

Engineering Report

Water Quality Trading Plan

Prepared For

VPP GROUP, LLC
NORWALK | WISCONSIN

REVISED: OCTOBER 4, 2018
REVISED: SEPTEMBER 19, 2018
REVISED: SEPTEMBER 7, 2018
AUGUST 16, 2017

McM. No. V0948-9-17-00615

Prepared By

CHAD T. OLSEN, P.E., BCEE

McMAHON
ENGINEERS ARCHITECTS

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McMAHON ASSOCIATES, INC.
NEENAH, WISCONSIN

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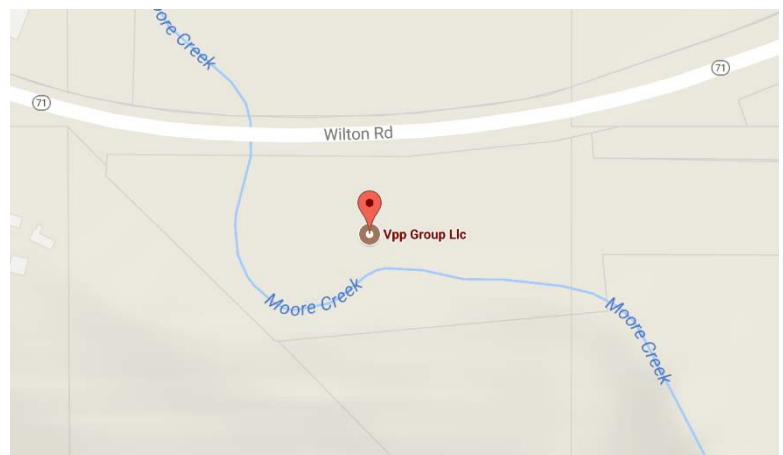
I. EXECUTIVE SUMMARY

This Water Quality Trading Plan details VPP Group, LLC's (referred to hereafter as 'VPP') plan to comply with their Total Phosphorus (TP) Water Quality-Based Trading Effluent Limitation (WQBEL), as specified in their Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0052931-08-0. VPP intends to work with the Monroe County Land Conservation Department (referred to hereafter as the 'County') to undertake a stream bank restoration project at Moore Creek to generate Phosphorus (P) credits for Water Quality Trading (WQT). The County will design improvements and bid out construction work on behalf of VPP. VPP or Monroe County will hire a contractor for the project.

II. BACKGROUND

The Moore Creek runs eastwards, and is located southwest of the VPP facility. The banks of the river are not used for any purpose at this time. Figure II-1 illustrates the location of Moore Creek relative to the VPP facility.

Figure II-1: Location Of Moore Creek Relative To VPP



Under VPP’s current WPDES permit, a 6-month average TP limit of 0.075 mg/L will need to be met during the next Permit term.

VPP will, more than likely, not be able to consistently meet the TP limit with their existing facilities. The effluent data from the past 2.5-years is summarized in Table II-1. During the period of May 2015 to October 2015, the effluent TP exceeded the WQBEL for P. As such, acquiring credits to Trade to offset their P effluent discharge will allow them to achieve compliance.

Table II-1: 6-Month Avg. Effluent P (May 2015 - April 2017)

Time Period	Avg. Effluent P	Avg. Effluent TP
	mg/L	lbs./day
May 2015 - October 2015	0.141	0.065
November 2015 - April 2016	0.073	0.034
May 2016 - October 2016	0.053	0.023
November 2016 - April 2017	0.055	0.026

VPP intends to acquire credits by reducing the soil erosion from a non-point source, which has been identified as the banks of the Moore Creek located southwest of the facility. By designing improvements to the stream bank, the reduction in soil erosion subsequently leads to less P being leached into the Creek. This reduction will generate the required credits for compliance. VPP owns the rights to the land adjacent to the Creek, south of Wilton Road, which will allow them to perform the necessary modifications to reduce soil erosion.



Figure II-2: Streambank Segments

VPP partnered with the County for this project. Soil samples were collected on August 10, 2018 from potential degradation sites along the bend in the riverbank, located southwest of the facility. A copy of the results is included in Appendix #2. The results revealed the concentration of P in the soil, which was used to calculate the amount of P that could be saved by reducing erosion. It was determined that improving the south bank of Bank Segment #3 would be sufficient to generate the required pollutant reduction credits. Once the project is installed, it will be maintained perpetually and keep providing credits in the future.

Figure II-2 illustrates various stream segments that could be restored, with Bank Segment #3 highlighted in the yellow box.

Table II-2 shows the calculation for yearly P losses due to erosion of Bank Segment #3. This is based on the NRCS erosion calculator combined with soil P concentration.

Table II-2: Projected P Loss From Erosion Of Stream Banks

Bank Segment	Length	Width	Erosion Rate	Volume Loss	Mass Loss	Soil P Conc.	P Loss
	feet	feet	feet/yr.	cu.ft./yr.	tons/yr.	%	lbs./yr.
#3	300	6.0	0.50	900	49.5	0.03	29.7
Est. Soil Weight, lbs./cu.ft.			110				
Soil Texture: Gravel							

The stream bank lateral recession rate was determined by the County using NRCS guidance included in Appendix #3.

III. TRADE RATIO

WQT must result in an improvement in water quality. As such, the Department Of Natural Resources (DNR) established a Trade ratio that determines the number of credits that must be generated for a WQT. The Trade ratio equation is:

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

A discussion of each factor is considered below:

A. Delivery Factor

The Delivery Factor accounts for the distance between Trading partners and the impact the distance has on the transport of traded pollutant in surface waters. As both the credit generator and VPP are located in the same HUC-12 watershed, the Delivery Factor equals 0.

B. Downstream Trading Factor

A Downstream Trading Factor is needed when the credit generator is located downstream from the credit user's point of standards application. Since bank is located upstream of VPP's point of discharge, Downstream Trading Factor equals 0.

C. Equivalency Factor

The Equivalency Factor accounts for Trading partners discharging different forms of a pollutant. The restoration project would directly result in a reduction of P concentration into the river; thus, the Equivalency Factor equals 0.

D. Uncertainty Factor

The Uncertainty Factor compensates for the multiple sources of uncertainty that occur in the generation of credits by non-point sources. The County proposes to conduct a stream

bank restoration project that will contribute to aquatic habitat restoration. Looking at Table 4, Page 20, of the *Guidance for Implementing Water Quality Trading* in WPDES Permits published by the Wisconsin DNR, this corresponds with an Uncertainty Factor of 2.

E. Aquatic Habitat Adjustment Factor

By reducing soil erosion, the aquatic habitat will be improved and have increased water quality. The reach of stream that encompasses the 900 lin.ft. of eroding stream bank consists of runs that have a small 3 to 4-inch cobble bottom, and pools are primarily silt and sand. There is very little habitat within this reach due to vertical banks without vegetation, pool depth is not adequate to provide depth protection from predators and very little woody habitat is available. There are a few trees overhanging the water and one root wad that could provide some cover. Overall depth is the limiting factor on the entire reach.

This factor is accounted for in the Uncertainty Factor; thus, the Aquatic Habitat Adjustment Factor is 0.

Therefore, equating all these factors: **Trade Ratio = (0 + 0 + 0 + 2 - 0):1 = 2:1**

F. Credits Required

The effluent TP for May 2015 to October 2015 was recorded as 0.065 lbs./day. To determine the credits required, the allowable discharge as stipulated by the WPDES is calculated as shown.

$$\begin{aligned} \text{Allowable Limit} &= 0.055 \text{ mgd} * 8.34 * 0.075 \text{ mg/L} \\ &= 0.034 \text{ lbs./day} \end{aligned}$$

Where 8.34 is a conversion factor to convert to lbs./day.

The total amount of P required for Trading is:

$$\begin{aligned} \text{P Required For Trading} &= (0.065 - 0.034) \text{ lbs./day} * 365 \text{ days/year} \\ &= 11.3 \text{ lbs./year} \end{aligned}$$

Including a safety factor of 1.2, the required P for Trading is 13.5 lbs./year, rounded up to 14 lbs./year. Applying the Trade ratio, the required P credits are:

$$\begin{aligned} \text{P Credits Required} &= \text{P Required For Trading} * \text{Trade Ratio} = 14 \text{ lbs./year} * 2 \\ &= 28 \text{ lbs./year} \end{aligned}$$

Referring to Table II-2, by stabilizing Stream Segment Area #3, the amount of P saved would be 29.7 lbs./year, which meets the 28 lbs./year criteria.

G. Schedule For Stream Bank Restoration

The project will be implemented in the fall of 2018 or early 2019.

H. Operation & Maintenance Of The Stream Bank Restoration

The stream bank restoration project will be maintained per the recommendations of the County. A copy of the Draft Operation & Maintenance Plan is included at the end of Appendix #4.

I. Inspection & Reporting

1. **Monthly Certification:**

Each month, VPP will certify that the stream bank restoration project is operated and maintained in a manner consistent with this Water Quality Trading Plan. Such a certification may be made by including the following statement as a comment on the Monthly Discharge Monitoring Report:

I certify that management practices identified in the approved Water Quality Trading Plan as the source of pollutant reduction credits are installed, established and properly maintained.

2. **Inspections:**

a. VPP will observe the restoration project annually to confirm the practice is still in place. VPP Group will also observe the restoration project after flood events.

b. The DNR will have the right to access and inspect the stream bank.

3. **Annual Water Quality Trading Report:**

When WQT is being used to demonstrate compliance with WQBEL's, VPP shall report to the DNR by January 31st of each year with the following information:

a. The number of pollutant reduction credits (lbs./month) used each month of the previous year to demonstrate compliance;

b. The summary of the annual inspection of the stream bank and the status of the project;

c. Identification of non-compliance or failure to implement any terms or conditions of WPDES Permit No. WI-0052931-08-0 with respect to WQT that have not been reported in discharge monitoring reports.

4. Reporting:

- a. VPP shall notify the DNR within 7-days in the event that the stream bank restoration project does not generate the pollutant reduction credits as defined in the Water Quality Trading Plan.
- b. VPP shall provide the DNR written notice within 7-days of the Trade Agreement upon which the approved Water Quality Trading Plan is being amended, modified or revoked. This notification shall include the details of any amendment or modification, in addition to the justification for the change.

J. Practice Registration Documents

A copy of the Draft Streambank Restoration Plan proposed by Monroe County is included in Appendix #4. Please note that VPP Group, LLC only intends to implement the restoration on Stream Bank Segment #3.

A Water Quality Trading (WQT) Agreement is in place between Crockett County Cattle, LLC and VPP Group, LLC. Crockett County Cattle, LLC and VPP Group, LLC are under the same ownership. Crockett County Cattle, LLC owns all the properties of the Owner's facilities. This Agreement requires Operation & Maintenance (O&M) and inspections of the streambank restoration to be carried out.

Appendix #1

WATER QUALITY TRADING CHECKLIST
Form 8700

State of Wisconsin
 Department of Natural Resources
 101 South Webster Street
 Madison, WI 53707

Water Quality Trading Checklist
 Form 8700-nnn (R10/12)

Applicant Information

Permittee Name <u>VPP Group, LLC</u>		Permit Number <u>WI-0052931-08-0</u>		Facility Site Number <u>Unknown</u>	
Facility Address <u>19801 Highway 71 East</u>			City <u>Norwalk</u>		State <u>WI</u>
Project Contact Name(if applicable) Address			City		State
					Zip Code <u>54648</u>
Project Name					

Receiving Water Name <u>Moore Creek</u>	Parameter(s) being traded <u>Total Phosphorus</u>	HUC 12 <u>070700060102</u>
--	--	-------------------------------

Credit Generator Information

Credit generator type (check all that apply):

<input type="checkbox"/> Permitted Discharge (non-MS4)	<input type="checkbox"/> Non-permitted urban discharge
<input type="checkbox"/> Permitted MS4	<input type="checkbox"/> Agricultural nonpoint source discharge
<input type="checkbox"/> CAFOs	<input checked="" type="checkbox"/> Other- Specify: <u>Stream Bank Restoration</u>

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

Are any of the credit generators downstream of the applicant? Yes
 No

Was a broker/exchange be used to facilitate trade? Yes (include description and contact information in WQT plan)
 No

Permitted Discharge Information (Traditional Municipal/Industrial Discharge, MS4, CAFO):

Are each of the point sources identified in this section are in compliance with their WDPES permit requirements? Yes
 No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				

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

Non-Permitted Discharge Information (Non-permitted urban, agricultural, other):

Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input checked="" type="checkbox"/> Other	Stream Bank Restoration	NRCS erosion calculator combined with Soil P Concentration	N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part
<input type="checkbox"/> Urban NPS <input type="checkbox"/> Agricultural NPS <input type="checkbox"/> Other				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Only in part

Does plan have a narrative that describes:			Plan Section
a.	Description of existing land uses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
b.	Management practices used to generate credits	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
c.	Amount of credit being generated	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
d.	Description of applicable trade ratio per agreement/management practice	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3
e.	Timeline for credits and agreements	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5
f.	Method for quantifying credits	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
g.	Tracking procedures	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7b
h.	Conditions under which the management practices may be inspected	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7b
i.	Reporting requirements should the management practice fail	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7d
j.	Operation and maintenance plan for each management practice	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7a
k.	Location of credit generator in proximity to receiving water and credit user	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
l.	Practice registration documents, if available	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8
m.	History of project site(s)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2
n.	Other: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	

The preparer and owner certify 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
-----------------------	-------------

Appendix #2

SOIL SAMPLE RESULTS

SOIL and FORAGE ANALYSIS LABORATORY

2611 Yellowstone Drive, Marshfield WI 54449
Phone 715-387-2523 ext 11

University of
Wisconsin
Madison/Extension

Corina Turriff
VPP Group LLC
PO Box 227
Norwalk WI 54648

Date 8/23/18
Account # 558790
Report # 4253

Soil Analysis

Sample ID	P nitric/peroxide %
1	0.03
2	0.04
3	0.03
4	0.03

Chad Olsen

From: Bryce Richardson <Bryce.Richardson@co.monroe.wi.us>
Sent: Wednesday, September 5, 2018 8:59 AM
To: Chad Olsen
Subject: RE: FW: Soil Total P Report 4253

Chad,

The 4 soil samples were taken on the following banks.

Bank #1 Sample #1
Bank #2 Sample #2 and #3 due to length of the bank.
Bank #3 Sample #4

All banks were very similar in height and rate of erosion so I combined the banks when calculating the soil loss on the spreadsheet.

From: Chad Olsen [mailto:COlsen@mcmgrp.com]
Sent: Monday, September 03, 2018 12:18 PM
To: Bryce Richardson
Cc: Bob Micheel; steve turriff; Paul Much; Nolan Knapp
Subject: FW: FW: Soil Total P Report 4253

Bryce,

Please see attached and email below to Bob Micheel. It looks like Bob is out till the 14th. Did you help with this project? Would you have time to talk tomorrow?

Thank you
Chad Olsen
McMahon
(920) 751-4200

From: Chad Olsen
Sent: Monday, September 3, 2018 12:14 PM
To: 'Bob Micheel'
Cc: 'steve turriff'; Paul Much; Nolan Knapp
Subject: RE: FW: Soil Total P Report 4253

Bob,

We need to submit an updated Trading Plan to DNR for VPP this week. I am having a hard time following your calcs below. How do the four soil samples (attached) correlate with the 3 stream segments in your Plan?

Do all three segments have the same eroding bank height and lateral recession rate? Please let me know if you have time to talk on Tuesday.

Thank you

Appendix #3

NRCS STREAM BANK EROSION GUIDANCE

***The average annual recession rate is the thickness of soil eroded from a bank surface (perpendicular to the face) in an average year.

Stream bank erosion sometimes presents itself as a major occurrence in a given year, whereas the same bank may not erode significantly for a period of years if no major runoff events occur. Recession rates need to be calculated as an average of years when erosion does and does not occur. Recession rate is not calculated as the erosion occurring after a single event.

Use available resources to assist in the estimation of recession rate: use past and present aerial photography, old survey records, and any other information that helps to determine the bank condition at known times in the past. When such information is lacking or insufficient, field observations and professional judgment are needed to estimate recession rates.

It is often not possible to directly measure recession rates in the field. Therefore, the following table has been included which relates recession rates to narrative descriptions of banks eroding at different rates (Table from NRCS Wisconsin guidance).

Lateral Recession Rate (ft/yr)	Category	Description
0.01-0.05	Slight	Some bare bank but active erosion not readily apparent. Some rills but no vegetative overhang. No exposed tree roots.
0.06-0.2	Moderate	Bank is predominantly bare with some rills and vegetative overhang. Some exposed tree roots but no slumps or slips.
0.3-0.5	Severe	Bank is bare with rills and severe vegetative overhang. Many exposed tree roots and some fallen trees and slumps or slips. Some changes in cultural features such as fence comers missing and realignment of roads or trails. Channel cross section becomes U-shaped as opposed to V-shaped.
0.5+	Very Severe	Bank is bare with gullies and severe vegetative overhang. Many fallen trees, drains and culverts eroding out and changes in cultural features as above. Massive slips or washouts common. Channel cross section is U-shaped and stream course may be meandering.

Appendix #4

DRAFT
STREAMBANK RESTORATION PLAN

CONSTRUCTION PLAN

PRACTICE - STREAMBANK PROTECTION (580); STREAM HABITAT (395); OBST RMVL (500)

LANDOWNER - CROCKETT CTY CATTLE LLC

LANDOWNER ADDRESS - 19081 ST HWY 71, NORWALK, WI 54648

LANDOWNER PHONE - 608-823-7445 COUNTY - MONROE

TOWNSHIP - RIDGEVILLE T 16 N, R 2 W, SEC. 34

FIELD OFFICE - SPARTA TELEPHONE NO. - 608-269-8975

LOCATION MAP



Not to Scale

DIGGERS HOTLINE

Call 3 Work Days
Before You Dig!
Toll Free
1-800-242-8511

Internet
<http://www.diggershotline.com>

Utilities: Any representation made by the USDA, Natural Resources Conservation Service, or the Monroe County LCD, as to the approximate location or nonexistence of above or underground hazards does not relieve the owner of the property or the excavator that is hired to complete construction, from notifying Digger's Hotline of the pending construction. You will be liable for damages resulting from construction activities. **(Call Diggers Hotline.) Ticket #** _____

Landowner Agreement: 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 or specifications must be approved by the NRCS before installation. I assume all responsibility for negotiations and contract agreements with the construction contractors.

Estimated Quantities and Cost Estimate: Quantities are estimated to the neat lines and grades of in-place materials shown on the construction plan unless otherwise stated. Truck yardage, loose fill, shrinkage, etc., must be calculated and compensated for by the contractor preparing a bid or constructing the project. Agency cost estimates are based on costs of similar projects and cost of materials at the time of the estimate. Costs do not reflect spikes in material or fuel costs. NRCS highly recommends you, as the owner of the project, obtain multiple bids for a comparison to the agency cost estimate.

Signed: _____ Date: _____

Designed by: Christina Mulder Date: 8/13/18

Checked by: Byrce Richardson Date: 8/13/18

Approved by: Byrce Richardson Date: 8/13/18

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 395-I
580-II

Sheet 1 of 8

CONSTRUCTION NOTES

1. A preconstruction meeting shall be scheduled with Monroe County LCD personal, the contractor, and the landowner prior to construction start-up. Contractor shall notify the Sparta LCD Field Office (608-269-8975) at least one week prior to the start of construction.
2. Contact County Planning and Zoning Department and Local Township for possible permits. Landowner must receive the DNR and all other required permits prior to start of construction.
3. **Contact Diggers Hotline at least 3 days prior to start of construction. (800) 242-8511 (811) or DiggersHotline.com.** Notification of affected utility companies is the responsibility of the contractor.
4. All estimated quantities are based on neat lines and grades unless otherwise stated. Technician will stake the project prior to construction.
5. Trees and other debris located along streambanks will be removed as directed by technician throughout length of project area. Trees and debris will be disposed of in an area agreed upon by the landowner and technician and then hauled off site or safely burned.
6. Rock riprap must be from a tested and approved quarry. Contractor must provide the technician with the proposed rock source quarry name prior to the start of construction to verify its approval.
7. Key in upstream and downstream ends of the rip rap. Provide smooth transition from bank slope face to rock face.
8. Technician must be on site during placement of in-stream log habitat.
9. Any remaining spoil from shaping streambanks will be spread evenly on adjacent land in a manner that allows water to drain freely. **Spoil shall not enter a wetland depression.**
10. All disturbed areas will be mulched and seeded according to seeding plan.
11. LCD personal will be on site regularly to ensure proper construction is being completed.
12. Contractor will be responsible for correcting problems which occur as the result of not following proper construction procedures.

Streambank Habitat (395)
Streambank Protection (580)

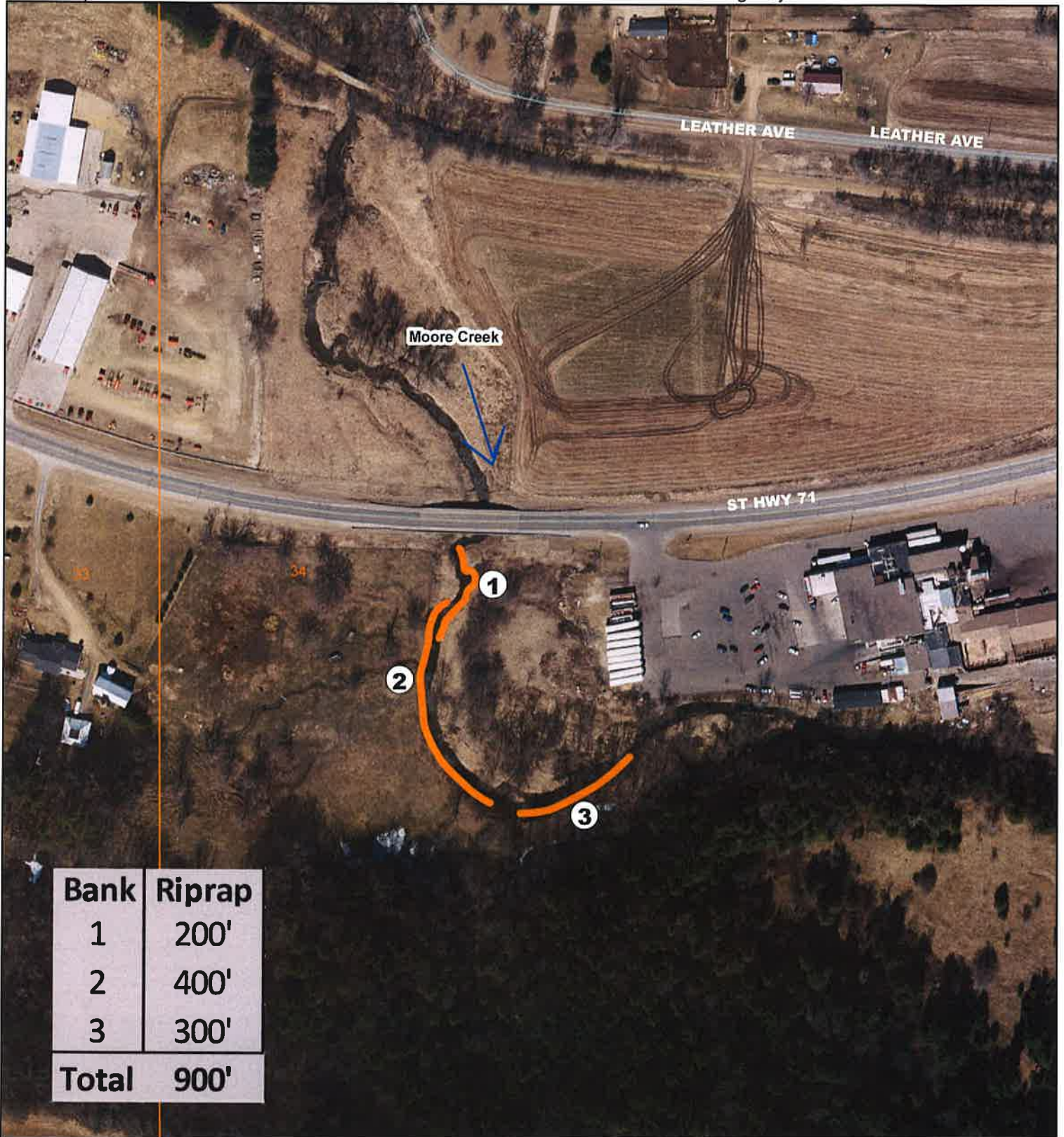
Designed: CLM Checked: *PR*

Sheet 3 of 8

Customer(s): CROCKETT CTY CATTLE LLC
 Legal Description: T16N, R2W, SEC 34
 Township: RIDGEVILLE

Plan Map

Field Office: SPARTA SERVICE CENTER
 Agency: MONROE COUNTY LCD



Legend

roads_MonroeCo

Monroe Sections

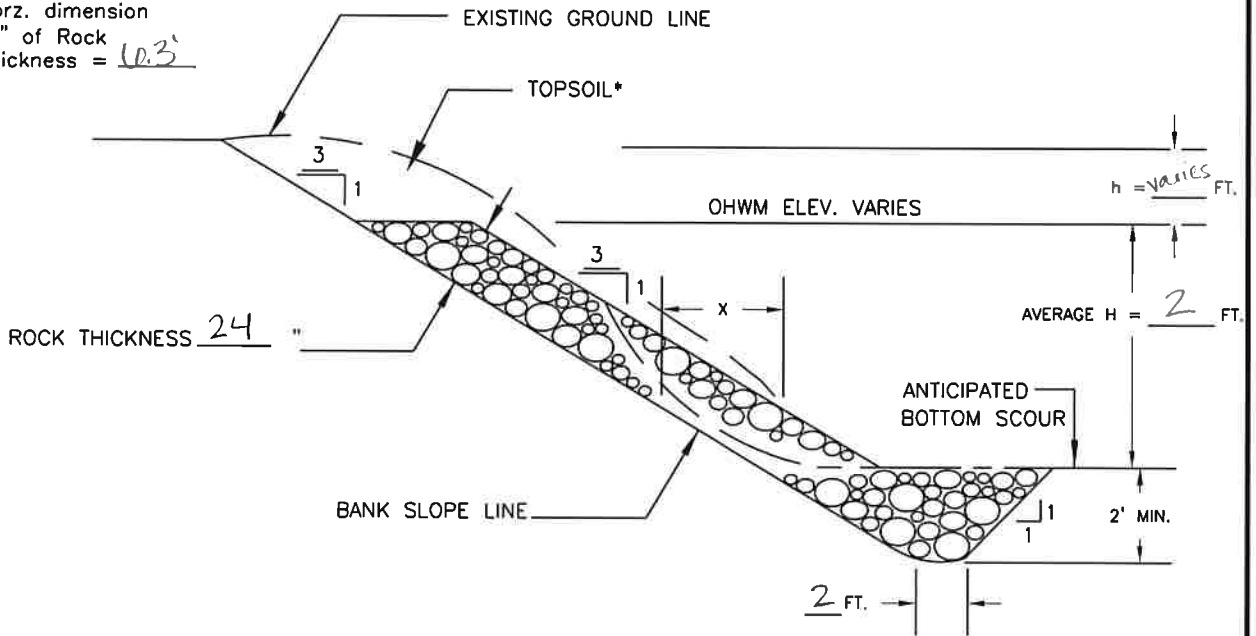
Rock Riprap



Date: 8/9/18



Horz. dimension
"X" of Rock
Thickness = 10.3'



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	2

QUANTITY ESTIMATE*

BANK SLOPING FOR RIPRAP	<u>900</u>	LIN. FT.
BANK SLOPING (SEEDING ONLY)	<u> </u>	LIN. FT.
ROCK FOR RIPRAP (WI CONST. SPEC. 9)	<u>833</u>	CU. YD.
SEEDING	<u>0.5</u>	ACRES

*ESTIMATED TO THE NEAT LINES AND GRADE

NOTES:

1. DOUBLE THE ROCK THICKNESS FOR A DISTANCE OF 4 FEET AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE RIPRAP. BLEND THE ROCK SURFACE TO MATCH THE EXISTING STABLE BANK SURFACE.
2. * SPREAD TOPSOIL TO WITHIN 1' OF STREAM EDGE. TRACK ALL TOPSOIL PERPENDICULAR TO STREAM TO REDUCE EROSION.

THIS STANDARDIZED DESIGN MUST BE ADAPTED TO THE SPECIFIC SITE.

EXCAVATED KEYWAY

SITE ALL



STREAMBANK PROTECTION NO FILTER OR GEOTEXTILE (PARTIAL BANK HEIGHT)

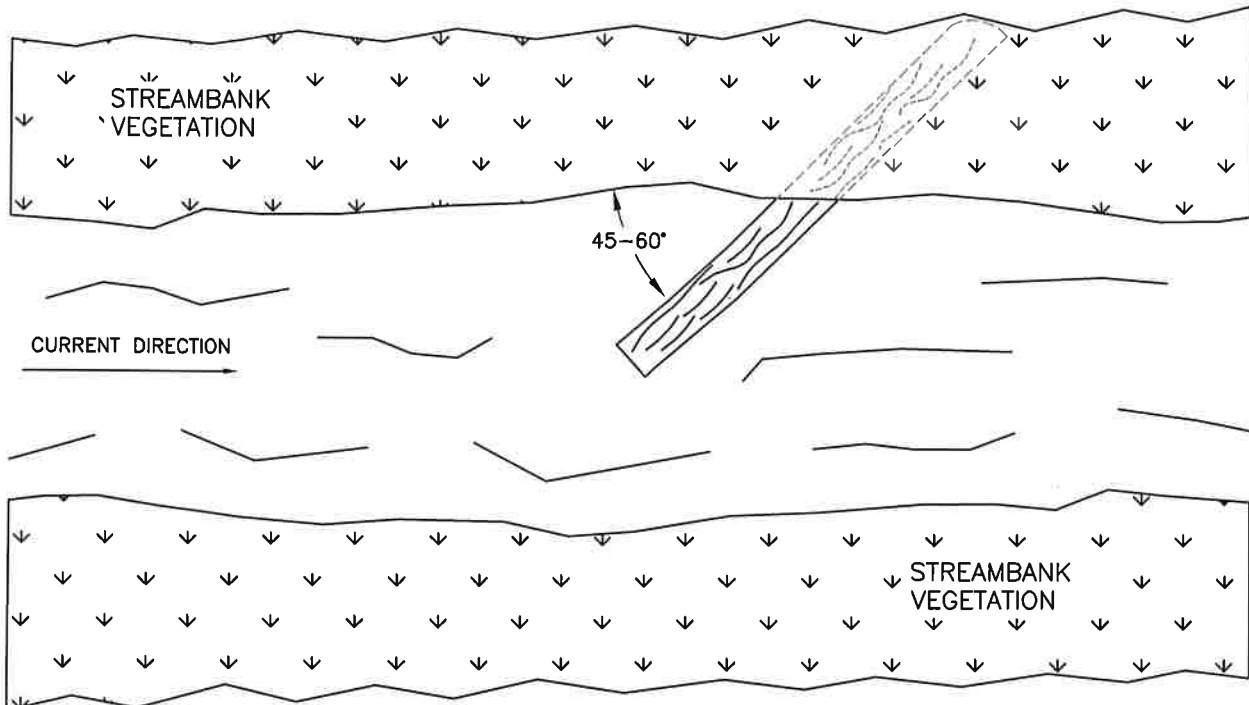
CLIENT: Crockett City Cattle
COUNTY: Monroe

Designed CLM Date 8/18
Drawn _____
Checked _____
Approved BAR 8/18

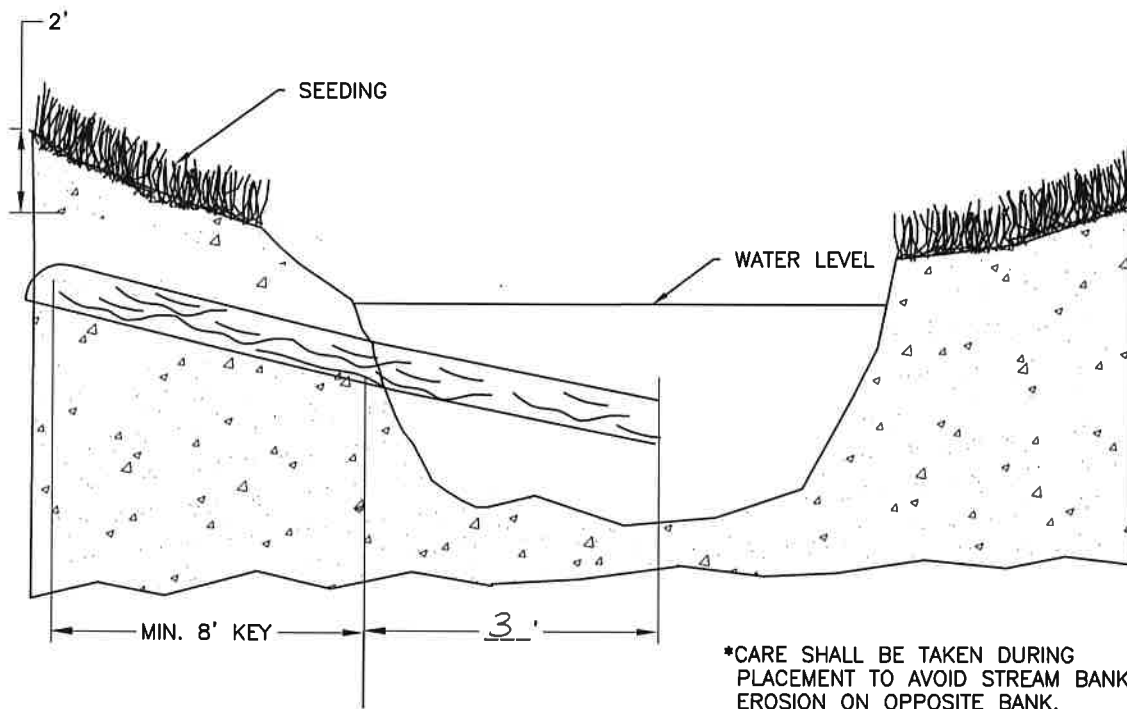
File Name
WI-404E

Date
6/07

Sheet 5 of 8



PLAN VIEW



CROSS SECTION

*CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID STREAM BANK EROSION ON OPPOSITE BANK.

*ROOTS/LIMBS SHALL BE TRIMMED SO AS TO BE BELOW THE ORDINARY HIGH WATER MARK.



United States Department of Agriculture

Natural Resources Conservation Service

INSTREAM LOG

CLIENT: Crockett City Cattle

COUNTY: MONROE

Designed	<u>JMA CLM</u>	Date	<u>11/17/19</u>
Drawn		Date	
Checked		Date	<u>04/18</u>
Approved	<u>BAR</u>	Date	<u>8/18</u>

File Name

Date

04/18

Sheet 10 of 8

SEEDING DATES

CENTRAL

TIME PERIOD	DATES			TYPE OF SEEDING
Spring	April 15	through	June 1	Permanent
Summer	June 2	through	see WI-710ss pg 2	Temporary *
Late Summer	August 1	through	August 21	Permanent
Fall	August 22	through	see WI-710ss pg 2	Temporary *
Late Fall	November 1	through	Snow Cover	Dormant
Winter	Snow Cover	through	April 14	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 of 80-89 lime or equivalent.

* Seed a temporary cover crop of Winter Wheat at 120 # /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)	9	LOCATION: ACRES:	DISTURBED 0.50
SPECIES	RATE	POUNDS	
Kentucky Bluegrass	3.3	1.7	
Creeping Red Fescue	4.4	2.2	
Perennial Ryegrass	11.0	5.5	
** Winter Wheat	120.0	60.0	

SEEDING MIX (AS-BUILT)	LOCATION ACRES	
SPECIES	RATE	POUNDS


¹ PLS lbs. = (total % Germination / 100 * % Purity / 100) * Net Weight (lbs.) ADDITIONAL SEED PERCENT: 10 %
 ** Companion Crop Mulching Required Yes

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 1/4 to 1/2 inch deep.

 <p>Natural Resources Conservation Service United States Department of Agriculture</p>	INTRODUCED SPECIES SEEDING ESTABLISHMENT		Designed <u>CLM</u> Dat <u>8/10/18</u>	File Name <u>WI-710SS</u>
	COOPERATOR <u>Crockett Cty Cattle LLC</u>	Drawn _____	Checked _____	pg 1 of 2 12-2016
	COUNTY <u>MONROE</u>	Approved <u>BAF</u> <u>8/18</u>	Approved _____	Sheet <u>7</u> of <u>8</u>
	_____	_____	_____	_____

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.

 <p>Natural Resources Conservation Service United States Department of Agriculture</p>	INTRODUCED SPECIES SEEDING ESTABLISHMENT		Designed <u>CLM</u> <small>Date</small> <u>8/10/18</u>	File Name
	COOPERATOR	<u>Crockett Cty Cattle LLC</u>	Drawn _____	WI-710SS Pg 2 of 2 12-2016
	COUNTY	<u>MONROE</u>	Checked _____	Sheet <u>8</u> of <u>8</u>
			Approved <u>BAR</u> <u>8/18</u>	

Operation and Maintenance Plan Streambank and Shoreline Protection & Habitat Improvement

Cooperator: CROCKETT CTY CATTLE LLC

Date: 8/13/18

By: Christina Mulder

Title: Soil & Water Conservationist

Project Location: T16N, R2W, Sec 34

I agree to the following for the next 20 years.

1. Check the riprap, habitat structures, plantings, at least once each year and immediately after severe floods. Rock removed or displaced shall be replaced as needed. 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. Check for sloughing, erosion, or damage to vegetative cover. Damaged areas shall be graded, shaped, and re-vegetated as soon as possible
4. Immediately repair any vandalism, vehicle or livestock damage.
5. Livestock will be managed in the stream corridor to maintain vegetative cover and prevent erosion.
6. Eliminate all burrowing rodents and repair damage caused by them.

Cooperator's signature: _____

Date: _____

I have discussed the maintenance guidelines with the above cooperator.

Conservationist's signature: _____

Date: _____

