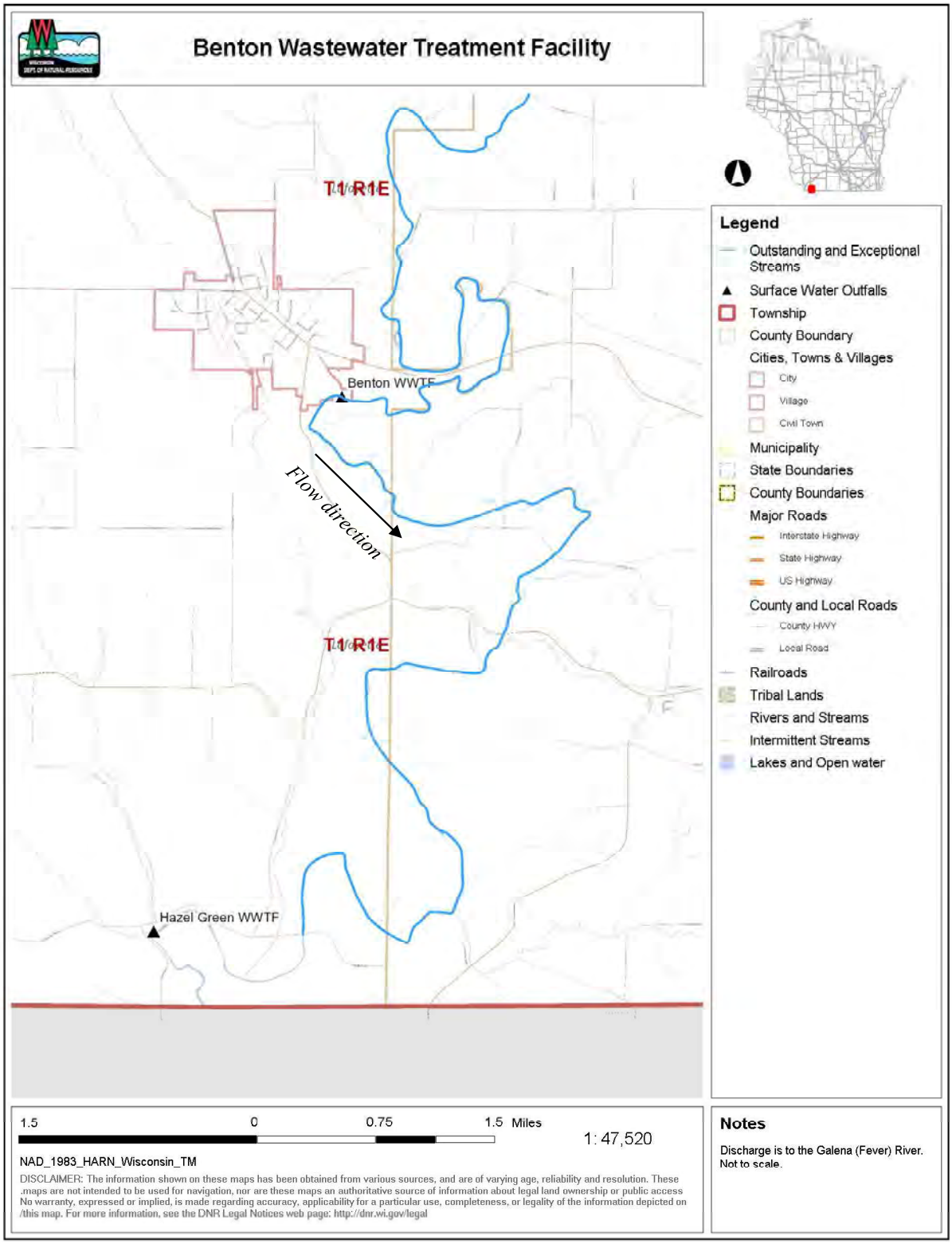
## PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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 (October 29, 2019).*

Guidance in Chapter 1.11 of the *WET Guidance Document (WET Testing of Minor Municipal Discharges)* was consulted. This is a minor municipal discharge (< 1.0 MGD) comprised solely of domestic wastewater, with no history of WET failures, and no toxic compounds detected at levels of concern. **No WET testing is recommended** at this time because of the low risk in effluent toxicity.

Attachment #2

**Site Map**



Attachment #3

**Ammonia Nitrogen Calculations from the WQBEL Memo Dated January 23, 2018**

| | | Spring | Summer | Winter |
|---|---|---|---|---|
| | | April & May | June – Sept. | Oct. - March |
| **Background Information** | 7-$Q_{10}$ (cfs) | 5.7 | 5.7 | 5.7 |
| | 7-$Q_2$ (cfs) | 12 | 12 | 12 |
| | Ammonia (mg/L) | 0.11 | 0.06 | 0.28 |
| | Temperature (°C) | 6 | 18.6 | 4 |
| | pH (s.u.) | 8.3 | 8.26 | 8.24 |
| | % of Flow used | 25 | 100 | 25 |
| | Reference Weekly Flow (cfs) | 1.43 | 5.70 | 1.43 |
| | Reference Monthly Flow (cfs) | 2.55 | 10.20 | 2.55 |
| **Criteria mg/L** | 4-day Chronic | | | |
| | Early Life Stages Present | 3.81 | 3.12 | |
| | Early Life Stages Absent | | | 6.82 |
| | 30-day Chronic | | | |
| | Early Life Stages Present | 1.52 | 1.25 | |
| | Early Life Stages Absent | | | 2.73 |
| **Effluent Limitations mg/L** | Weekly Average | | | |
| | Early Life Stages Present | 26.99 | 79.94 | |
| | Early Life Stages Absent | | | 47.83 |
| | Monthly Average | | | |
| | Early Life Stages Present | 17.38 | 54.62 | |
| | Early Life Stages Absent | | | 30.20 |

The rules provide a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the Galena River. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September.

**Expression of Limits**

The limits above are the calculated limits. However, revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works unless shown to be impracticable. Because a daily maximum ammonia limit was found to be necessary for Benton Wastewater Treatment Facility, weekly and monthly average limits are also required under this code revision.

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

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

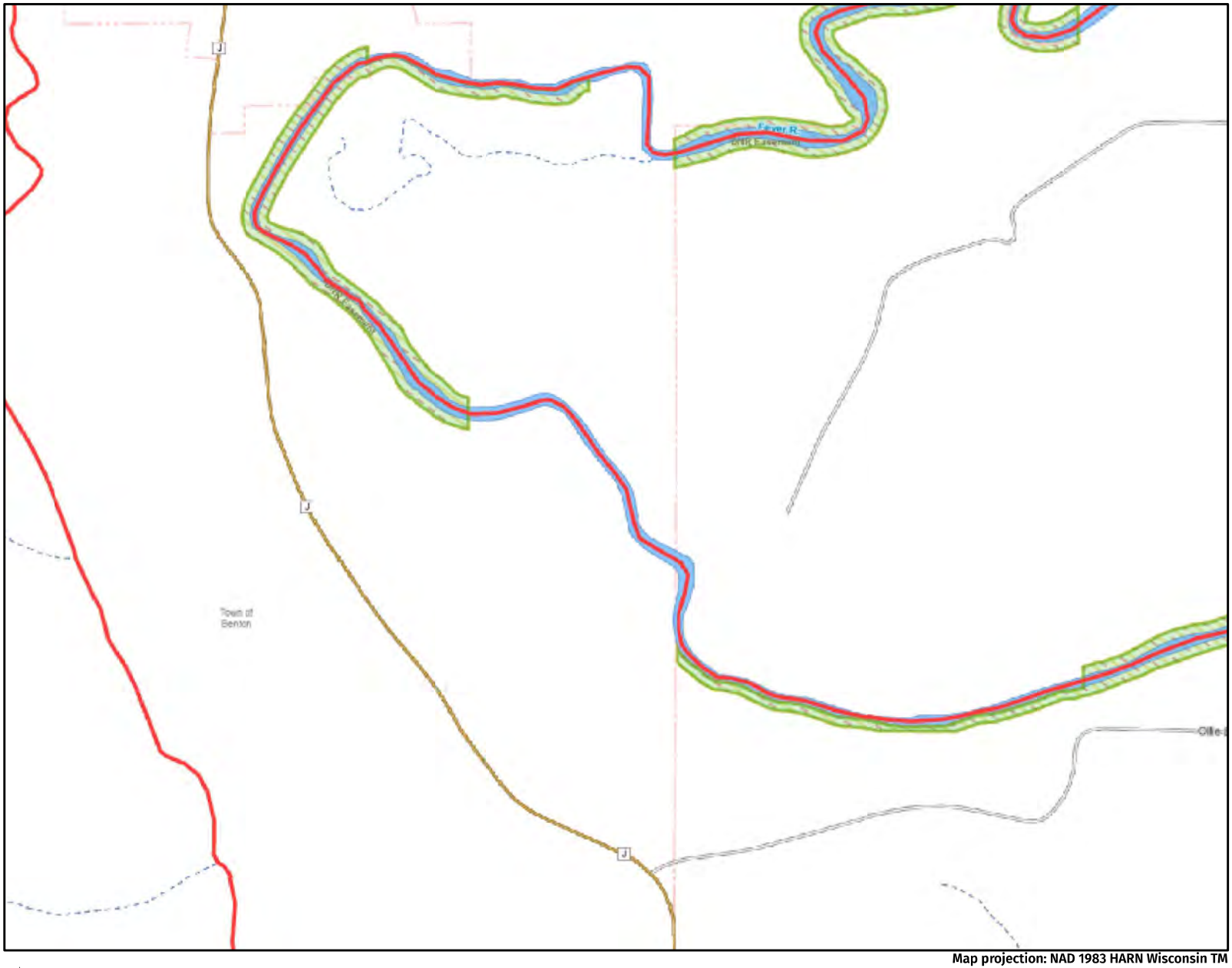
In this case, the calculated daily maximum of 14 mg/L is more restrictive than the calculated weekly and monthly average limits. Therefore, **monthly and weekly average limits of 14 mg/L** are recommended in the permit.

Cuba City WWTP - HUC 12 Land Usage

| Land use | Soil group | Area (acres) | Combined Acres | % of Total Acres |
|---|---|---|---|---|
| Open Water | B | 1 | 1 | 0.0% |
| Open Space/Park | A | 11 | | |
| Open Space/Park | B | 1,249 | 1,334 | |
| Open Space/Park | C | 25 | | |
| Open Space/Park | D | 50 | | 4.1% |
| Low-Density Residential (general 1/3 - 2 ac lots) | A | 7 | | |
| Low-Density Residential (general 1/3 - 2 ac lots) | B | 504 | | |
| Low-Density Residential (general 1/3 - 2 ac lots) | C | 2 | | |
| Low-Density Residential (general 1/3 - 2 ac lots) | D | 4 | 517 | 1.6% |
| High-density Residential (townhomes to 1/4 ac lots) | A | 1 | | |
| High-density Residential (townhomes to 1/4 ac lots) | B | 71 | | |
| High-density Residential (townhomes to 1/4 ac lots) | D | 0 | 72 | 0.2% |
| Commercial/Industrial/Transportation | B | 6 | 6 | 0.0% |
| Barren Land | B | 4 | 4 | 0.0% |
| Deciduous Forest | A | 60 | | |
| Deciduous Forest | B | 3,085 | | |
| Deciduous Forest | C | 34 | | |
| Deciduous Forest | D | 516 | 3,695 | 11.4% |
| Evergreen Forest | A | 2 | | |
| Evergreen Forest | B | 63 | | |
| Evergreen Forest | D | 6 | 71 | 0.2% |
| Mixed Forest | B | 6 | | |
| Mixed Forest | D | 2 | 7 | 0.0% |
| Shrub; Scrub | A | 8 | | |
| Shrub; Scrub | B | 227 | | |
| Shrub; Scrub | C | 2 | | |
| Shrub; Scrub | D | 30 | 268 | 0.8% |
| Grassland; Herbaceous | A | 2 | | |
| Grassland; Herbaceous | B | 159 | | |
| Grassland; Herbaceous | C | 1 | | |
| Grassland; Herbaceous | D | 15 | 177 | 0.5% |
| Pasture/Hay | A | 42 | | |
| Pasture/Hay | B | 6,639 | | |
| Pasture/Hay | C | 82 | | |
| Pasture/Hay | D | 539 | 7,302 | 22.5% |
| Cropland generalized agriculture | A | 240 | | |
| Cropland generalized agriculture | B | 18,067 | | |
| Cropland generalized agriculture | C | 124 | | |
| Cropland generalized agriculture | D | 406 | 18,837 | 58.1% |
| Woody Wetlands (swamp) | B | 63 | | |
| Woody Wetlands (swamp) | C | 5 | | |
| Woody Wetlands (swamp) | D | 8 | 76 | 0.2% |
| Emergent Wetlands (marsh) | B | 36 | | |
| Emergent Wetlands (marsh) | C | 14 | 50 | 0.2% |
| | Total | 32,418 | | |

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

# Galena(Fever River)




**Legend:** (some map layers may not be displayed)

Impairment Status Rivers Streams
- 303d Listed

Impairment Source River Stream
- Point and Nonpoint Source Blend

Municipality
- City or Village
- Township
- State Boundaries
- County Boundaries

County and Local Roads
- County HWY
- Local Road

- Rivers and Streams
- Intermittent Streams
- Open Water
- DNR Managed Lands

**Notes:**

**Map projection: NAD 1983 HARN Wisconsin TM**

N

Map: 0 880 1,760 Feet
0 260 520 Meters

Service Layer Credits:
Impairment Details: Wisconsin Department of Natural Resources, Bureau of Water Quality, EN Detailed
Basemap WTM Ext:




*Date Printed: 5/5/2025 3:40 PM*

# Coon Branch, Galena River Watershed (GP01)

Return to Search

## Coon Branch (936500)

**Size**

Coon Creek. Photo by Peggy Compton, UW-Extension.

5.21 Miles

| | |
|---|---|
| **Segment** | 0 - 5.21 |
| **Natural Community** | Cool-Cold Headwater |
| **Year Last Monitored** | 2015 |
| **General Condition** | Poor |
| | This river is impaired |
| **Impairments include** | Degraded Biological Community |
| **Pollutants include** | Unknown Pollutant |

Overview | Conditions | Goals | Monitoring & Projects | Ecosystem Challenges | Fish & Habitat | Photo Gallery | Map Gallery

## Overview

| | |
|---|---|
| **County** | Lafayette |
| **Trout Water** | No |
| **Outstanding or Exceptional** | No |
| **Impaired Water** | Yes |

### Fish and Aquatic Life

| | |
|---|---|
| **Current Use** | Restricted Aquatic Life |
| **Attainable Use** | WWSF |
| **Designated Use** | LFF |

Coon Branch rises near Cuba City and flows southeasterly to its junction with the Galena River. Cuba Citys wastewater treatment facility discharges to a small tributary of Coon Branch. Data collected during the 1990s suggested that the stream may be impacted by heavy metal contamination from historic mining. While a fishery survey conducted in 2008 showed good numbers of common shiners, creek chubs, hornyhead chubs, and southern redbelly dace, the stream lacked the diversity of species of other streams in the area. A bioassay should be conducted to determine if metal toxicity may be a factor in

limiting this stream's potential. There is also a perched culvert at Beebe Road which may be limiting fish movement up from the Galena River.

**Date** 2010

**Author** James Amrhein

## Overview

Coon Branch rises near Cuba City and flows southeasterly to its junction with the Galena River. The stream is currently classified as Limited Aquatic Life (LAL) and Limited Forage Fishery (LFF) for three miles of its length. A mining waste pile and a local solid waste disposal site in its headwaters has caused water quality, habitat and fisheries problems in the past, however these problems have since been remediated. Monitoring done in 1994 showed the stream supported a moderately diverse and fairly pollution intolerant macroinvertebrate (aquatic organisms) community. However, there was a scarcity of fish at the monitoring sites and only a few Creek chubs, a very pollution tolerant species. One water chemistry sample showed an elevated level of lead in the water column (Marshall, 1995). High levels of lead in bench soils adjacent the stream have also been reported (Edwards, 2001). Water taken from the stream failed acute and chronic toxicity for one parameter in recent tests (April, 2000). Additional monitoring is needed to assess the nature of water quality problems in this stream. An aquatic species that is very sensitive to water pollution and listed on the state's threatened and endangered species list had been found along Coon Branch near Benton in the early 1980's (DNR, 1997). No current recorded sightings of it have occurred. Cuba City's wastewater treatment plant discharges to a small tributary to Coon Branch. Population growth rate for Cuba City during the period from 1990 through 1997 was slightly less than 1%.

**Date** 2001

**Author** Aquatic Biologist

## Historical Description

Being a warm water drainage stream of moderate size, it is managed for forage fishes. However, at the time of sampling for this inventory, the water exhibited a high acidity in the area of Benton presumably as a result of mine pollution. Eventually, this stream enters the Fever River (Galena) about four miles below Benton. Gravel and bedrock are the principal bottom types af the stream with silt being found in the area of the mouth. Most of the land in the watershed is used for agricultural purposes. The Cuba City (Grant County) sewage treatment plant effluent enters near its headwaters. Upland game, such as deer, Hungarian partridge, pheasants, squirrels and rabbits are fairly common throughout the watershed while some waterfowl and muskrats can be found near its mouth. There is no land in public ownership at 'present. Access is possible from five road bridges and is considered adequate for this stream.

Coon Branch, R1N, R1E, Sections 33-11,Surface acres = 7.3, Miles = 6.8, Gradient = 31.7 feet per mile, Total alkalinity = 185 mg/l, Volume of flow = 1.6 cfs.

From: Piening, Ronald; Poff, Ronald; Threinen, C.W., 1967. Lake and Stream Classification Project. Surface Water Resources of Lafayette County, Wisconsin Department of Natural Resources, Madison, WI.

**Date** 1967

**Author** Aquatic Biologist

# Gelena River, Galena River Watershed (GP01)

Return to Search

## Gelena River (935500)

**Size**

The Galena River. Photo by Jim Amrhein, WDNR.

32.64 Miles

| | |
|---|---|
| **Segment** | 19.43 - 52.07 |
| **Natural Community** | Cool-Cold Mainstem, Macroinvertebrate, Cool-Cold Headwater, Cool-Warm Mainstem |
| **Year Last Monitored** | 2015 |
| **General Condition** | Poor |
| | This river is impaired |
| **Impairments include** | Degraded Biological Community |
| **Pollutants include** | Unknown Pollutant |

Overview | Conditions | Goals | Monitoring & Projects | Ecosystem Challenges | Fish & Habitat | Photo Gallery | Map Gallery

## Overview

| | |
|---|---|
| **County** | Lafayette |
| **Trout Water** | No |
| **Outstanding or Exceptional** | Yes |
| **Impaired Water** | Yes |

### Fish and Aquatic Life

| | |
|---|---|
| **Current Use** | Restricted Aquatic Life |
| **Attainable Use** | WWSF |
| **Designated Use** | Default FAL |

The Galena River, locally known as the Fever River, is the major river system for which this watershed is named. It rises in western Lafayette County and flows south 35 miles into Illinois. While smallmouth bass have been reduced in numbers in many southwestern Wisconsin streams, the Galena River is still considered one of the best bass streams in southern Wisconsin. It was added to the state's list of Exceptional Resource Waters (ERW) in 1995, in part due to the significance and importance of the smallmouth bass fishery. Two

municipalities, Benton and Hazel Green, operate wastewater treatment facilities that discharge to the river. While Galena River Watershed Plan 2010 there are a number of abandoned lead and zinc mines and mining waste piles in the watershed, they seem to have little effect on the river's water quality. A bioassay conducted in 2010 showed no toxicity to aquatic organisms. Fisheries surveys conducted in 2007 and 2008 on the lower ½ of the river showed good numbers of smallmouth bass as well as a diversity of non-game species. The Ozark minnow, a state threatened species, was found at one of the sites. While intense agriculture and manure runoff likely have impacted the Galena River just as it has other streams in the watershed, the stream appears to be maintaining its use as a cool-warm transitional stream and an important smallmouth bass resource.

**Date** 2010

**Author** James Amrhein

## Historical Description

The Galena River rises in western Lafayette County and flows south into Illinois. It is also called the Fever River by local residents, and is identified on recent state highway maps as the Fever. The river is one of the best smallmouth bass streams in southern Wisconsin (Lyons, 1990). The Galena was added to the state's list of Exceptional Resource Waters (ERW) in 1995 in part due to the significance and importance of the smallmouth bass fishery.

Evaluation monitoring done as a follow-up to the priority watershed project indicates that installed BMPs were effective in reducing non-point source pollution. However, other uncontrolled pollution sources may be undoing or at least masking the improvements made by BMP installation (Kroner, et.al., 1992). The river carries excessive sediment loads during and after summer storm events. This sediment is from cropland and streambank erosion (Fix, 1991). As a result, instream habitat, fisheries and recreational uses are still being affected by non-point sources of pollution.

There are a number of abandoned lead and zinc mines and mining waste piles in the Galena Watershed. It is not known what effect, if any, these are having on the river's water quality, instream habitat and fisheries. Past water chemistry grab samples showed no unusual or elevated levels of heavy metals in the water column. Results of recent bio-assays tests also showed no indication of a toxicity problem in the stream (WDNR, 2000).

Index of Biotic Integrity (IBI) monitoring at two sites on the Galena in 1994 showed "fair" and "good" water quality. Instream habitat ratings at the same two sites indicated "good" and "excellent" habitat (Wang et.al., 1994). Fish surveys conducted over five years at one site on the river has shown wide fluctuation in the number of smallmouth bass caught at that site (Wang,et.al., ibid). The variability of the smallmouth bass population has been studied and reported (Forbes, 1989). Macroinvertebrate sampling conducted in 1995 and 1996 found the Galena to have fair water quality with a high percentage of mayflies, caddisflies and stoneflies which can indicate fairly good water quality (Marshall, 1999).

In the spring of 2000, monitoring was conducted on two sites in the river's headwaters at the Platteville Ag Stewardship Farm (PASF). This macroinvertebrate sampling, just below College Farm Road, found fair water quality. Some mayflies were sampled, but a large percentage of macroinvertebrates were of the order diptera, or two winged flies (WDNR 2000). Baseline sampling conducted in October 2000 determined cool or cold water habitat to be poor or very poor for fish. Habitat evaluations at the sites found very silty conditions, mostly likely due to cropland erosion, streambank pasturing and streambank erosion in the Galena River subwatershed (WDNR 2000). The Illinois Environmental Protection Agency assessed eighteen miles of the Galena River in Illinois. The resource quality in that portion of the river was rated as "good" for nine miles and "fair" for nine miles. Nutrients and habitat alterations were the major causes of impairment. A couple of pollution sensitive aquatic species listed on

Wisconsin's threatened and endangered species list have been found in the Galena River.

The DNR has acquired fishing easements along some reaches of the Galena River for additional public access. Two municipalities, Benton and Hazel Green, operate wastewater treatment facilities that discharge to the Galena River. Hazel Green's population growth rate between 1990 and the end of 1997 was 0.5%, while Benton's growth rate during the same period was about 0.6%. This shows that neither community is growing and indicates that urban stormwater and non-point sources of pollution are not considered a major problem.

**Date** 2001

**Author** Aquatic Biologist

# Appendix D

# WWTF Streambank Stabilization Projects

# Operation and Maintenance Plan
# Streambank Protection: NRCS - 580

Responsible Party: City of Cuba City Date: 02/05/26

Prepared By: Peter C. Riddle Title: Houtakker Project

Prepared For: The City of Cuba City, WI

Project Location: Houtakker property - PID: 006:0280.1000, 006:0283.2000, 024.0134.1000

This party Cuba City agrees to the following until project termination.

1. Check the riprap, plantings where applicable, and/or tree revetments once each year and immediately after severe floods, or other high flow events. Rock removed or displaced shall be replaced as needed. Replant any damaged tree plantings. Repair or replace any damaged or missing revetments. Repair work shall take place during periods of low stream flow.
2. Logs, trees, driftwood, and other debris lodged in or near the riprap shall be removed.
3. Monitor for impacts from livestock. If livestock traffic paths destroy vegetation on streambanks, livestock access to that area shall be restricted and reseeded immediately
4. If livestock damage is persistent, establishment and implementation of a NRCS 528 Grazing Plan shall be incorporated
5. Streambank upland pasture area is managed at a density of 0.26 animal units per acre
6. Check for sloughing, erosion, or damage to vegetative cover where applicable. Damaged areas shall be graded, shaped, and re-vegetated as soon as possible.
7. Immediately repair any damage.
8. Eliminate access to foot traffic to the streambank within the buffer zone except for any designated pathway or landings.
9. Eliminate all burrowing rodents and repair damage caused by them
10. All damage, repairs, and site conditions shall be reported annually to the WDNR as required

Responsible Parties Signature: George Moriarty Date: 02/05/26

United States Department of Agriculture
Natural Resources Conservation Service

WISCONSIN STANDARD
DRAWING NO. WI-001C 03/16

# CONSTRUCTION PLAN

PRACTICE(S) STREAMBANK PROTECTION (580) STREAM HABITAT (395)
CRITICAL AREA (395) SPOIL DISPOSAL (572)

LANDOWNER DAVID HOUTAKKER

ADDRESS 2295 KIRKWOOD RD CUBA CITY, WI 53807

LANDOWNER PHONE NO. 563-590-7141 COUNTY LAFAYETTE

TOWNSHIP BENTON/NEW DIGGINS T 1 N, R 1 E Sec 16,15,21

FIELD OFFICE DARLINGTON TELEPHONE NO. 608-776-4028

DIGGERS HOTLINE

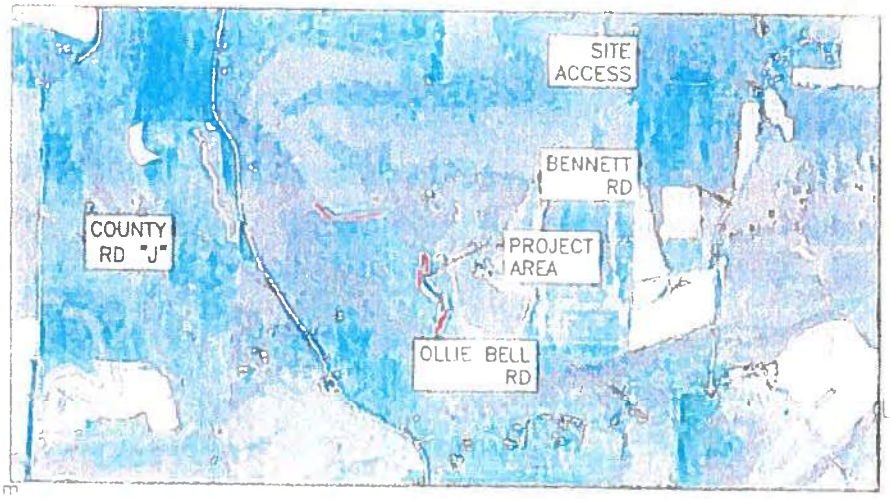
Call 3 Work Days Before You Dig!

Nationwide 811

Toll Free 1-800-242-8511

TDD 1-800-542-2289

Website www.diggershotline.com




Not to Scale

LOCATION MAP

## NOTICE TO LANDOWNERS AND EXCAVATORS

Any representation made by the USDA, Natural Resources Conservation Service, or the LAFAYETTE County LCD, as to the approximate location or nonexistence of above or under ground hazards does not relieve the owner of the property or the excavator that is hired to complete construction, from notifying Diggers Hotline of the pending construction. You will be liable for damages resulting from construction activities Call Diggers Hotline! Ticket Number

## CONSTRUCTION DRAWINGS AND SPECIFICATIONS ACCEPTANCE

I have reviewed and understand the construction plans and specifications and agree to complete the work accordingly. Failure to meet these plans and specifications may jeopardize any continued NRCS technical assistance or program cost sharing applied for. I understand that it is my responsibility to secure all necessary permits and licenses and to complete the work in accordance with all local, state, and federal laws. Modification of these construction plans & specifications must be approved by the NRCS before installation. I assume all responsibility for negotiations and contract agreements with the construction contractors.

† Landowner Signature: David Houtakker Date 3-21-22

Designed by TONY STRENZ Date 2/2022

Checked by Robert Bauer Date 2/2022

Approved by MICHEL DREISCHMEIER Digitally signed by MICHEL DREISCHMEIER Date 3/9/22

The installed practices comply with applicable NRCS technical standards and specifications. The "redlined" construction plans (as-built drawings) reflect changes made during construction.

Construction Approved by Date

Job Approval Class 580-III, 395-II, 342-II, 572-V

## CONSTRUCTION NOTES

1. ALL UNDERGROUND HAZARDS AND UTILITIES MUST BE INVESTIGATED PRIOR TO CONSTRUCTION. NOTIFICATION OF THE EFFECTED UTILITY COMPANIES IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTACT DIGGERS HOTLINE AT LEAST THREE DAYS PRIOR TO START OF CONSTRUCTION.

2. A PRE-CONSTRUCTION CONFERENCE SHALL BE SCHEDULED WITH NRCS PERSONNEL, THE CONTRACTOR AND THE LANDOWNER PRIOR TO CONSTRUCTION START UP, WHERE NRCS PERSONNEL WILL STAKE OUT THE PROJECT BOUNDARIES. NRCS WILL NOT MAKE THEMSELVES AVAILABLE FOR CONSTRUCTION CHECKS UNLESS DIGGERS HOTLINE HAS BEEN NOTIFIED AND THE SITE IS MARKED, NRCS WILL NEED THE DIGGERS HOTLINE TICKET NUMBER. ALSO, IF A PRE-CONSTRUCTION CONFERENCE IS NOT HELD AND THE PROJECT STARTS, BEAR IN MIND THAT MAY BE RE-WORK NEEDED TO MEET STANDARDS, SPECIFICATIONS AND CONTRACT REQUIREMENTS.

3. THE CONTRACTOR AND/OR LANDOWNER WILL NOTIFY NRCS THREE DAYS PRIOR TO CONSTRUCTION START UP, SO WE CAN MAKE OURSELVES AVAILABLE FOR ASSISTANCE.

4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH WISCONSIN CONSTRUCTION SPECIFICATIONS, ATTACHED TO THIS PLAN.

5. ROCK FOR THIS PROJECT WILL BE AN 8" D50 AND MUST COME FROM AN NRCS APPROVED QUARRY, THE ROCK MUST BE SOUND AND WELL GRADED, ANY WEAKLY CEMENTED MATERIALS WILL BE REFUSED.

6. NRCS PERSONNEL MUST BE ONSITE FOR THE INSTALLATION OF THE ROCK DEFLECTORS, PLEASE PLAN ACCORDINGLY.

7. AFTER INSTALLATION OF ALL ROCK FEATURES AND BANK SHAPING, THE BANKS WILL BE COVERED WITH 6" OF TOPSOIL, DOWN TO WITHIN 6" OF THE WATERLINE AND SEEDED WITH THE SEED MIX DEPICTED ON PAGE 9 OF THIS PLAN. AFTER SEEDING, MULCH WILL BE APPLIED WITH THE GUIDANCE GIVEN ON PAGE 10 OF THIS PLAN.

8. LANDOWNER OR CONTRACTOR WILL HAVE THE SEED MIX ON HAND PRIOR TO CONSTRUCTION STARTING.

9. SPOILS CAN BE SPREAD THINLY ON THE CROP FIELDS INDICATED ON PAGE 5 OF THIS PLAN.

## ESTIMATED QUANTITIES

| ITEM | UNIT | QUANTITY | SHEET NUMBER | WI CONSTRUCTION SPEC OR JOB SHEET NUMBER |
|---|---|---|---|---|
| **STREAMBANK PROTECTION** | | | | |
| RIP RAP/BANK > 9' | LN.FT. | 1650 | 2,3,4,6 | WCS #2, 9 |
| 8" D50 ROCK FOR RIP RAP | CU.YDS. | 2671 | 2,3,4,6 | WCS #9 |
| **STREAM HABITAT** | | | | |
| ROCK DELFECTORS/ 12 CU.YDS PER | EACH | 7 | 2,3,4,7 | WCS #2, 9 |
| 8"D50 ROCK FOR DEF. | CU.YDS. | 84 | 2,3,4,7 | WCS #9 |
| **BANK SHAPING** | LN.FT. | 690 | 3,4,8 | WCS #2 |
| **SPOIL SPREADING** | CU.YDS. | 5511 | 2,3,5 | |
| **SEEDING & MULCHING** | ACRE | 1.6 | 2,3,9,10 | WI-710SS |
| **BACKWATER REFUGE** | SQ.FT. | 1650 | 3,4,9 | WCS #2 |
| | | | | |
| | | | | |
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All quantities are calculated on neat lines and grades. The estimated quantities listed represent all work items necessary to complete this project. Items not specifically listed shall be considered incidental to those listed Geotextile quantity does not include overlap.

Contractors must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the drawings and specifications.

It is the responsibility of the contractor to bring any omissions or discrepancies in the bid schedule to the attention of the owner and NRCS. Failure to do so shall in no way relieve the contractor from any obligation in respect to the bid

Prompt clarification of noted omissions and discrepancies will be supplied by NRCS

USDA United States Department of Agriculture

Natural Resources Conservation Service

DAVID HOUTAKKER
LAFAYETTE

A 2/22

MI 2/22
MOD 3/2022

USDA

United States
Department of
Agriculture

Natural Resources
Conservation Service

STREAMBANK PLAN VIEW

CLIENT: DAVID HOUTAKKER

COUNTY: LAFAYETTE

| Designed | AJS | Date 2/2022 |
|---|---|---|
| Drawn | | |
| Checked | MI | 3/22 |
| Approved | MDD | 3/22 |

| Drawing Name | Sheet 4 of 13 |
|---|---|
| WI-012 | |
| Date | |
| 06/14 | |




NOT TO SCALE. NRCS PERSONNEL WILL STAKEOUT LOCATIONS IN THE FIELD

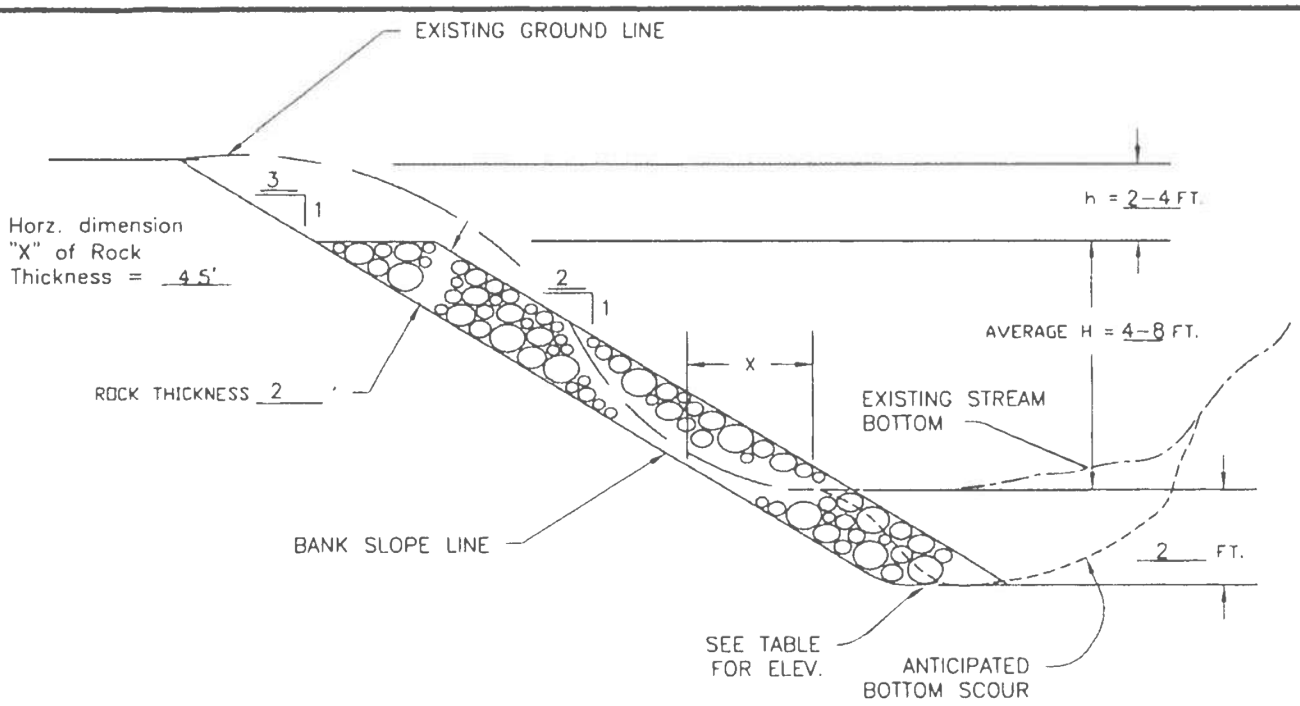
RED HASHED AREAS CAN RECEIVE SPOILS FOR DISPOSAL. PLEASE NOTE THAT THESE SITES CANNOT BE REACHED FROM THE PROJECT AREA. THE SPOILS WILL NEED TO BE TRUCKED ON TOWNSHIP AND COUNTY ROADS.

USDA United States Department of Agriculture
Natural Resources Conservation Service

SPOIL DISPOSAL PLAN VIEW

CLIENT: DAVID HOUTAKKER
COUNTY: LAFAYETTE

| | Date | |
|---|---|---|
| Designed AJS | 2/2022 | Drawing Name WI-012 |
| Drawn | | Date 06/14 |
| Checked MT | 2/22 | |
| Approved MOD | 3/22 | Sheet 5 of 13 |




TYPICAL CROSS SECTION

GRADATION OF ROCK

| PERCENT PASSING BY WEIGHT | SIZE (INCHES) |
|---|---|
| 100 | 16 |
| 60-85 | 12 |
| 25-50 | 8 |
| 5-20 | 4 |
| 0-5 | 1.6 |

| BEND | LENGTH/CU.YDS./HEIGHT |
|---|---|
| #1 | 975'/1632 CU.YDS./10' |
| #2 | 130'/232 CU.YDS./10' |
| #4 | 185'/194 CU.YDS./6' |
| #7 | 360'/613 CU.YDS./10' |
| | |
| | |
| | |

QUANTITY ESTIMATE *

| | | |
|---|---|---|
| BANK SLOPING FOR RIPRAP | 1650 | LIN. FT. |
| BANK SLOPING (SEEDING ONLY) | 690 | LIN. FT. |
| ROCK FOR RIPRAP (WI CONST. SPEC. 9) | 2671 | CU. YD. |
| SEEDING | 1.6 | ACRES |

* ESTIMATED TO THE NEAT LINES AND GRADE

NOTE:

1. DOUBLE THE ROCK THICKNESS FOR A DISTANCE OF 5 FEET AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE RIPRAP. BLEND THE ROCK SURFACE TO MATCH THE EXISTING STABLE BANK SURFACE.
2. TOE PROTECTION SHALL BE PROVIDED TO A MINIMUM DEPTH OF THE ANTICIPATED BOTTOM SCOUR, WHICH WILL BE BELOW THE EXISTING STREAM BOTTOM.
3. ON BEND 1 THE SLOPE WILL BE 2:1 TO THE OWHM AND 3:1 FROM OHWM TO TOP OF BANK.

EXCAVATED TOE

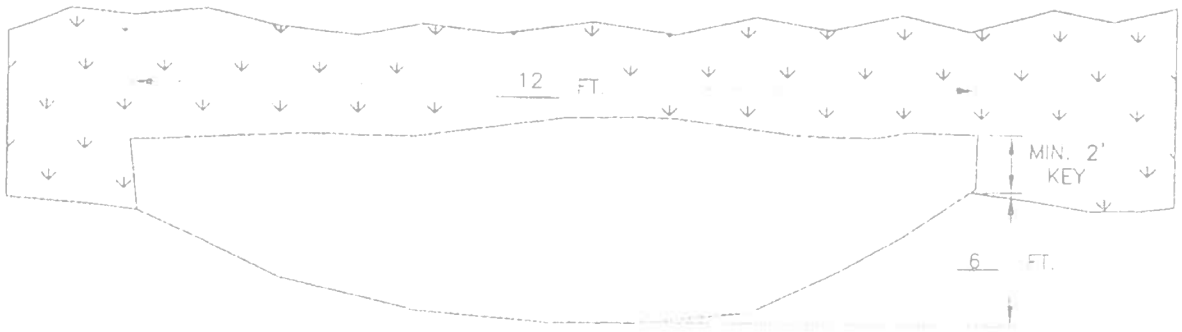
USDA United States Department of Agriculture
Natural Resources Conservation Service

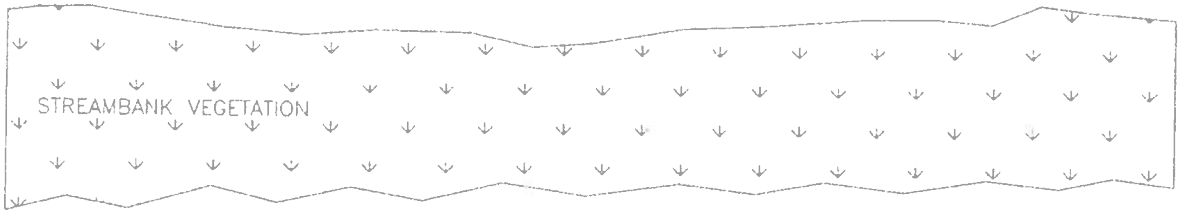
STREAMBANK PROTECTION
NO FILTER OR GEOTEXTILE
(PARTIAL BANK HEIGHT)

CLIENT: DAVID HOUTAKKER
COUNTY: LAFAYETTE

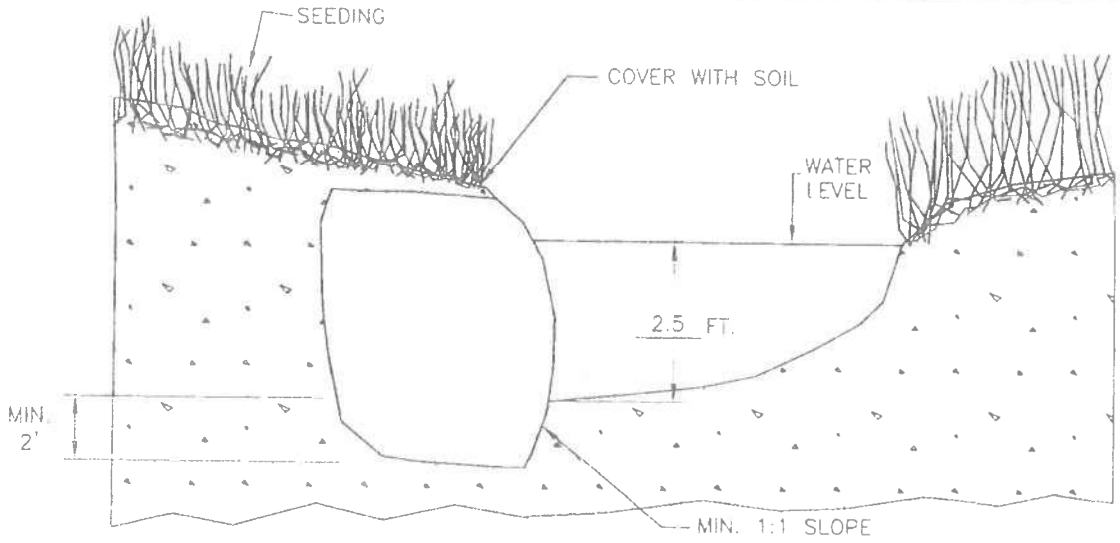
| | | Date |
|---|---|---|
| Designed | AJS | 2/2022 |
| Drawn | | |
| Checked | MI | 2/22 |
| Approved | MOD | 3/22 |

File Name: WI-404E-ET
Date: 07/14
Sheet 6 of 11




PLAN




CROSS SECTION

NOTE: CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID STREAMBANK EROSION ON OPPOSITE BANK.

| ROCK GRADATION | |
|---|---|
| PERCENT PASSING BY WEIGHT | SIZE IN INCHES |
| 100 | 16 |
| 60–85 | 12 |
| 25–50 | 8 |
| 5–20 | 4 |
| 0–5 | 1.6 |

| QUANTITIES | | |
|---|---|---|
| ROCK RIPRAP FOR ROCK DEF. (W.C.S.* 9) | 84 | CU. YD. |

*W.C.S. = WI. CONSTRUCTION SPECIFICATION
*ESTIMATED TO THE NEAT LINES AND GRADE

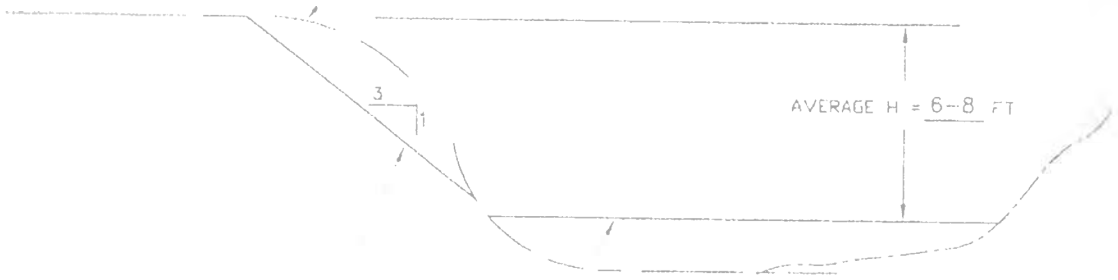
USDA United States Department of Agriculture
Natural Resources Conservation Service

ROCK DEFLECTOR

CLIENT: DAVID HOUTAKKER
COUNTY: LAFAYETTE

| | | Date |
|---|---|---|
| Designed | AJS | 2/22 |
| Drawn | | |
| Checked | MI | 2/22 |
| Approved | MOD | 3/22 |

File Name: WI-933
Date: 08/14
Sheet 7 of 13




TYPICAL CROSS SECTION

QUANTITY ESTIMATE

| | | |
|---|---|---|
| BANK SLOPING (SEEDING ONLY) | 690 | LIN. FT. |
| SEEDING | 1.6 | ACRES |

* ESTIMATED TO THE NEAT LINES AND GRADE

NOTES: ALL SHAPING WILL START AT THE OHWM

SITE BENDS 3,5,6

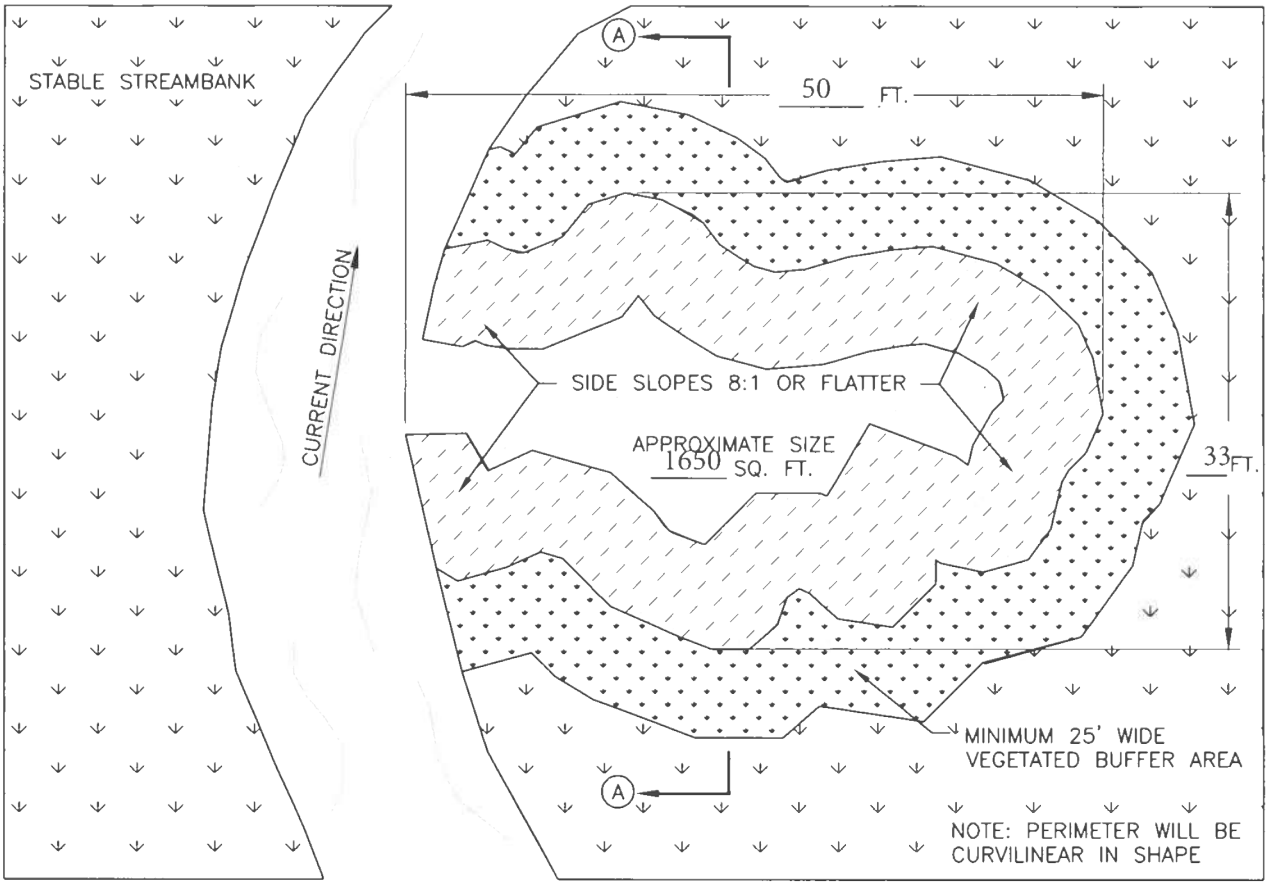
USDA United States Department of Agriculture
Natural Resources Conservation Service

STREAMBANK SHAPING

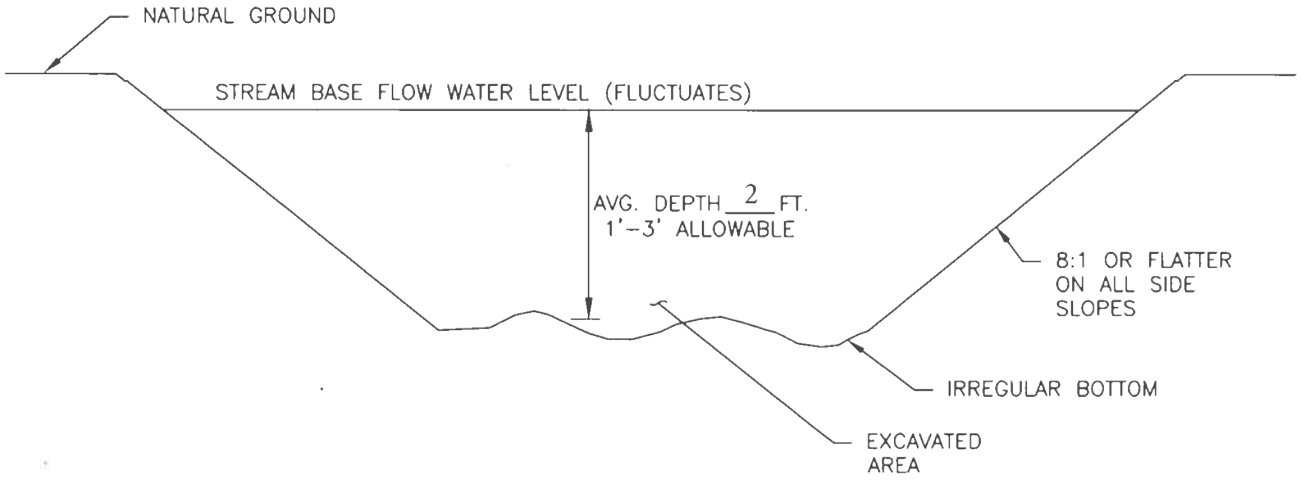
CLIENT: DAVID HOUTAKKER
COUNTY: LAFAYETTE

| | | Date |
|---|---|---|
| Designed | AJS | 2/22 |
| Drawn | | |
| Checked | MI | 2/22 |
| Approved | MOD | 3/22 |

File Name WI-404F-LT
Date 6/07
Sheet 8 of 13




PLAN VIEW




TYPICAL CROSS SECTION A-A



| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | BACKWATER REFUGE<br>CLIENT: DAVID HOUTAKKER<br>COUNTY: LAFAYETTE | Designed ALS Date 4/22/22<br>Drawn<br>Checked ajs<br>Approved ajs | File Name WI-931<br>Date 06/2019<br>Sheet 10 of 13 |

# CONSTRUCTION NOTES FOR BACKWATER REFUGE

1. BACKWATER REFUGES ARE TO BE IRREGULAR IN SHAPE WHEN COMPLETED. WHEEL RUTS ARE ALLOWED AND DESIRED. THE REFUGE NEEDS TO BE CONSTRUCTED TO THE APPROXIMATE SURFACE AREA, DEPTH AND IRREGULARITY AS WHAT IS FLAGGED BY NRCS STAFF.

2. ALL EXCAVATION SHALL BE IN ACCORDANCE WITH WISCONSIN CONSTRUCTION SPECIFICATION #2.

3. RE-TOPSOILING MAY BE NEEDED. IF NEEDED A MINIMUM OF 6" OF TOPSOIL WILL BE REMOVED FROM REFUGE SITE AND STOCKPILED FOR RE-SPREADING. BEFORE TOPSOIL IS RE-SPREAD THE DEPTH AND SLOPES MUST BE CHECKED. SEEDING SHOULD BE COMPLETED PER DRAWING WI-710 FOR INTRODUCED SPECIES OR DRAWING WI-711 FOR NATIVE SPECIES.

4. THE FINISHED SIDE SLOPES ARE TO BE 8:1 OR FLATTER.

5. EXCAVATED SPOIL FROM THE REFUGE SHALL BE:
   a. REMOVED FROM THE REFUGE/FLOODPLAIN AREAS AND PLACED AS INDICATED ON THE PLAN VIEW.
   b. PLACED BELOW THE PLANNED NORMAL WATER ELEVATION OF THE POOL FOR REFUGE MICROTOPOGRAPHY.
   c. SPREAD ABOVE THE PLANNED NORMAL WATER ELEVATION IN A LAYER AVERAGING NO MORE THAN 3-6 INCHES THICK. SPREAD IN THE LOCATIONS INDICATED ON THE PLAN VIEW FOR THIS PROJECT. NO FILL SHALL BE PLACED IN AN EXISTING WETLAND.

6. BASKING AREAS MAY BE ADDED AS APPROVED BY NRCS STAFF. THESE AREAS CAN CONSIST OF LOGS/WOODY DEBRIS OR PILES OF STONE ADDED TO THE REFUGE. THESE ADDITIONS SHOULD BE PLACED A MINIMUM OF 3-4 FEET FROM THE EDGE OF THE REFUGE TO ACT AS A BASKING AREA AND BE FAR ENOUGH INTO REFUGE TO MINIMIZE PREDATION.

7. BUFFER SEED MIXES SHOULD BE STRONGER IN FORB AND SHORT GRASS COMPONENTS. THIS WILL CREATE MORE INTERSTITIAL SPACE, AIDING IN REPTILE/AMPIBIAN MOVEMENT AND BASKING PER WI-710 OR WI-711.

SEEDING DATES — SOUTH

| TIME PERIOD | DATES | | | TYPE OF SEEDING |
|---|---|---|---|---|
| Spring | April 1 | through | May 15 | Permanent |
| Summer | May 16 | through | see WI-710ss pg 2 | Temporary * |
| Late Summer | August 7 | through | August 29 | Permanent |
| Fall | August 30 | through | see WI-710ss pg 2 | Temporary * |
| Late Fall | November 1 | through | Snow Cover | Dormant |
| Winter | Snow Cover | through | March 31 | Not Allowed |

## MATERIALS

If no soil test is available, apply a minimum of 150 pounds of 20-10-10 fertilizer per acre. This is equivalent to 30 pounds nitrogen (N), 15 pounds phosphate (P205), and 15 pounds potash (K2O) per acre. Apply two tons / acre of 80-89 lime or equivalent. (See page 2 for equivalent)

* Seed a temporary cover crop of Oats at 64 # /ac ( 2 bu/ac)
A permanent seeding shall be completed during the next acceptable time period following a temporary seeding

MINIMUM PURE LIVE SEED (PLS) [1] RATE PER ACRE AND TOTAL POUNDS OF SEED NEEDED

| | SEEDING MIX (DESIGN) Custom | LOCATION: Disturbance | |
|---|---|---|---|
| | | ACRES: 1.60 | |
| | SPECIES | RATE | POUNDS |
| | Creeping Red Fescue | 5.8 | 9.2 |
| | Side Oats Gramma | 1.2 | 1.8 |
| | Black Eyed Susan | 1.2 | 1.8 |
| | Purple Prairie Clover | 1.2 | 1.8 |
| | Bergamont | 1.2 | 1.8 |
| | | | |
| ** | Annual Ryegrass | 6.0 | 9.6 |

| SEEDING MIX (AS-BUILT) | LOCATION ACRES | |
|---|---|---|
| SPECIES | RATE | POUNDS |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

[1] PLS lbs = ( total % Germination 100 * % Purity / 100) * Net Weight (lbs )

ADDITIONAL SEED PERCENT 15 %

Mulching Required Yes

** Companion Crop

*Total %* Germination may also be termed *Total %* Viable Seed on a tag. If a tag only shows % Germination, the user must *include percentage of the seed that germinated during the lab test* (% Germination) **plus** the *percentage of hard and/or dormant seed* Hard seed and dormant seed are seeds that are still capable of germinating and producing a plant but did not germinate under the conditions of the test in the lab.

Additional native seeds may be required by permitting agencies. These addition are allowed.
Seed mixture shall meet all requirements of the WI weed laws.
Species identified as restricted or prohibited by law shall not be planted.
Certified seed shall be used. and the seeding rates will be based on pure live seed.
For dormant seedings, increase the seeds per square foot by 15%.

## SEEDBED PREPARATION

Seedbed preparation shall immediately follow construction activities.
Prepare a fine, firm seedbed to a minimum depth of three inches. A seedbed is considered firm when a footprint penetrates less than 1/4 inch deep.

SEEDING

Inoculate legumes with the specific inoculum for the species in accordance with the manufacturer's recommendations. When using a hydroseeder, five times the recommended rate of inoculant shall be added to the hydroseeder. Inoculant shall not be mixed with liquid fertilizer.

Seed may be broadcast or drilled as appropriate to the site.
Seed, fertilize, and lime as soon as possible after construction.
Seeding perpendicular to direction of flow is required to limit erosion.

Seed grasses and legumes no more than 1/4 inch deep.

Consider seeding at a lower rate and making 2 passes to ensure more uniform distribution.

TEMPORARY SEEDING OPTIONS

Select one of the following species for temporary cover if:

1) The required seeds or plant stock are not available or
the normal permanent seeding period for the species has passed
   - Forage Sorghum - 1/2 bushel per acre (May 15-July 15)
   - Sorghum - Sudangrass Hybrid - 1 bushel per acre (May 15-July 15)
   - Sudangrass - 1 bushel per acre (May 15-July 15)
   - Winter Wheat - 2 bushels per acre (Aug 1-Oct 1)
   - Winter Cereal Rye - 2 bushels per acre (Aug 1-Oct 15)
   - Oats - 2 bushels per acre (Apr 1-Sept 1)
   - Annual Ryegrass - 20 Pounds per acre (Apr 1-Sept 1)

2) Triazine herbicide carryover will not allow establishment of permanent cover immediately.
   - Forage Sorghum - 1/2 Bushel per acre (May 15-July 15)
   - Sorghum - Sudangrass Hybrid - 1 Bushel per acre (May 15-July 15)
   - Sudangrass - 1 Bushel per acre (May 15-July 15)

DORMANT SEEDING

Seed is broadcast and incorporated, no-tilled, or drilled into the seedbed .
Seedbed preparations and conditions are similar to conventional seeding.

MULCHING

Mulching shall be done immediately after seedbed preparation and seeding.
Mulch shall be applied immediately after final grading for areas seeded at a later date.
Mulch material shall be relatively free of disease, pesticides, chemicals, noxious weed seeds, and other pests and pathogens.

Spread straw and hay mulch uniformly and at the rate of 1.5-2.0 tons per acre (60-70 bales). This application results in a layer of 6 to 7 stems, 1 to 2 inches thick, and provides a minimum 70% ground cover. Some soil surface can be seen after the application. Crimping (disking), wood cellulose fiber, tackifiers, netting, pinning, or other acceptable methods of anchoring will be used if needed to hold the mulch in place.

If other mulch materials are used, the rate of application shall meet the manufacturer's recommendations.

Two (2) tons/ac of 80-89 lime or equivalent from UW-EXT A3671

| Lime Quality | Tons / AC. | Lime Quality | Tons / AC. |
|---|---|---|---|
| 40-49 | 3.9 | 70-79 | 2.3 |
| 50-59 | 3.2 | 90-99 | 1.9 |
| 60-69 | 2.7 | 100+ | 1.6 |

## Strenz, Anthony - NRCS, Monroe, WI

**From:** Isaacson, Michael - FPAC-NRCS, Madison, WI
**Sent:** Friday, November 5, 2021 11:08 AM
**To:** Strenz, Anthony - NRCS, Monroe, WI
**Cc:** Dreischmeier, Mike - NRCS, Richland Center, WI; Vosberg, Janet - NRCS, Richland Center, WI
**Subject:** Hautakker Historic Stream Migration
**Attachments:** Hatakker Historic Stream Migration.xlsx

Tony,
Attached is the historic stream migration for the Hautakker site. You do have some aggressive banks that meet Steve's suggestion of 0.5 ft/year. Surprisingly, the owner is correct, Bank 2 has migrated over 40 ft. I measure 53 ft on the imagery. This analysis of using historic imagery has error, but the rates shown should be within the margin of error.

Our next step is to get the lab results back so we can see what our allowable stresses for the banks. We can then see how your proposed sloping will do. I do like your proposal because the rock size will get large at this site. I think the shaping will help keep costs down for the owner.

I would be happy to go over this with you at your convenience.

**Michael Isaacson, PE**
Hydraulics Engineer, Madison State Office
Natural Resources Conservation Service
United States Department of Agriculture
Office: (608) 662-4422 x291
Cell: (608) 416-0683
www.wi.nrcs.usda.gov
*Stay Connected with USDA:*

Galena River
Bank Recession

11//2021 1998

Source: Google Earth Historic Imagery
11/1/2021 Survey

Distance from Yellow Point (ft)

| Bank | 1998 | 2008 | 2015 | 2021 | Migration Rate (ft/yr) |
|---|---|---|---|---|---|
| 1 | 0 | 8.38 | 7.65 | 20.2 | 0.94 |
| 2 | 0 | 28.06 | 34.63 | 54.23 | 2.34 |
| 3 | 0 | 0 | 10.62 | 10.38 | 0.49 |
| 4 | 0 | 11.04 | 9.4 | 20 | 0.88 |


Bank 1 - 1998
Galena River
Bank 2 - 1998
Galena River
Bank 4 - 1998
Bank 5 - 1998
Image U.S. Geological Survey
Google Earth

1998


Bank 1 - 1998
Galena River
Bank 2 - 1998
Galena River
Bank 4 - 1998
Bank 5 - 1998
Image USDA Farm Service Agency
Google Earth

2008


Bank 1 - 1998
Galena River
Bank 2 - 1998
Galena River
Bank 4 - 1998
Bank 5 - 1998
Google Earth

2015

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

710 Commerce Drive
PO Box 169
Watertown, WI 53094

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

# Total Phosphorus Analysis 04/22/25
## Town and Country Engineering 6659

| Field ID | Sample ID | Total P (ppm) |
|---|---|---|
| Bend 1 | 1 | 564.6 |
| Bend 1 | 2 | 562.9 |
| Bend 1 | 3 | 546.8 |
| Bend 1 | 4 | 505.5 |
| Bend 1 | 5 | 631 |
| Bend 2 | 1 | 539.1 |
| Bend 3 | 1 | 377 |
| Bend 4 | 1 | 569.9 |
| Bend 5 | 1 | 672.9 |
| Bend 5 | 2 | 493.9 |
| Bend 6 | 1 | 505.3 |
| Bend 7 | 1 | 566.3 |
| Bend 7 | 2 | 529.3 |


HOUTAKKER PROJECT
TOP BANK : BEND 1 (2010)
758
756
750
754
752
760
786 788 792
780 782 790
770 772 776 784
764 766 778
758 760 762 768 774
Legend
BEND 1 TOP OF BANK (2010)
2010 CONTOURS
N
0 20 40 80
Feet
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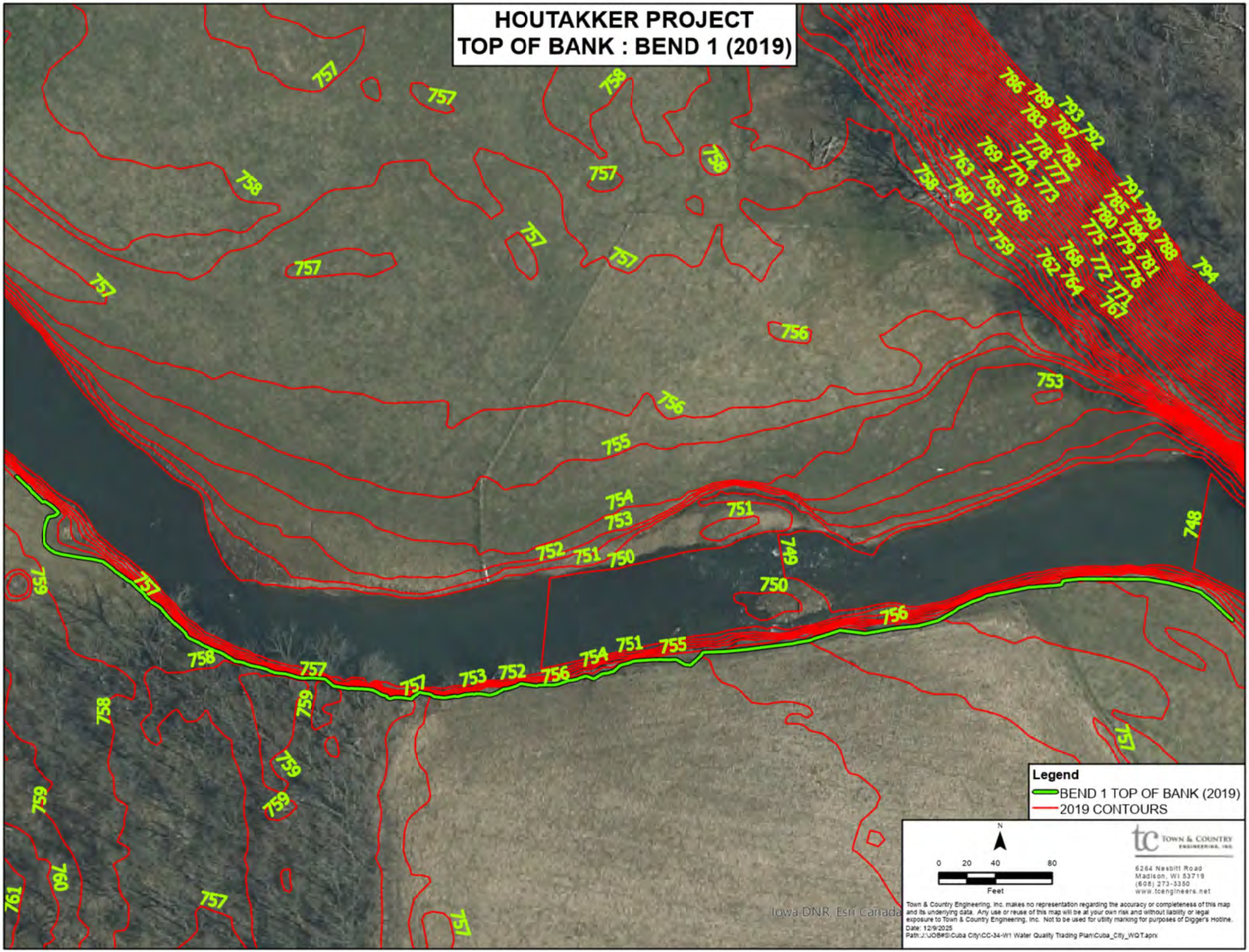
HOUTAKKER PROJECT
TOP OF BANK : BEND 1 (2019)
Legend
BEND 1 TOP OF BANK (2019)
2019 CONTOURS
N
0 20 40 80
Feet
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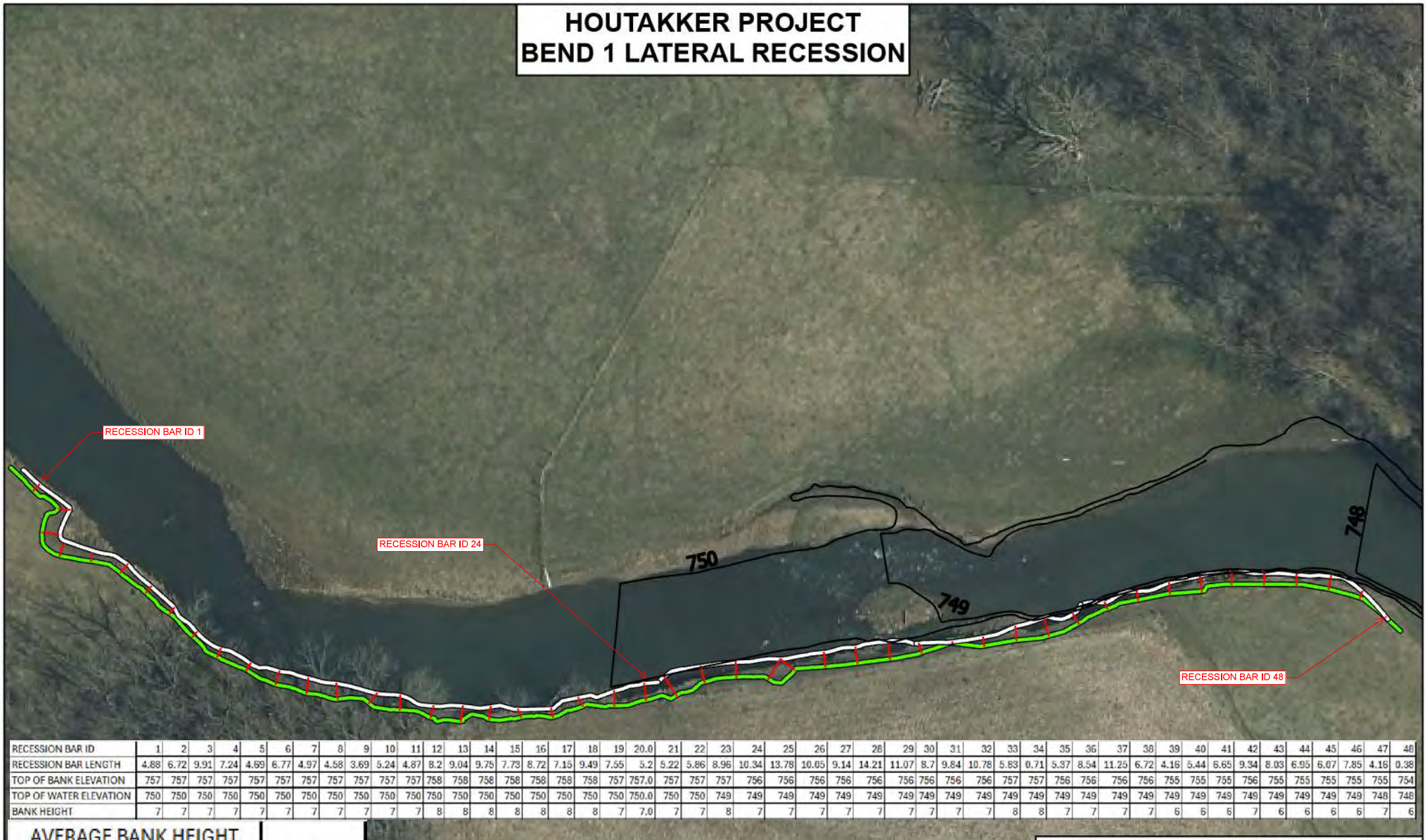
# HOUTAKKER PROJECT
# BEND 1 LATERAL RECESSION




| RECESSION BAR ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20.0 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RECESSION BAR LENGTH | 4.88 | 6.72 | 9.91 | 7.24 | 4.69 | 6.77 | 4.97 | 4.58 | 3.69 | 5.24 | 4.87 | 8.2 | 9.04 | 9.75 | 7.73 | 8.72 | 7.15 | 9.49 | 7.55 | 5.2 | 5.22 | 5.86 | 8.96 | 10.34 | 13.78 | 10.05 | 9.14 | 14.21 | 11.07 | 8.7 | 9.84 | 10.78 | 5.83 | 0.71 | 5.37 | 8.54 | 11.25 | 6.72 | 4.16 | 5.44 | 6.65 | 9.34 | 8.03 | 6.95 | 6.07 | 7.85 | 4.16 | 0.38 |
| TOP OF BANK ELEVATION | 757 | 757 | 757 | 757 | 757 | 757 | 757 | 757 | 757 | 757 | 757 | 758 | 758 | 758 | 758 | 758 | 758 | 758 | 757 | 757.0 | 757 | 757 | 757 | 756 | 756 | 756 | 756 | 756 | 756 | 756 | 756 | 756 | 757 | 757 | 756 | 756 | 756 | 756 | 755 | 755 | 755 | 756 | 755 | 755 | 755 | 755 | 755 | 754 |
| TOP OF WATER ELEVATION | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750.0 | 750 | 750 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 749 | 748 | 748 | 748 |
| BANK HEIGHT | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7.0 | 7 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 7 | 6 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 7 |
| AVERAGE ANNUAL RECESSION (FEET) | 0.81 |

**Legend**

- BEND 1 LATERAL RECESSION TRANSECT BARS
- BEND 1 TOP OF BANK (2010)
- BEND 1 TOP OF BANK (2019)
- BEND 1 TOP OF WATER

N

0 20 40 80

Feet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HOUTAKKER PROJECT
TOP OF BANK : BEND 2 (2010)
792
790
788
786
784
782
780
778
776
774
772
770
768
766
764
762
760
758
756
754
752
750
748
748
750
Legend
BEND 2 TOP OF BANK (2010)
2010 CONTOURS
N
0 5 10 20
Feet
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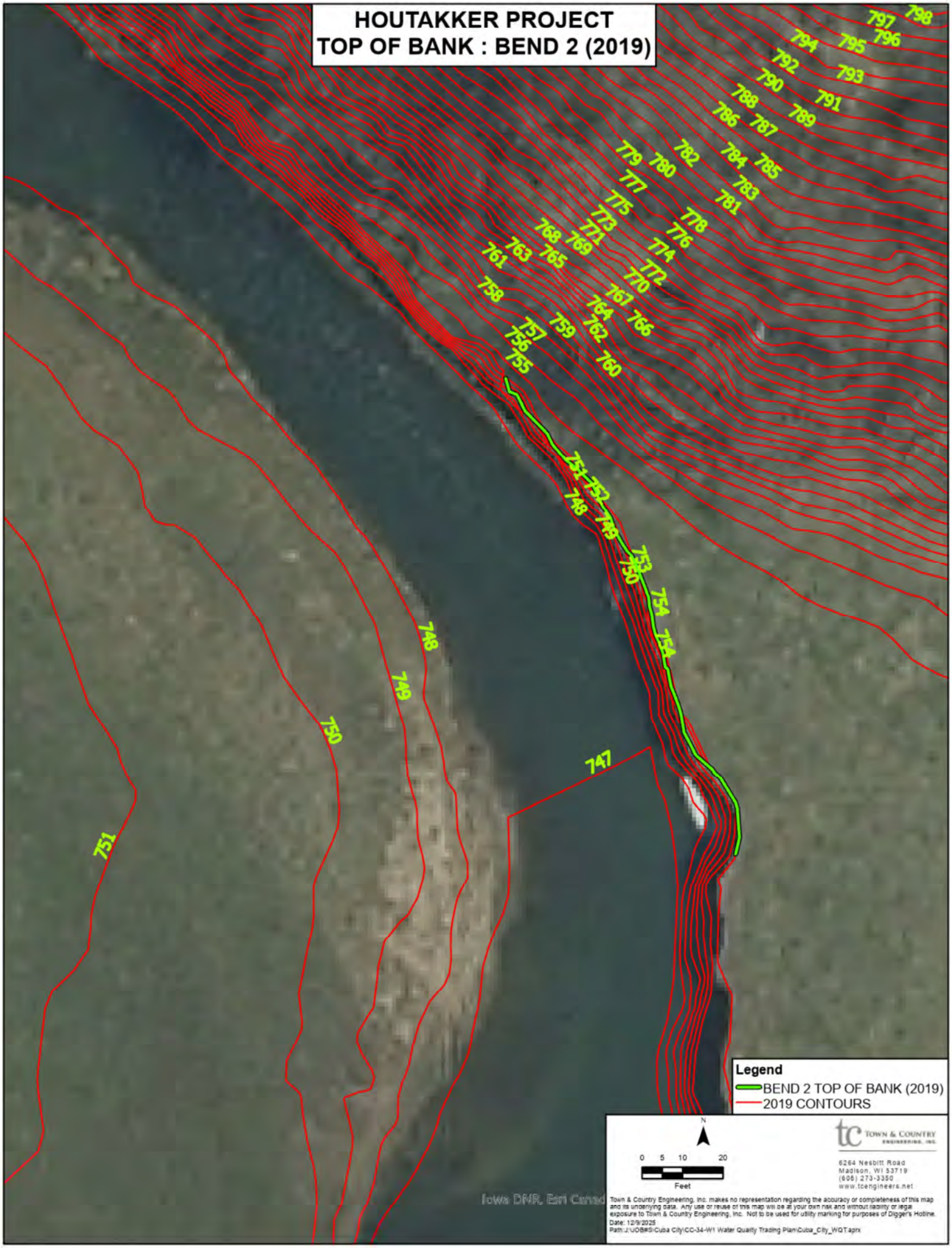
HOUTAKKER PROJECT
TOP OF BANK : BEND 2 (2019)
798
797
796
795
794
793
792
791
790
789
788
787
786
785
784
783
782
781
780
779
778
777
776
775
774
773
772
771
770
769
768
767
766
765
764
763
762
761
760
759
758
757
756
755
754
753
752
751
750
749
748
747
Legend
BEND 2 TOP OF BANK (2019)
2019 CONTOURS
N
0 5 10 20
Feet
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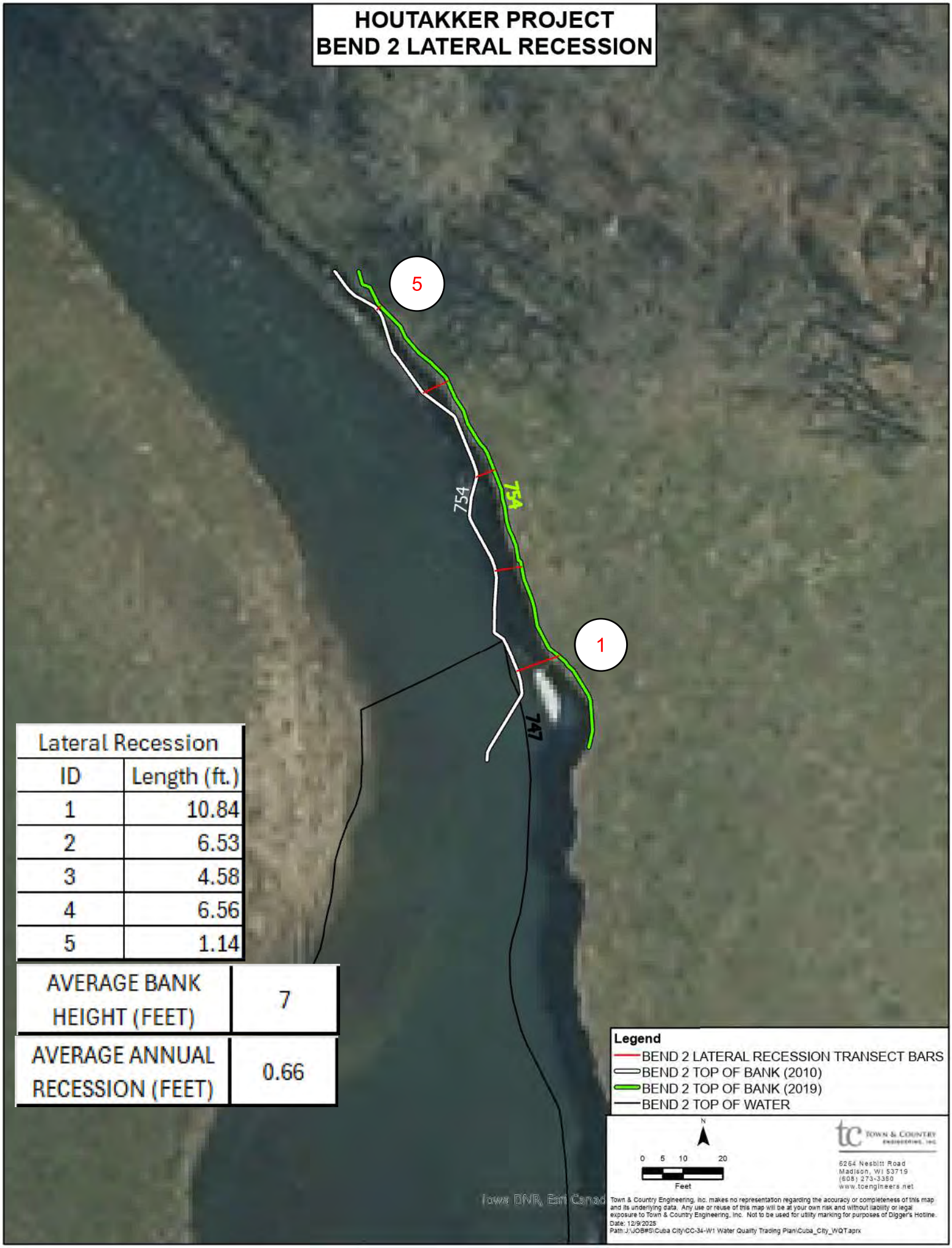
# BEND 2 LATERAL RECESSION




| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 10.84 |
| 2 | 6.53 |
| 3 | 4.58 |
| 4 | 6.56 |
| 5 | 1.14 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 7 |
| AVERAGE ANNUAL RECESSION (FEET) | 0.66 |

**Legend**

- BEND 2 LATERAL RECESSION TRANSECT BARS
- BEND 2 TOP OF BANK (2010)
- BEND 2 TOP OF BANK (2019)
- BEND 2 TOP OF WATER

N

0 5 10 20

Feet

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HOUTAKKER PROJECT
TOP OF BANK : BEND 3 (2010)
758
756
754
754
752
750
748
750
748
752
750
752
Legend
BEND 3 TOP OF BANK (2010)
2010 CONTOURS
N
0 5 10 20
Feet
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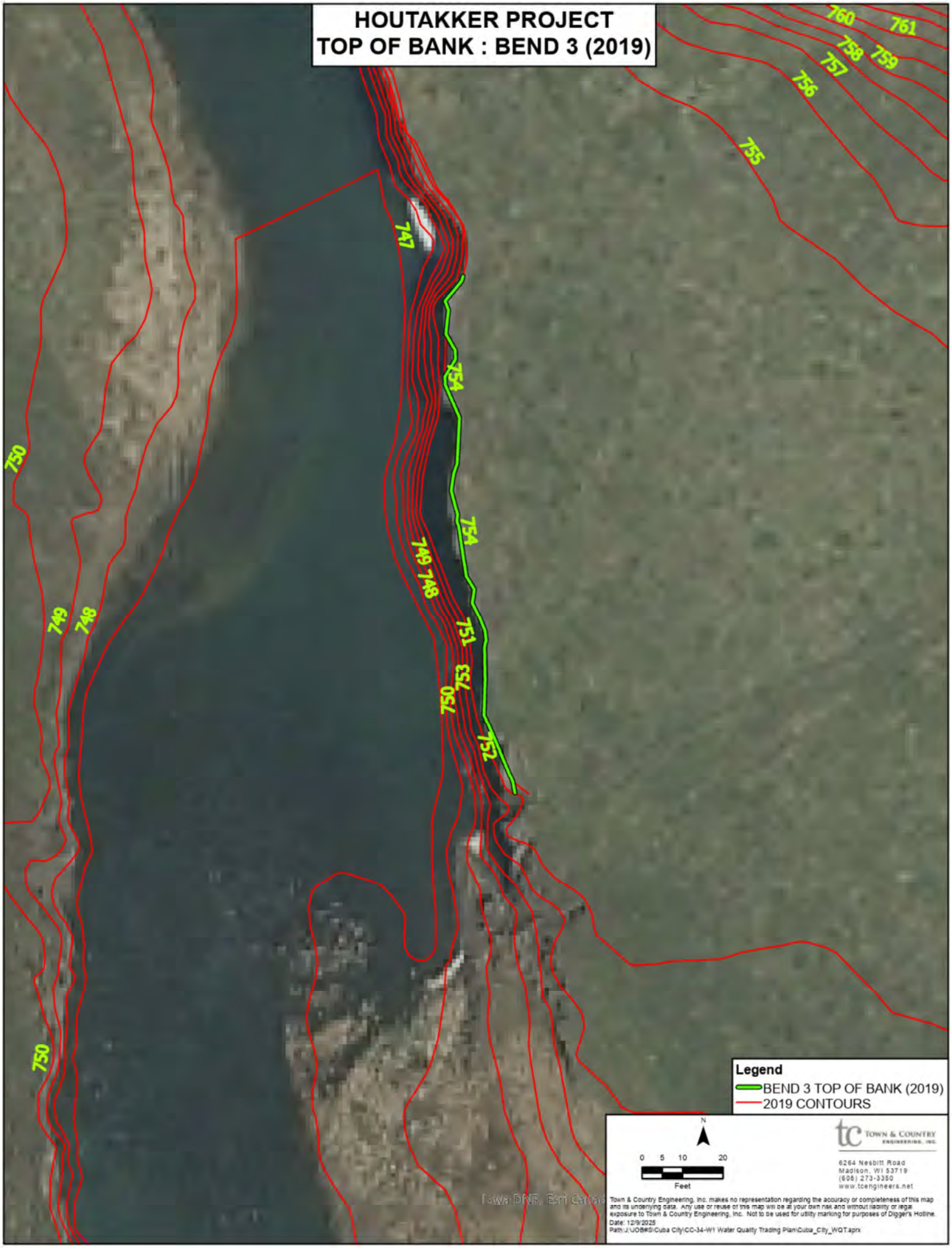
HOUTAKKER PROJECT
TOP OF BANK : BEND 3 (2019)
760
761
758
759
757
756
755
747
754
754
750
749
748
749
748
751
753
750
752
750
Legend
BEND 3 TOP OF BANK (2019)
2019 CONTOURS
N
0 5 10 20
Feet
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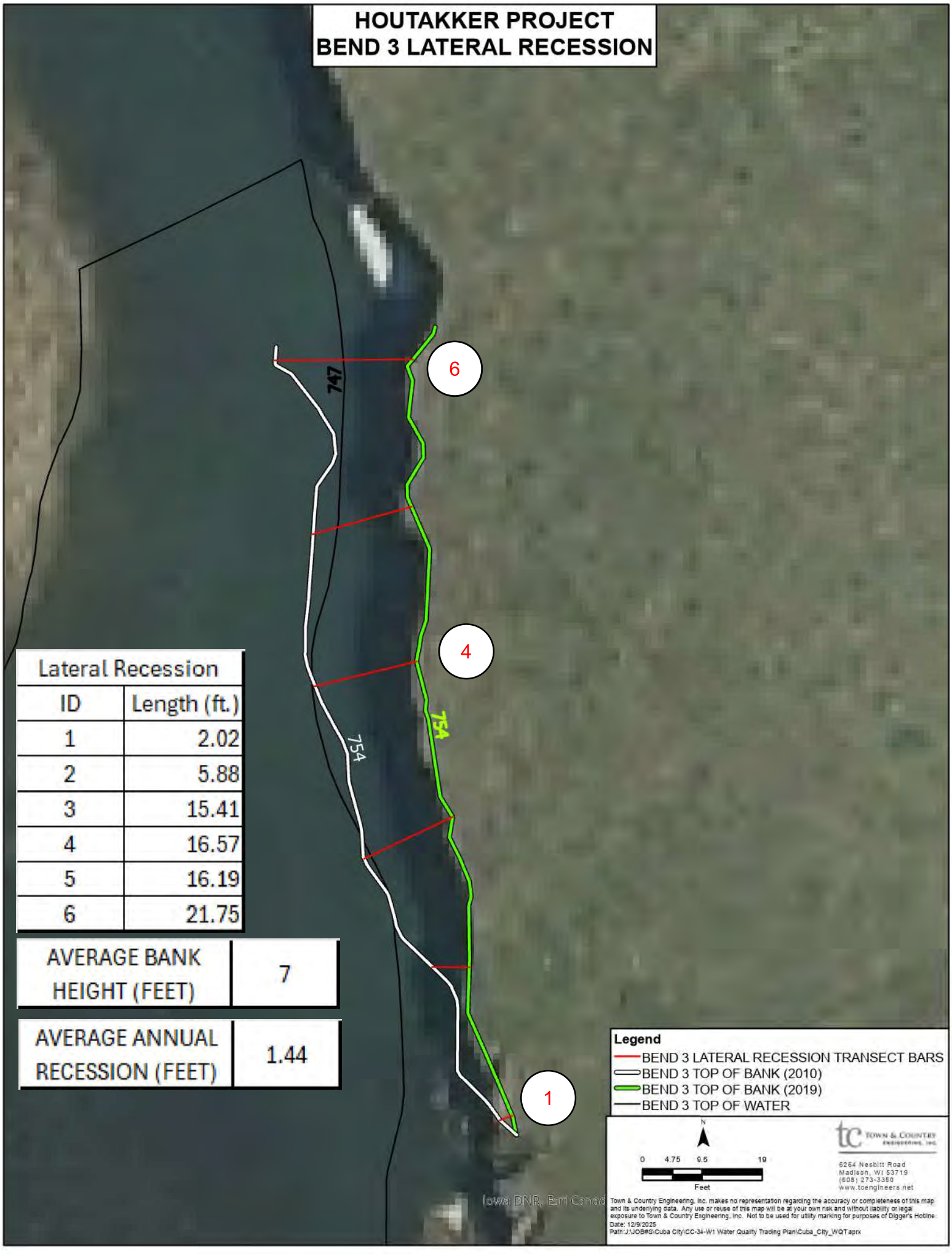
# BEND 3 LATERAL RECESSION




| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 2.02 |
| 2 | 5.88 |
| 3 | 15.41 |
| 4 | 16.57 |
| 5 | 16.19 |
| 6 | 21.75 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 7 |
| AVERAGE ANNUAL RECESSION (FEET) | 1.44 |

**Legend**

- BEND 3 LATERAL RECESSION TRANSECT BARS
- BEND 3 TOP OF BANK (2010)
- BEND 3 TOP OF BANK (2019)
- BEND 3 TOP OF WATER

N

0 4.75 9.5 19

Feet

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HOUTAKKER PROJECT
TOP OF BANK : BEND 4 (2010)
752
754
752
750
748
750
748
752
754
746
Legend
BEND 4 TOP OF BANK (2010)
2010 CONTOURS
N
0 5 10 20
Feet
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HOUTAKKER PROJECT
TOP OF BANK : BEND 4 (2019)
747
751
749
748
747
750
750
747
748
751
752
753
754
Legend
BEND 4 TOP OF BANK (2019)
2019 CONTOURS
N
0 5 10 20
Feet
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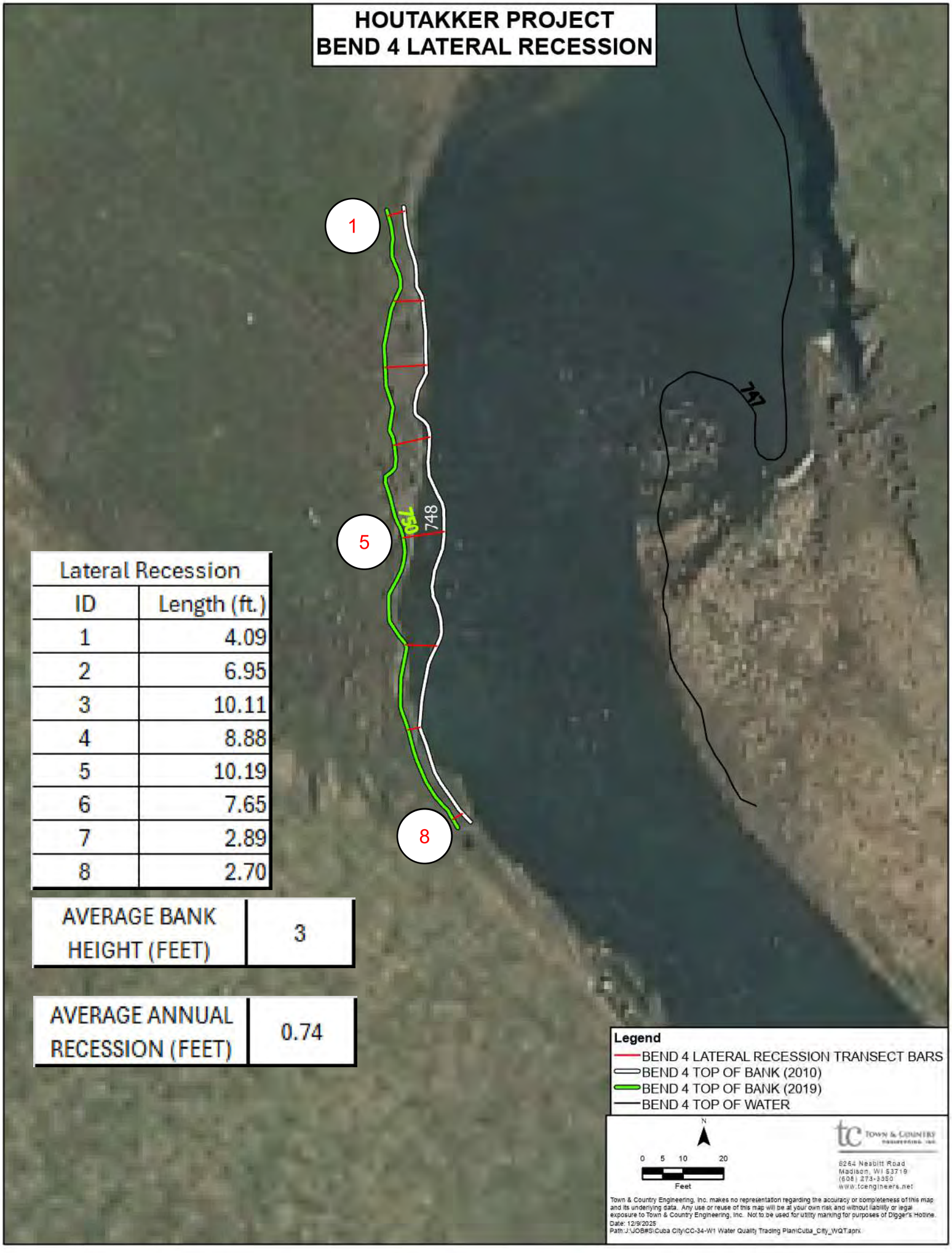
# HOUTAKKER PROJECT
# BEND 4 LATERAL RECESSION




| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 4.09 |
| 2 | 6.95 |
| 3 | 10.11 |
| 4 | 8.88 |
| 5 | 10.19 |
| 6 | 7.65 |
| 7 | 2.89 |
| 8 | 2.70 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 3 |

| | |
|---|---|
| AVERAGE ANNUAL RECESSION (FEET) | 0.74 |

**Legend**

- BEND 4 LATERAL RECESSION TRANSECT BARS
- BEND 4 TOP OF BANK (2010)
- BEND 4 TOP OF WATER
- BEND 4 TOP OF BANK (2019)

N

0 5 10 20

Feet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HOUTAKKER PROJECT
TOP OF BANK : BEND 5 (2010)
752
746
750
748
748
750
752
752
754
754
754
754
Legend
BEND 5 TOP OF BANK (2010)
2010 CONTOURS
N
0 5 10 20
Feet
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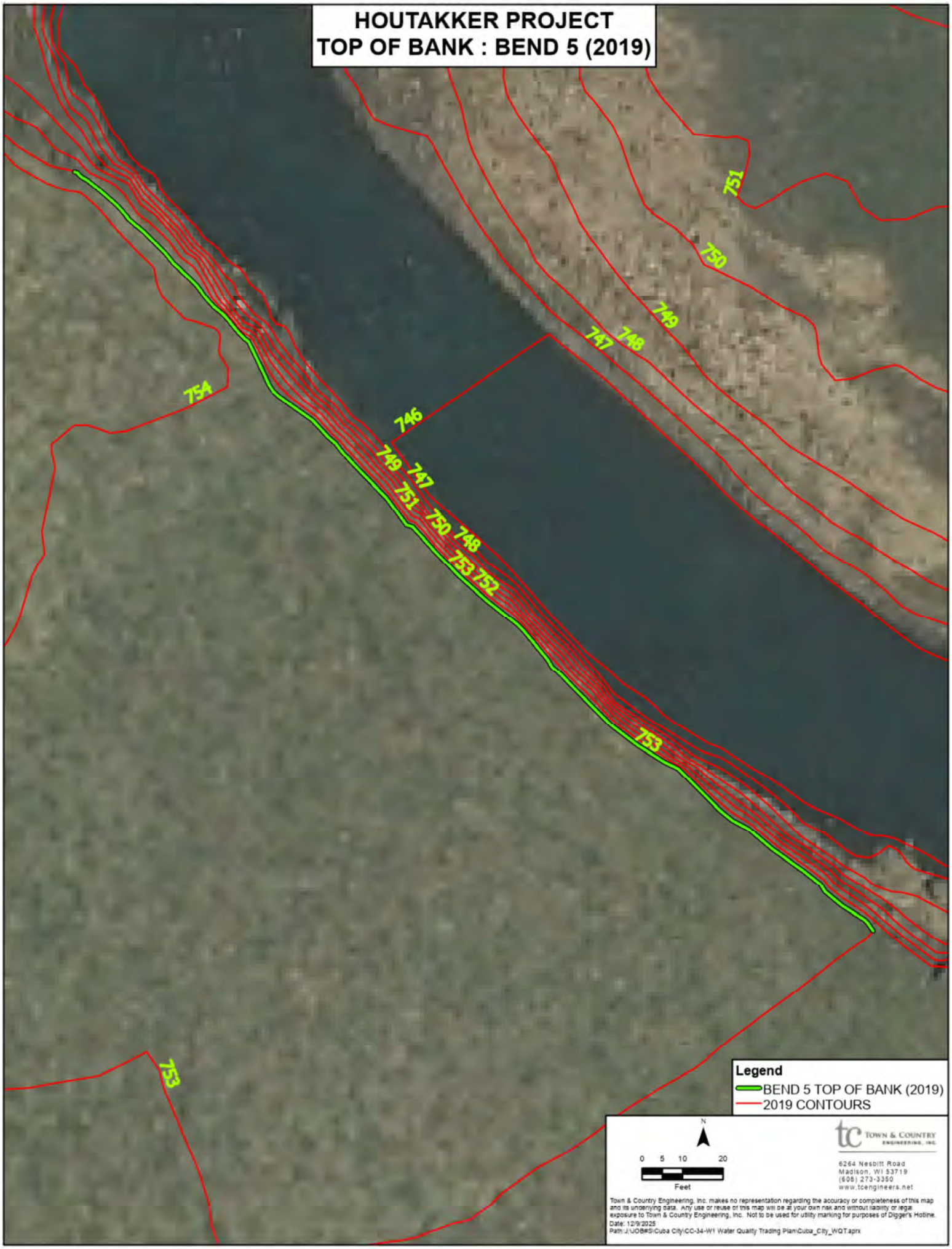
HOUTAKKER PROJECT
TOP OF BANK : BEND 5 (2019)
751
750
749
748
747
754
746
749
747
751
750
748
753
752
753
753
Legend
BEND 5 TOP OF BANK (2019)
2019 CONTOURS
N
0 5 10 20
Feet
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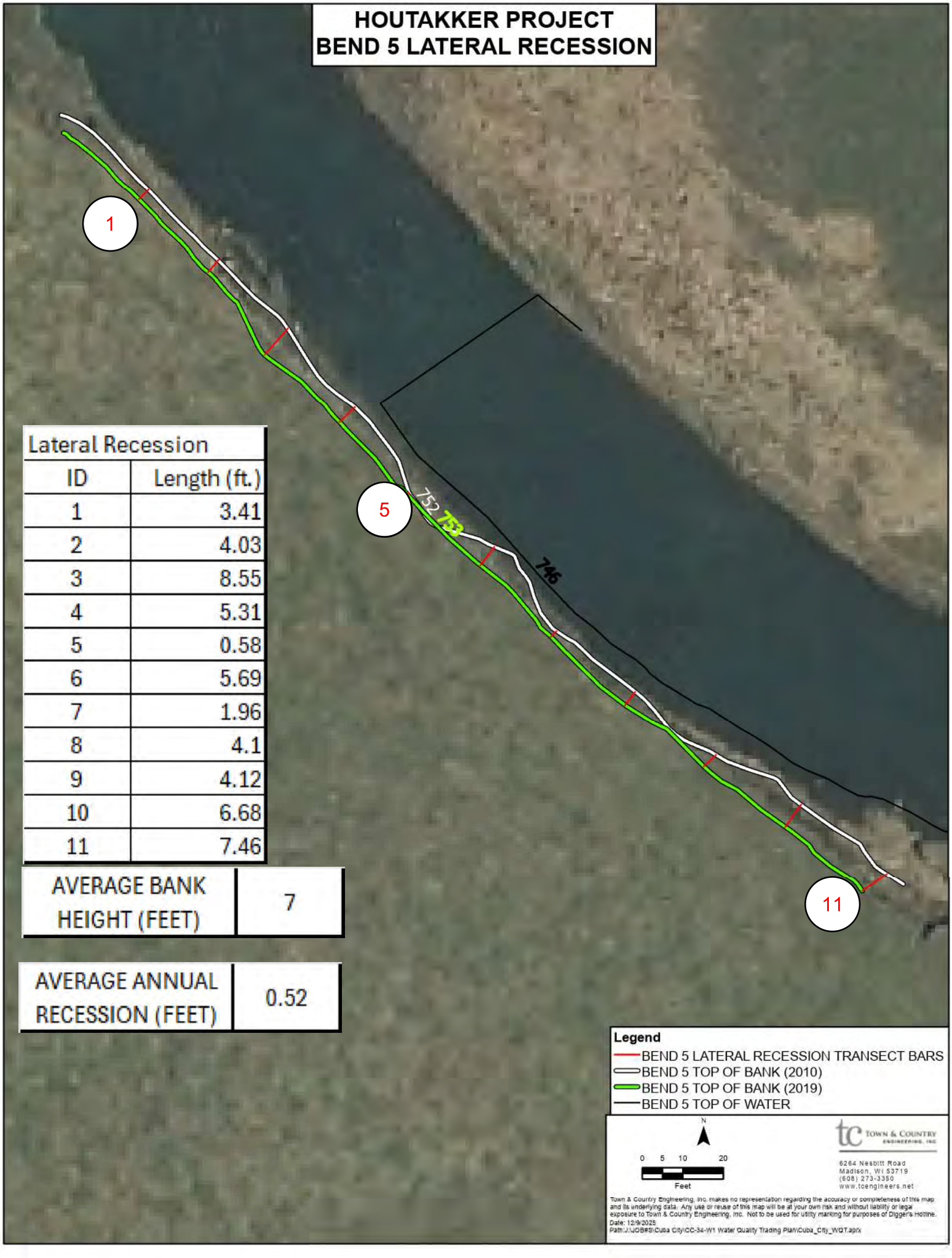
# HOUTAKKER PROJECT
# BEND 5 LATERAL RECESSION




| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 3.41 |
| 2 | 4.03 |
| 3 | 8.55 |
| 4 | 5.31 |
| 5 | 0.58 |
| 6 | 5.69 |
| 7 | 1.96 |
| 8 | 4.1 |
| 9 | 4.12 |
| 10 | 6.68 |
| 11 | 7.46 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 7 |

| | |
|---|---|
| AVERAGE ANNUAL RECESSION (FEET) | 0.52 |

**Legend**

- BEND 5 LATERAL RECESSION TRANSECT BARS
- BEND 5 TOP OF BANK (2010)
- BEND 5 TOP OF BANK (2019)
- BEND 5 TOP OF WATER

N

0 5 10 20

Feet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HOUTAKKER PROJECT
TOP OF BANK : BEND 6 (2010)
754
746
748
750
752
752
752
746
748
750
Legend
BEND 6 TOP OF BANK (2010)
2010 CONTOURS
N
0 5 10 20
Feet
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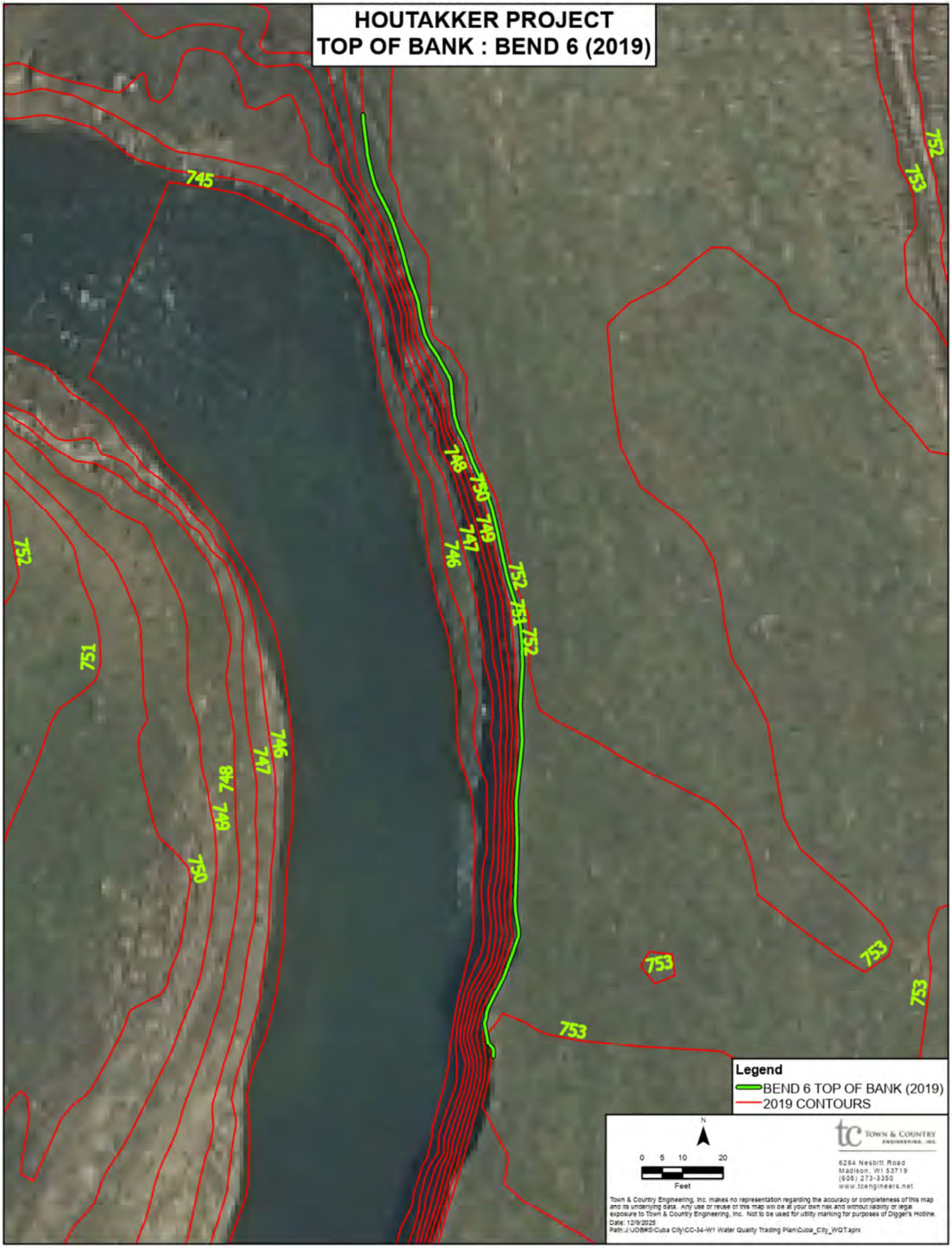
HOUTAKKER PROJECT
TOP OF BANK : BEND 6 (2019)
745
752
753
748
750
749
747
746
751
Legend
BEND 6 TOP OF BANK (2019)
2019 CONTOURS
N
0 5 10 20
Feet
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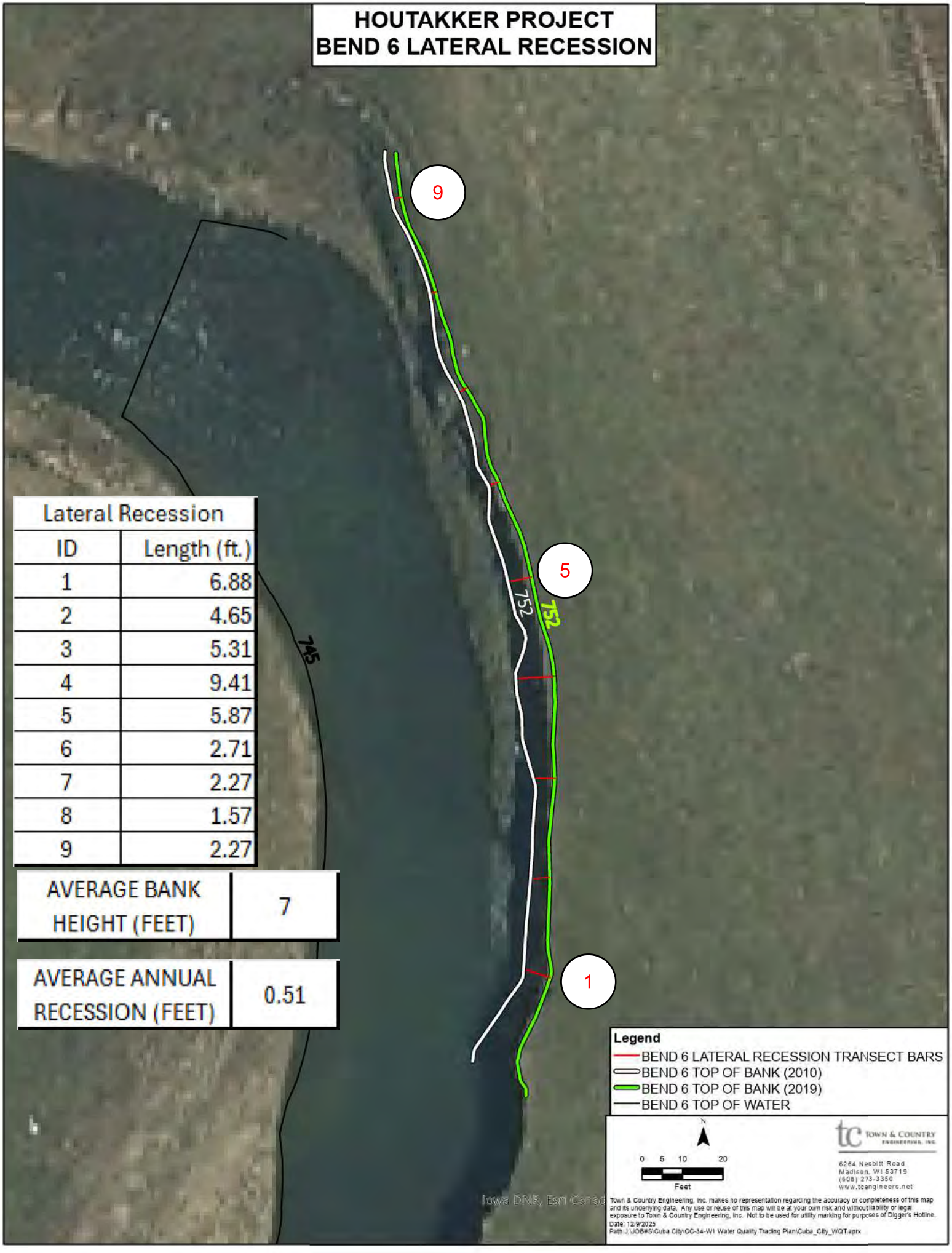
# HOUTAKKER PROJECT
# BEND 6 LATERAL RECESSION




| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 6.88 |
| 2 | 4.65 |
| 3 | 5.31 |
| 4 | 9.41 |
| 5 | 5.87 |
| 6 | 2.71 |
| 7 | 2.27 |
| 8 | 1.57 |
| 9 | 2.27 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 7 |

| | |
|---|---|
| AVERAGE ANNUAL RECESSION (FEET) | 0.51 |

**Legend**

- BEND 6 LATERAL RECESSION TRANSECT BARS
- BEND 6 TOP OF BANK (2010)
- BEND 6 TOP OF BANK (2019)
- BEND 6 TOP OF WATER

N

0 5 10 20

Feet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HOUTAKKER PROJECT
TOP OF BANK : BEND 7 (2010)
750
748
746
750
748
750
746
750
748
752
Legend
BEND 7 TOP OF BANK (2010)
2010 Contours
N
0 5 10 20
Feet
Iowa DNR, Esri Canada
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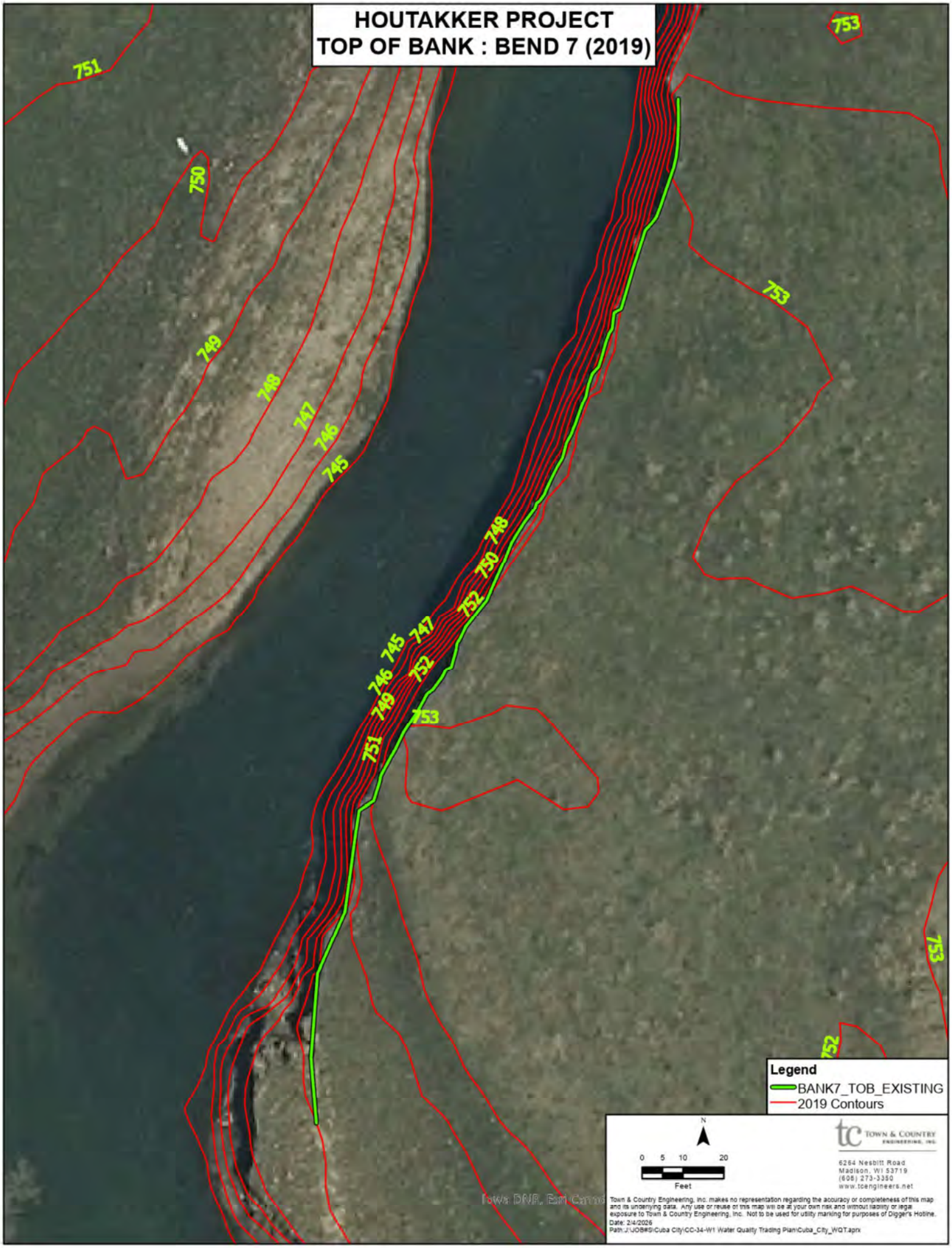
HOUTAKKER PROJECT
TOP OF BANK : BEND 7 (2019)
751
750
749
748
747
746
745
753
748
750
752
747
745
752
746
749
753
751
753
753
752
Legend
BANK7_TOB_EXISTING
2019 Contours
N
0 5 10 20
Feet
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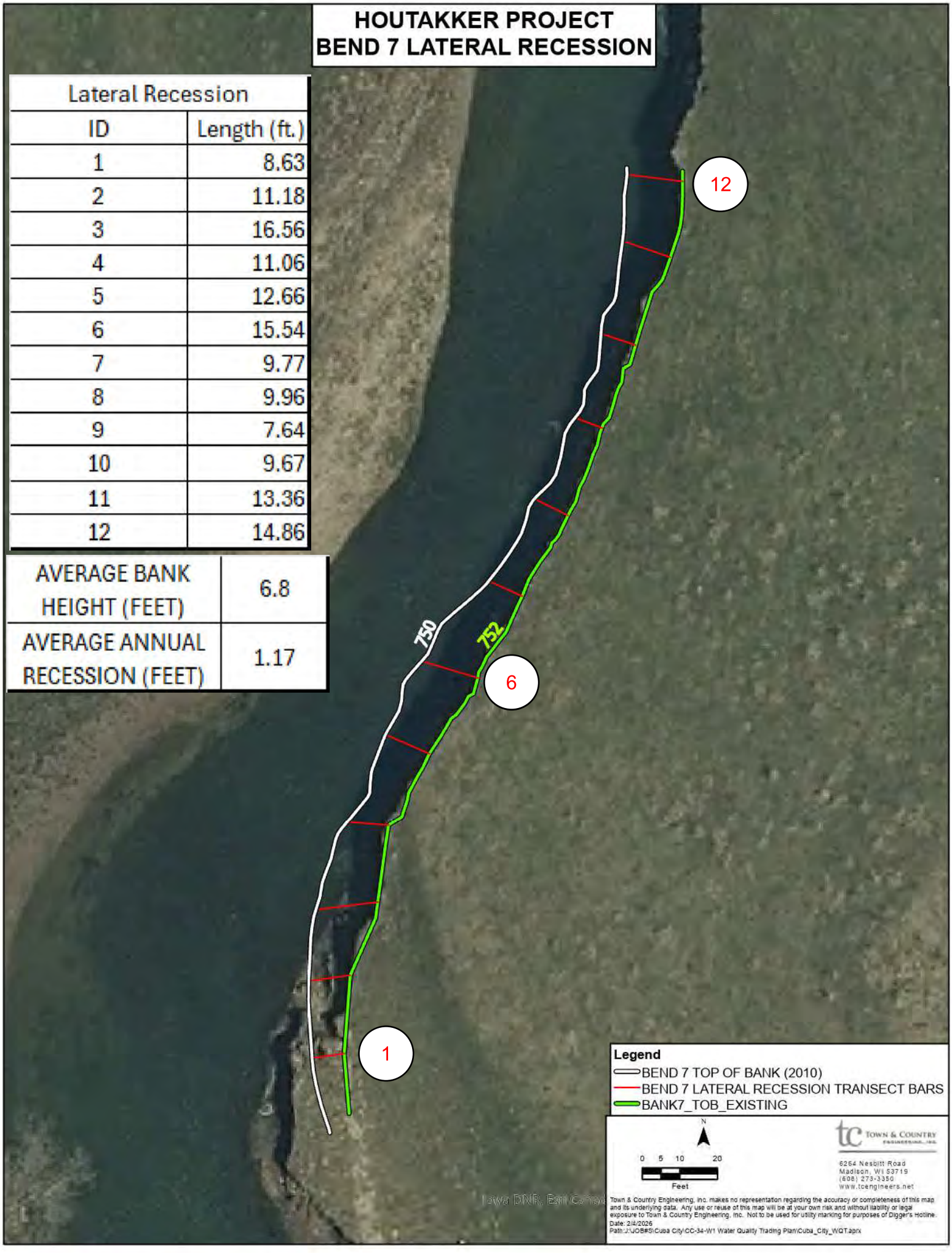
# HOUTAKKER PROJECT
# BEND 7 LATERAL RECESSION

| Lateral Recession | |
|---|---|
| ID | Length (ft.) |
| 1 | 8.63 |
| 2 | 11.18 |
| 3 | 16.56 |
| 4 | 11.06 |
| 5 | 12.66 |
| 6 | 15.54 |
| 7 | 9.77 |
| 8 | 9.96 |
| 9 | 7.64 |
| 10 | 9.67 |
| 11 | 13.36 |
| 12 | 14.86 |

| | |
|---|---|
| AVERAGE BANK HEIGHT (FEET) | 6.8 |
| AVERAGE ANNUAL RECESSION (FEET) | 1.17 |



## NRCS Streambank Erosion Estimator (Direct Volume Method)

Farmer / Cooperator Name: DAVID HAUTAKKER
Tract Number:

Evaluated By: PETER RIDDLE
Evaluation Date: February 4, 2026

| Field Number | Eroding Streambank Reach Number | Eroding (Feet) | Eroding k Height * (Feet) | Area of Eroding Streambank ($FT^2$) | Lateral Recession Rate (Estimated) (FT / Year) | Estimated Volume ($FT^3$) Eroded Annually | Soil Texture | Approximate Pounds of Soil per $FT^3$ | Estimated Soil Loss (Tons/Year) | % P | POUNDS P | POUNDS P (ROUNDED) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEND 1 RR | BEND 1 | 975.0 | 7.0 | 6,825 | 0.81 | 5,528.3 | Silt Loam | 95 | 262.6 | 0.0562 | 295.1533 | 295.15 |
| BEND 2 RR | BEND 2 | 130.0 | 7.0 | 910 | 0.66 | 600.6 | Silt Loam | 95 | 28.5 | 0.0539 | 30.75372 | 30.75 |
| BEND 3 RR | BEND 3 | 160.0 | 7.0 | 1,120 | 1.44 | 1,612.8 | Silt Loam | 95 | 76.6 | 0.0377 | 57.76243 | 57.76 |
| | | | | Total Estimated Annual Streambank Erosion Soil Loss (Tons): | | | | | 367.7 | | | |

| Field Number | Eroding Streambank Reach Number | Eroding (Feet) | Eroding k Height * (Feet) | Area of Eroding Streambank ($FT^2$) | Lateral Recession Rate (Estimated) (FT / Year) | Estimated Volume ($FT^3$) Eroded Annually | Soil Texture | Approximate Pounds of Soil per $FT^3$ | Estimated Soil Loss (Tons/Year) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEND 4 RR | BEND 4 | 185.0 | 3.0 | 555 | 0.74 | 410.7 | Silt Loam | 95 | 19.5 | 0.057 | 22.23941 | 22.24 |
| BEND 5 SH | BEND 5 | 330.0 | 7.0 | 2,310 | 0.51 | 1,178.1 | Silt Loam | 95 | 56.0 | 0.0583 | 65.24907 | 65.25 |
| BEND 6 SH | BEND 6 | 240.0 | 7.0 | 1,680 | 0.51 | 856.8 | Silt Loam | 95 | 40.7 | 0.0503 | 40.94219 | 40.94 |
| | | | | Total Estimated Annual Streambank Erosion Soil Loss (Tons): | | | | | 116.2 | | | |

| Field Number | Eroding Streambank Reach Number | Eroding (Feet) | Eroding k Height * (Feet) | Area of Eroding Streambank ($FT^2$) | Lateral Recession Rate (Estimated) (FT / Year) | Estimated Volume ($FT^3$) Eroded Annually | Soil Texture | Approximate Pounds of Soil per $FT^3$ | Estimated Soil Loss (Tons/Year) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEND 7 RR | BEND 7 | 280.0 | 6.8 | 1,890 | 1.17 | 2,211.3 | Silt Loam | 95 | 105.0 | 0.055 | 115.5404 | 115.54 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | Total Estimated Annual Streambank Erosion Soil Loss (Tons): | | | | | 105.0 | | | |

| Total Estimated Annual Streambank Erosion Soil Loss (Tons): | 588.9 |
|---|---|

| TOATAL P | 627.63 |
|---|---|

*POUNDS CALCULATED AS (%P)(TONS)(2000)/100

* Eroding bank height is measured along the bank, not the vertical height of bank.

*Streambank Erosion Calculation Formula:*

$$\frac{\text{Eroding Bank } \underline{\textbf{Length}} \times \text{Eroding Bank } \underline{\text{Height}} \times \underline{\text{Lateral Recession Rate}}\ (\text{FT/YR}) \times \underline{\text{Soil Weight}}\ (\text{lbs/ft}^3)}{2000} = \underline{\textbf{Estimated}}\ \text{Soil Loss Per Year (Tons/yr)}$$

| Total Pound of Phosphorus Reduction | 627.63 |
|---|---|
| Total WQT Credits after Trade Ratio (2.1:1) | 299 |