

Wisconsin Department of Natural Resources  
Bureau of Watershed Management (WT/3)  
101 S. Webster Street  
PO Box 7921  
Madison, WI 53707-7921  
[dnr.wi.gov](http://dnr.wi.gov)

**Final Report**

Agricultural Targeted Runoff Management &  
Notice of Discharge Grant Programs

Form 3400-189A (R 01/20)

Page 1 of 3

**NOTICE:** This document is required under s. 281.65, Wis. Stats., and chs. NR 153 and 154, Wis. Adm. Code. A final project report must be submitted as part of the final reimbursement request. Personally identifiable information contained in this form will be used for determining reimbursement eligibility in the Targeted Runoff Management and Notice of Discharge Grant Programs and will not be used for any other purpose.

**INSTRUCTIONS:** Send the completed, electronic copy of this form and all attachments to the Department of Natural Resources (DNR) Region Nonpoint Source Coordinator. Please read all instructions prior to completion.

**Grant Type**Select Grant Type **Notice of Discharge****Grant Information**

Grantee - Governmental Unit Name		Grant Number
Green Lake County Land Conservation Department		NOD24000Y19
Project Name		
Bill Krentz Manure Storage Project		
Project Contact Name	Phone Number	E-mail Address
Jordan Dornfeld	(920) 294-4051	jdornfeld@co.green-lake.wi.us

**Site 1 - Location & Watershed Information**

Additional sites may be added to the project by clicking on the [+Loc] button

Name of Cost-Share Recipient		Animal Units	Latitude	Longitude
William Krentz		50	43.74285	-88.97086
County	12-Digit HUC	12-Digit Watershed Name		
Green Lake	040302010402	Little Green Lake-Grand River		
Nearest Receiving Waterbody		Primary Waterbody addressed by project		
Unnamed trib. (WBIC 5027630) to Little Green Lake		Little Green Lake		

**Site 1 - BMP & Load Reduction Information**

Additional BMPs for this site may be added by clicking on the [+] button

	Best Management Practice Installed	Quantity	Unit of Measure	Performance Standard/Prohibition Addressed	Load Reduction			Total Installation Cost
					Phosphorus lbs/yr	Nitrogen lbs/yr	Sediment Tons/yr	
-	Diversions	237	Feet	Code(s) 8	0.4	1.1	0.3	\$2,168.03
-	Roof Runoff Systems	4	No.	Code(s) 8				\$1,809.55
-	Manure Storage System Closure	1	No.	Code(s) 5				\$630.15
-	Manure Storage Systems	1	No.	Code(s) 4	156.8	849.4		\$134,106.99

**Model(s)/Methods Used to Calculate Load Reduction (check all that apply)**
☒ STEPL   ☒ SNAP+   ☐ BARNY   ☐ RUSLE 2   ☐ Other (specify) \_\_\_\_\_
**Site 1 - Compliance Requirements**

Performance Standard or Prohibition Addressed	Chs. NR 151 or 243 Wis. Adm. Code Notice Type	Notice Letter Attached?	Compliance Achieved?	Compliance letter attached?
Manure storage facilities-new/significant alterations.	NR 151	Yes	Yes	Yes
Manure storage facilities-closure.	NR 151	Yes	Yes	Yes
Clean water diversions.	NR 151	Yes	Yes	Yes

**Check all of the true statements below.**

- ☒ 1. A copy the compliance letter for site 1 has been placed in county files.
2. The attached compliance letter for site 1:
- ☒ a. has been provided by the county to the landowner and cost-share recipient;
  - ☒ b. identifies each of the performance standards & prohibitions (PS&Ps) on cropland and livestock facilities brought into compliance by the project, and listed in the table above;
  - ☒ c. identifies the name and location of the facility where compliance has been achieved; and
  - ☒ d. states that the landowner is obligated to maintain compliance with each PS&P addressed by the project in perpetuity regardless of future cost sharing.

**Site 1 - Required attachments**

Check the box if the required information for the site is attached:

## Final Report

Agricultural Targeted Runoff Management &  
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- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Photos of pre-and post-implementation of BMP(s) | <input checked="" type="checkbox"/> Load reduction modeling documents            |
| <input checked="" type="checkbox"/> Aerial photo map of site with BMPs labeled      | <input type="checkbox"/> Water quality monitoring results/summary, if applicable |

### Site 1 - Information

*Narrative space will expand to fit*

The subject site was initially housing 150 head of steers when the discharge occurred and the NOD was issued. During heavy rain events water from the north farm field would channelize and flow into the feedlot washing manure from the feedlot into a non-permitted manure storage structure. The non-permitted storage structure was properly abandoned and all contaminated soil was excavated and land applied to growing crops. The new manure storage was designed per state standards to contain waste for 50 head of steers for a 45 day time period. The landowner will now maintain approximately 50 head of steers to allow the new feedlot and manure storage structure to operate at maximum efficiency. The new manure storage structure is made of reinforced concrete and has a secondary liner that consists of clay that is 2' thick that surrounds the sides and bottom of the structure. The remainder of the feedlot that was dirt was converted to concrete to aid in cleaning and to prevent nutrient leaching into the soil. A clean water diversion was installed north of the feedlot to divert storm water from the farm field so it can no longer flow into the new feedlot area. This will also minimize waste water entering the new manure storage structure. Another clean water diversion was installed on the east side of the feedlot to direct storm water to the road ditch. All clean water diversions will receive maintenance when needed to maintain design depth, width and grade. Roof gutters were installed on all buildings adjacent to the feedlot to direct clean water away from the feedlot where it flows into a grassed road ditch. New concrete walls were poured to contain feedlot waste and direct all waste in to the new manure storage structure. All practices meet current state and federal standards.

☐ DNR may use this site as a success story to meet state and federal reporting needs.

+ Loc

### Additional Project Information and/or Comments

*Narrative space will expand to fit*

### Grantee Certification

A responsible government official (authorized signatory) must authorize and date the final report form prior to submittal to DNR.

I certify that, to the best of my knowledge, the project is complete and the information contained in this final report and attachments are correct and true.

Name of Authorized Government Official	Title of Authorized Government Official	Date
Paul Gunderson	County Conservationist	10/14/2020

### For DNR Use Only

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Received complete reports with all attachments | <input checked="" type="checkbox"/> Practices implemented were consistent with the grant agreement |
|--|--|

Comments about this project:

## Final Report

Agricultural Targeted Runoff Management &  
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<b>For DNR Use Only</b>	
Name of Region Nonpoint Source Coordinator	Date
Eric Evensen	10/30/2020
Send the Final Report and attachments to the Community Financial Assistance Grants Manager and to the Runoff Management Grant Coordinator. Keep a printed copy for the Region file.	



Notice Letter

State of Wisconsin  
DEPARTMENT OF NATURAL RESOURCES  
625 E. County Road Y, Suite 700  
Oshkosh WI 54901

Scott Walker, Governor  
Daniel L. Meyer, Secretary  
Telephone 608-266-2621  
Toll Free 1-888-936-7463  
TTY Access via relay - 711



October 30, 2018

Bill Krentz  
N1265 County Road A  
Markesan WI 53946

**Subject: Notice of Discharge – Category II**

Dear Mr. Krentz:

\*\*\*Certified Mail\*\*\*

On August 28, 2018, the Wisconsin Department of Natural Resources (Department) conducted an inspection of your livestock facility located at N3095 State Road 44, Township of Green Lake, Green Lake County as a follow up to a manure runoff complaint received by the Department. A copy of the site inspection report is enclosed for your review.

Based on the site inspection, the Department has reason to believe that:

- Your livestock facility is in violation of s. NR 151.08(4), Wisconsin Administrative Code.

*"A livestock operation shall have no direct runoff from a feedlot or stored manure into waters of the state."*

The concrete feedlot present at your livestock operation discharged to a storage structure, that does not meet state standards, which overtopped allowing manure to flow through your corn field to Lake Shore Drive road ditch. Manure then entered E Little Green Road ditch which discharged to an intermittent stream and ultimately Little Green Lake.

- Your livestock facility has had a Category II discharge under s. NR 243.24(1)(b), Wisconsin Administrative Code.

*"A category II unacceptable practice is a practice or facility at an animal feeding operation that causes a discharge of pollutants to waters of the state that is the result of an owner's or operators failure to comply with a livestock performance standard or prohibition in ss. NR 151.05 to 151.08."*

Through this letter the department is issuing your operation a Category II Notice of Discharge in accordance with s. NR 243.24(3), Wis. Admin. Code. State regulations require that cost share dollars be offered to implement best management practices to correct a Category II discharge at existing livestock facilities. The Green Lake County Land Conservation Department (County) is willing to provide you with technical assistance. Please contact Paul Gunderson with Green Lake County at 920-294-4055 for assistance.

- Your facility is an "existing facility" based on s. NR 151.095, Wis. Adm. Code requiring cost sharing to implement the corrective measures to address your discharge.

In efforts to comply with this notice, please continue to implement interim measures of regularly pumping the manure storage structure with special consideration given before anticipated precipitation events. This material should be land applied according to your nutrient management plan. Also, please work with the County to determine what corrective actions will be taken to prevent this discharge moving forward. Once corrective actions are determined, please inform me directly or have the County inform me of your plan by no later than April 15, 2019. Please work to permanently correct the discharge by no later than December 1, 2019. Actions that could be considered but are not limited to:

- o Implement clean water diversions and rain gutters to keep clean water clean
- o Construct a manure storage facility that meets state standards
- o Construct a roof over the concrete feedlot to reduce the amount of clean water mixing with manure

Failure to comply may result in the Department taking additional enforcement action including monetary forfeitures pursuant to s. 281.98, Stats., require the submittal of a WPDES permit application, or other appropriate actions such as case referral to the Department of Justice. The Department expects that further enforcement should not be necessary if you continue to work with Green Lake County to install practices to correct the discharge without further delay.

Please contact me at (920) 303-5447 or [Eric.Evensen@wisconsin.gov](mailto:Eric.Evensen@wisconsin.gov) if you have any questions regarding this issue.

Sincerely,



Eric Evensen  
Northeast Nonpoint Source Coordinator

CC: File

E-Copy: Paul Gunderson, Jordan Dornfeld – Green Lake County Land Conservation  
Joseph Baeten, Mike Gilbertson – Wisconsin Department of Natural Resources

Enclosure: Site Inspection Report



## GREEN LAKE COUNTY Land Conservation Department

571 County Road A  
PO Box 3188  
Green Lake, WI 54941-3188

Phone: 920-294-4051  
FAX: 920-294-4056  
Email: [lcd@co.green-lake.wi.us](mailto:lcd@co.green-lake.wi.us)

September 16, 2020

Bill Krentz  
N1265 County Road A  
Markesan, WI 53946

RE: Compliance Determination

Dear Mr. Krentz,

On October 30, 2018 the Department of Natural Resources issued a Category II Notice of Discharge – Discharge of Pollutants to Waters of the State. The site is located at N3095 State Road 44, Markesan, WI 53946. This determination was made based on the facts that the concrete feedlot at your livestock operation discharged manure to a storage structure that did not meet the state standards. This storage structure ultimately overtopped allowing manure to flow through the corn field where it entered into a road ditch that discharged into Little Green Lake.

Beginning in July 2019 you installed roof runoff structures on all buildings adjacent to the feedlot to divert clean water away from the feedlot. In September 2019 you properly abandoned the old storage structure. In November 2019 you constructed a new manure storage facility that meets current state standards and you also placed cement on the earthen feedlot to contain nutrients and direct all feedlot waste into the approved storage facility. In September 2020 you installed clean water diversions to direct storm water away from the feedlot area. All stored manure will now be land applied in accordance with your Nutrient Management Plan during the most beneficial time for crops to use these nutrients.

As a result of your actions you are now in compliance with the NR 151 Agricultural Performance Standards. The performance standard applicable to the Notice of Discharge is NR151.08 Manure Management Prohibitions. You are obligated to maintain compliance with the performance standard addressed by the cost sharing.

Thank you for your attention to this matter. If you have any questions please give me a call.

Sincerely,

Paul Gunderson  
County Conservationist

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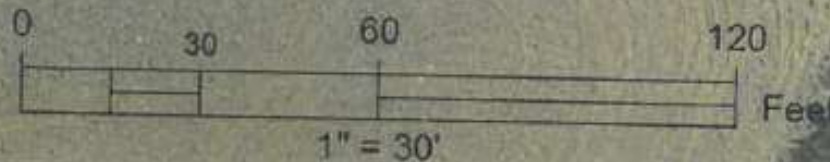
*"Our highest responsibility is to protect and enhance land and water resources that will sustain current and future generations."*

Green Lake County is an Equal Employment Opportunity Employer  
Visit our Web site: [www.co.green-lake.wi.us](http://www.co.green-lake.wi.us)



### Construction Notes:

- Contact Diggers Hotline 3 days prior to starting excavation. Record ticket number and give to Land Conservation Technician.
- Remove and properly dispose of accumulated waste in the facility.
- Soil that is mixed with waste shall be removed and uniformly spread on cropland. In lieu of field application, removed soil may also be thinly spread as topsoil at closure site and vegetated.
- A minimum of 6 inches of soil shall be removed from the sides and bottom of the facility. Any excess soil to be removed shall be determined by the color, consistency, and permeation of saturation of waste within the underlying soils. This determination shall be made by the Land Conservation Technician.
- Erosion minimizing measures shall be taken such as silt fence, hay bale barriers, or temporary seeding and mulching.
- The new concrete lined waste storage facility will be constructed in this area therefore no backfill or mounding of soil will occur in this area.



**USDA**  
United States  
Department of  
Agriculture  
**Natural Resources  
Conservation Service**

### PLAN VIEW

CLIENT: William C. Krentz Revocable Trust  
COUNTY: Green Lake

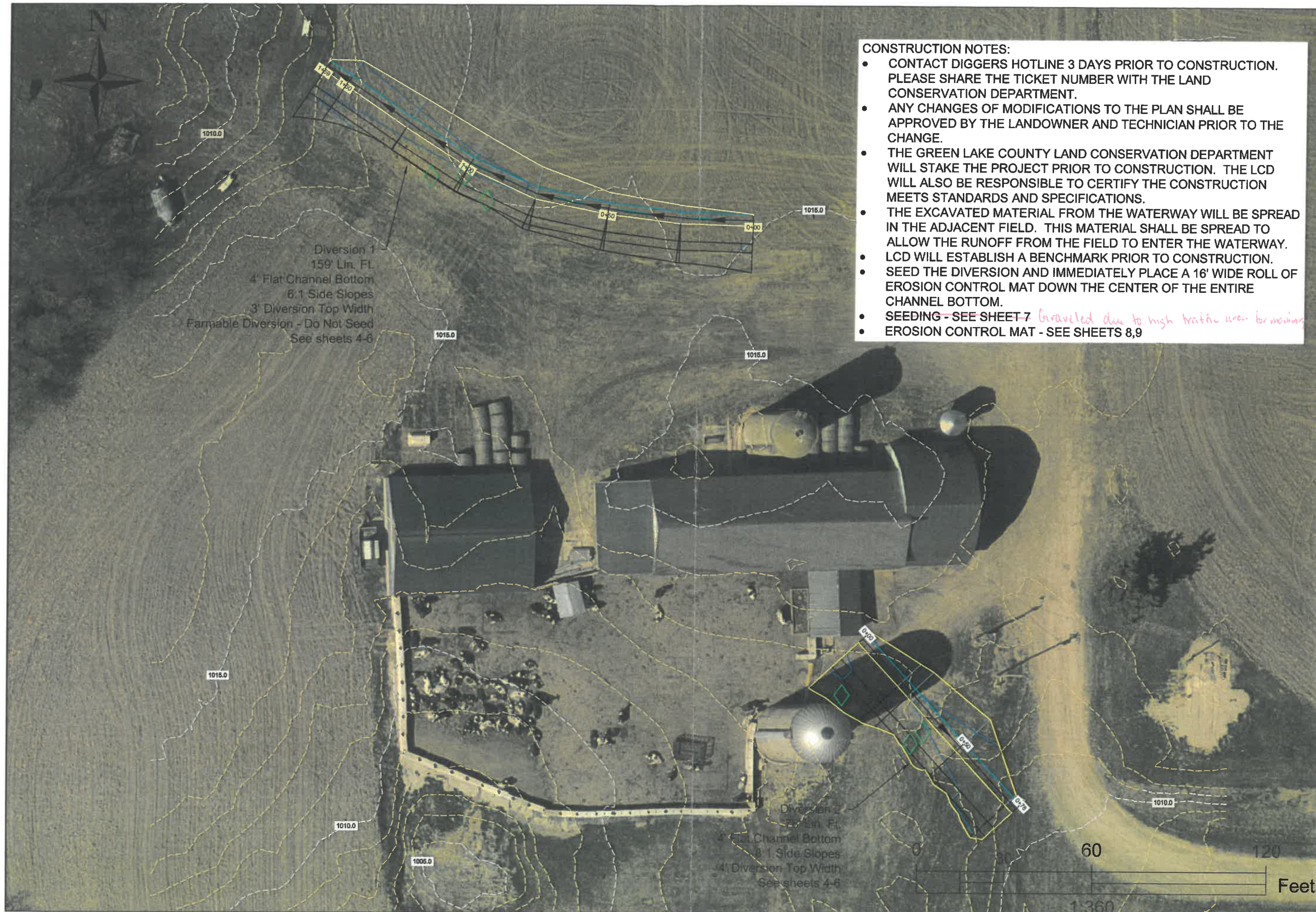
Designed	J. Dornfeld	Date	2-25-19
Drawn	J. Morris	Date	7/29/19
Checked	J. Morris	Date	7/29/19
Approved	J. Morris	Date	7/29/19

Drawing Name: WI-012  
Date: 06/14  
Sheet 3 of 4









- CONSTRUCTION NOTES:**
- CONTACT DIGGERS HOTLINE 3 DAYS PRIOR TO CONSTRUCTION. PLEASE SHARE THE TICKET NUMBER WITH THE LAND CONSERVATION DEPARTMENT.
  - ANY CHANGES OF MODIFICATIONS TO THE PLAN SHALL BE APPROVED BY THE LANDOWNER AND TECHNICIAN PRIOR TO THE CHANGE.
  - THE GREEN LAKE COUNTY LAND CONSERVATION DEPARTMENT WILL STAKE THE PROJECT PRIOR TO CONSTRUCTION. THE LCD WILL ALSO BE RESPONSIBLE TO CERTIFY THE CONSTRUCTION MEETS STANDARDS AND SPECIFICATIONS.
  - THE EXCAVATED MATERIAL FROM THE WATERWAY WILL BE SPREAD IN THE ADJACENT FIELD. THIS MATERIAL SHALL BE SPREAD TO ALLOW THE RUNOFF FROM THE FIELD TO ENTER THE WATERWAY.
  - LCD WILL ESTABLISH A BENCHMARK PRIOR TO CONSTRUCTION.
  - SEED THE DIVERSION AND IMMEDIATELY PLACE A 16' WIDE ROLL OF EROSION CONTROL MAT DOWN THE CENTER OF THE ENTIRE CHANNEL BOTTOM.
  - SEEDING - SEE SHEET 7 *Graveled due to high traffic area for mowing*
  - EROSION CONTROL MAT - SEE SHEETS 8,9



DATE: 03-21-19  
DESIGNED: J. Dorf  
DRAWN: J. Marks  
CHECKED: J. Marks  
APPROVED:

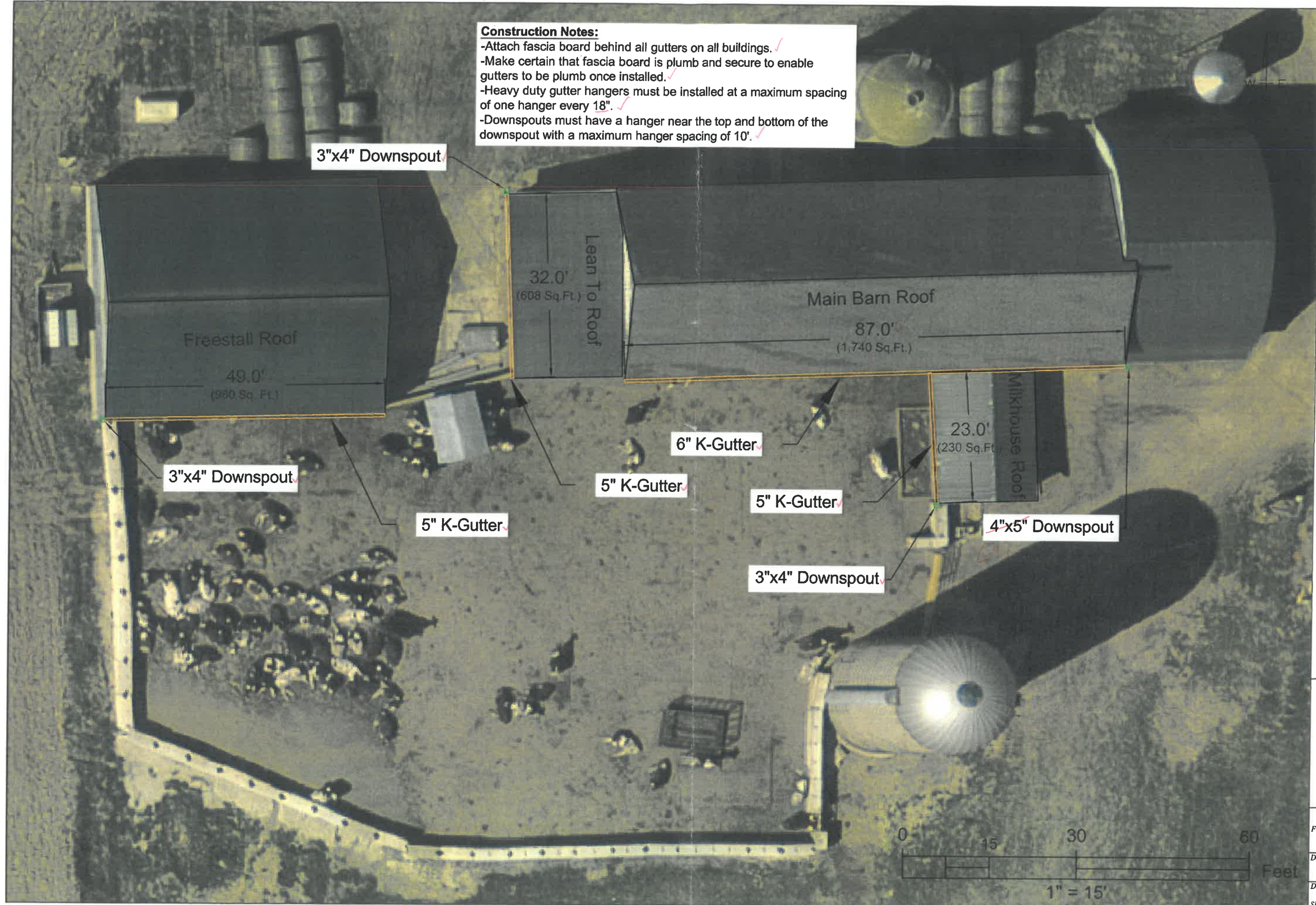
William C. Krentz Revocable Trust

PLAN VIEW


**LCD**  
GREEN LAKE COUNTY  
DEPARTMENT OF  
LAND CONSERVATION

FILE NAME  
FILE NAME  
DRAWING NAME  
GLC-PLAN-003  
DATE: 01/07/2019  
SHEET 3 OF 9





**Construction Notes:**  
-Attach fascia board behind all gutters on all buildings. ✓  
-Make certain that fascia board is plumb and secure to enable gutters to be plumb once installed. ✓  
-Heavy duty gutter hangers must be installed at a maximum spacing of one hanger every 18". ✓  
-Downspouts must have a hanger near the top and bottom of the downspout with a maximum hanger spacing of 10'. ✓



DESIGNED: J. Dorfelfeld 5/5/19  
DATE: 5/5/19  
DRAWN: J. Dorfelfeld  
CHECKED: J. Dorfelfeld  
APPROVED: J. Dorfelfeld

William C. Krentz Revocable Trust

PLAN VIEW

**LCD**  
GREEN LAKE COUNTY  
DEPARTMENT OF  
LAND CONSERVATION

FILE NAME  
FILE NAME  
DRAWING NAME  
GLC-PLAN-003  
DATE: 01/07/2019  
SHEET 3 OF 4



## NM4: Manure Tracking Report

Starting Year	2021
Reported For	William H Krentz
Printed	2020-09-16
Plan Completion/Update Date:	2019-08-23
SnapPlus Version 19.3 built on 2020-05-11	
S:\FarmPlans\Mackford\Krentz, William H\Nutrient Management\William H Krentz.snapDb	

Prepared for:  
William H Krentz  
attn: William H Krentz  
N1265 Cty Rd A  
Markesan , 53946

Acres/ CropYear	2021	2022	2023
Acres in plan	167.4	167.4	167.4
Acres receiving manure	162.4	162.4	0.0

### Annual Manure Production And Use By Source

Total Value = \$ Value of all nutrients, incorporated including S.

Source		2021	2022	2023
Beef Solid	Production (Tons)	0	0	0
	Used (Tons)	729	729	0
	Analysis Date	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	3/4/5-6-10	3/4/5-6-10	3/4/5-6-10
	Dry Matter (%)	29	29	29
	Total Value	0.00	0.00	0.00

### Estimated Livestock Manure Production For 2021

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Beef Calf 450 lbs			0	365	0	0	0	0
Beef High Forage 750 lbs			0	365	0	0	0	0
Beef High Forage 1100 lbs			0	365	0	0	0	0
Beef High Energy 750 lbs			0	365	0	0	0	0
Beef Cow 1000 lbs			0	365	0	0	0	0

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Beef Bulls 1400 lbs			0	365	0	0	0	0
Beef High Energy 1100 lbs			50	365	100	0	730	0
Farm Totals							730	0

**Manure Storage For 2021**

No Storages Found

**Spreaders For 2021**

No Spreaders Found



### NM3: Field Data and 590 Assessment Plan

Reported For	William H Krentz
Printed	2020-09-16
Plan Completion/Update Date	2019-08-23
SnapPlus Version	19.3 built on 2020-05-11
S:\FarmPlans\Mackford\Krentz, William H\Nutrient Management\William H Krentz.snapDb	

Prepared for:  
William H Krentz  
attn:William H Krentz  
N1265 Cty Rd A  
Markesan , 53946

#### Field Data: 167 Total Acres Reported.

Field Name	Sub Farm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Stp %	F. Stp Len ft	Below Field Slope To Water %	Dist. To Water ft	Contour/ Filters	Irrig	Tiled	Rotation	Tillage	Report Period	Field "T" t/ac	Rot Avg Soil Loss t/ac	SCI	Rot Avg PI	Soil Test P ppm	Rot P205 Bsl lb/ac	P205 Bal Target lb/ac
Pasture				5	Green Lake	KNOWLES Kwd2	16	100	2.1 - 6	301 - 1000	On contour / No	No	No	Cg-Sg15-Wwg+s+acv-Cg-Sg15	NT-NT-NT/NTcvt-NT-NT	2019-2023	2	1	0.8	1	80	-305	0
Scharschmidt East				72.4	Green Lake	LOMIRA LvB	4	200	2.1 - 6	1001 - 5000	No / No	No	No	PE+cv-SCI-Sg15-Wwg+s	FFC/NTcvt-SFC-NT-NT	2019-2022	5	2.5	0.4	4	80	-78	0
Scharschmidt North				32	Green Lake	LEROEY Lrc2	9	150	2.1 - 6	1001 - 5000	No / No	No	No	Cg-Sg15-Wwg+s+acv-Cg	FCD-NT-NT/NTcvt-NT	2019-2022	2	1.7	0.9	4	80	-15	0
Scharschmidt West				58	Green Lake	LOMIRA Lvc2	9	150	2.1 - 6	1001 - 5000	On contour / No	No	No	SCI-Wwg+s-PE+cv-SCI	SFC-NT-SFC/NTcvt-r-NT	2019-2022	5	3.4	0.4	5	80	-50	0

#### Crop Abbreviations

Abbreviation	Crop
Cg	Com grain
PE+cv	Peas to small grain cover crop
SCI	Sweet Corn late plant (June 10 or Later)
Sg15	Soybeans 15-20 inch row

#### Tillage Abbreviations

Abbreviation	Tillage
FCD	Fall Chisel, disked
FFC/NTcvt	Fall Cultivation, cover crop no till
NT	No Till
NT/NTcvt	No Till, cover crop no till

Wwg+s	Winter wheat (grain+straw)
Wwg+s+acr	Winter wheat (grain+straw) to annual cover crop

SFC	Spring Cultivation
SFC/NTcvt	Spring Cultivation, cover crop no till



STEPL Input Sheet:

Values in RED are required input. Change worksheets by clicking on tabs at the bottom.

You entered4subwatershed(s).

This sheet is composed of eight input tables. The first four tables require users to change initial values. The next four tables (initially hidden) contain default values users may choose to change.

**Step 1:** Select the state and county where your watersheds are located. Select a nearby weather station. This will automatically specify values for rainfall parameters in Table 1 and USLE parameters in Table 4.

**Step 2:** (a) Enter land use areas in acres in Table 1; (b) enter total number of agricultural animals by type and number of months per year that manure is applied to croplands in Table 2; (c) enter values for septic system parameters in Table 3; and (d) if desired, modify USLE parameters associated with the selected county in Table 4.

**Step 3:** You may stop here and proceed to the BMPs sheet. If you have more detailed information on your watersheds, click the Yes button in row 10 to display optional input tables.

**Step 4:** (a) Specify the representative Soil Hydrologic Group (SHG) and soil nutrient concentrations in Table 5; (b) modify the curve number table by landuse and SHG in Table 6; (c) modify the nutrient concentrations (mg/L) in runoff in Table 7; and (d) specify the detailed land use distribution in the urban area in Table 8.

**Step 5:** Select BMPs in BMPs sheet.

**Step 6:** View the estimates of loads and load reductions in Total Load and Graphs sheets.

☐ Treat all the subwatersheds as parts of a single watershed

☐ Groundwater load calculation

State

Wisconsin

County

Green Lake

Weather Station

WI MADISON WSO AIRPORT

1. Input watershed land use area (ac) and precipitation (in)									Rain correction factors		
									0.840	0.355	
Watershed	Urban	Cropland	Pastureland	Forest	User Defined	Feedlots	Feedlot Percent Paved	Total	Annual Rainfall	Rain Days	Avg. Rain/Event
W1	0	0.71	0	0	0	0	0-24%	0.71	35.01	97.8	0.847
W2	0	0	0	0	0	0.29	75-100%	0.29	35.01	97.8	0.847
W3	0.1	0	0	0	0	0	0-24%	0.1	35.01	97.8	0.847
W4	0	0	0.45	0	0	0	0-24%	0.46	35.01	97.8	0.847

2. Input agricultural animals									
Watershed	Beef Cattle	Dairy Cattle	Swine (Hog)	Sheep	Horse	Chicken	Turkey	Duck	# of months manure applied
W1	0	0	0	0	0	0	0	0	0
W2	150	0	0	0	0	0	0	0	0
W3	0	0	0	0	0	0	0	0	0
W4	0	0	0	0	0	0	0	0	0
Total	150	0	0	0	0	0	0	0	

3. Input septic system and illegal direct wastewater discharge data					
Watershed	No. of Septic Systems	Population per Septic System	Septic Failure Rate, %	Wastewater Direct Discharge, # of People	Direct Discharge Reduction, %
W1	0	2.43	2	0	0
W2	0	2.43	2	0	0
W3	0	2.43	2	0	0
W4	0	2.43	2	0	0

4. Modify the Universal Soil Loss Equation (USLE) parameters																		
Watershed	Cropland					Pastureland					Forest					User Defined		
	R	K	LS	C	P	R	K	LS	C	P	R	K	LS	C	P	R		
W1	130.140	0.253	0.532	0.200	0.942	130.140	0.253	0.532	0.040	1.000	130.140	0.253	0.532	0.003	1.000	130.140		
W2	130.140	0.253	0.532	0.200	0.942	130.140	0.253	0.532	0.040	1.000	130.140	0.253	0.532	0.003	1.000	130.140		
W3	130.140	0.253	0.532	0.200	0.942	130.140	0.253	0.532	0.040	1.000	130.140	0.253	0.532	0.003	1.000	130.140		
W4	130.140	0.253	0.532	0.200	0.942	130.140	0.253	0.532	0.040	1.000	130.140	0.253	0.532	0.003	1.000	130.140		

Optional Data Input:

5. Select average soil hydrologic group (SHG), SHG A = highest infiltration and SHG D = lowest infiltration

Watershed	SHG A	SHG B	SHG C	SHG D	SHG Selected	Soil N conc. %	Soil P conc. %	Soil BOD conc. %
W1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	B	0.080	0.031	0.160
W2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	B	0.080	0.031	0.160
W3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	B	0.080	0.031	0.160
W4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	B	0.080	0.031	0.160

6. Reference runoff curve number (may be modified)

SHG	A	B	C	D
Urban	83	89	92	93
Cropland	67	78	85	89
Pastureland	49	69	79	84
Forest	39	60	73	79
User Defined	50	70	80	85

7. Nutrient concentration in runoff (mg/l)

Land use	N	P	BOD
1. L-Cropland	1.9	0.3	4
1a. w/ manure	8.1	2	12.3
2. M-Cropland	2.9	0.4	6.1
2a. w/ manure	12.2	3	18.5
3. H-Cropland	4.4	0.5	9.2
3a. w/ manure	18.3	4	24.6
4. Pastureland	4	0.3	13
5. Forest	0.2	0.1	0.5
6. User Defined	0	0	0

6a. Detailed urban reference runoff curve number (may be modified)

Urban\SHG	A	B	C	D
Commercial	89	92	94	95
Industrial	81	88	91	93
Institutional	81	88	91	93
Transportation	98	98	98	98
Multi-Family	77	85	90	92
Single-Family	57	72	81	86
Urban-Cultivated	67	78	85	89
Vacant-Developed	77	85	90	92
Open Space	49	69	79	84

7a. Nutrient concentration in shallow groundwater (mg/l) (may be modified)

Landuse	N	P	BOD
Urban	1.5	0.063	0
Cropland	1.44	0.063	0
Pastureland	1.44	0.063	0
Forest	0.11	0.009	0
Feedlot	6	0.07	0
User-Defined	0	0	0

8. Input or modify urban land use distribution

Watershed	Urban Area (ac.)	Commercial %	Industrial %	Institutional %	Transportation %	Multi-Family %	Single-Family %	Urban-Cultivated %	Vacant (developed)	Open Space %	Total % Area
W1	0	15	10	10	10	10	30	5	5	5	100
W2	0	15	10	10	10	10	30	5	5	5	100
W3	0.1	15	10	10	10	10	30	5	5	5	100
W4	0	15	10	10	10	10	30	5	5	5	100

9. Input irrigation area (ac) and irrigation amount (in)

Watershed	Total Cropland (ac)	Cropland: Acres Irrigated	Water Depth (in) per Irrigation - Before BMP	Water Depth (in) per Irrigation - After BMP	Irrigation Frequency (#/Year)
W1	0.71	0	0	0	0
W2	0	0	0	0	0
W3	0	0	0	0	0
W4	0	0	0	0	0

Input Ends Here.



**Best Management Practice** Select an appropriate BMP except "Combined BMPs-Calculated" for each subwatershed in each land use table using the pull-down list-box if interactions between BMPs are not considered. Select "Combined BMPs-Calculated" if multiple BMPs and their interactions in the subwatersheds are considered; use BMP calculator (under STEPL menu) to obtain the combined BMP efficiencies and enter them in Table 7.

Urban BMP Tool

Gully and  
Streambank Erosion

1. BMPs and efficiencies for different pollutants on CROPLAND, ND=No Data

Watershed	Cropland					BMPs	% Area BMP Applied
	N	P	BOD	Sediment			
W1	0.04	0.12	ND	0.14		0 Diversion	40
W2	0	0	0	0		0 No BMP	0
W3	0	0	0	0		0 No BMP	0
W4	0	0	0	0		0 No BMP	0

2. BMPs and efficiencies for different pollutants on PASTURELAND, ND=No Data

Watershed	Pastureland					BMPs	% Area BMP Applied
	N	P	BOD	Sediment			
W1	0	0	0	0		0 No BMP	0
W2	0	0	0	0		0 No BMP	0
W3	0	0	0	0		0 No BMP	0
W4	0	0	0	0		Combined BMPs-Calculated	10

3. BMPs and efficiencies for different pollutants on FOREST, ND=No Data

Watershed	Forest					BMPs	% Area BMP Applied
	N	P	BOD	Sediment			
W1	0	0	0	0		0 No BMP	0
W2	0	0	0	0		0 No BMP	0
W3	0	0	0	0		0 No BMP	0
W4	0	0	0	0		0 No BMP	0

4. BMPs and efficiencies for different pollutants on USER DEFINED land use, ND=No Data

Watershed	User Defined					BMPs	% Area BMP Applied
	N	P	BOD	Sediment			
W1	0	0	0	0		0 No BMP	0
W2	0	0	0	0		0 No BMP	0
W3	0	0	0	0		0 No BMP	0
W4	0	0	0	0		0 No BMP	0

5. BMPs and efficiencies for different pollutants on FEEDLOTS, ND=No Data

Watershed	Feedlots					BMPs	%Area BMP Applied
	N	P	BOD	Sediment			
W1	0	0	0	0		0 No BMP	0
W2	0.65	0.6	ND	ND		Waste Storage Facility	100
W3	0	0	0	0		0 No BMP	0
W4	0	0	0	0		0 No BMP	0

6. BMPs and efficiencies for different pollutants on URBAN

To change/set BMP/LID for urban land uses, click the 'Urban BMP Tool' button on the top-left of this sheet.

7. Combined watershed BMP efficiencies from the BMP calculator

Watershed	Watershed Combined BMP Efficiencies				
	N	P	BOD	Sediment	BMPs
W1-Crop	0	0	0	0	Combined BMPs



W2-Crop	0	0	0	0	Combined BMPs
W3-Crop	0	0	0	0	Combined BMPs
W4-Crop	0	0	0	0	Combined BMPs
W1-Pasture	0	0	0	0	Combined BMPs
W2-Pasture	0	0	0	0	Combined BMPs
W3-Pasture	0	0	0	0	Combined BMPs
W4-Pasture	0	0	0	0	Combined BMPs
W1-Forest	0	0	0	0	Combined BMPs
W2-Forest	0	0	0	0	Combined BMPs
W3-Forest	0	0	0	0	Combined BMPs
W4-Forest	0	0	0	0	Combined BMPs
W1-User	0	0	0	0	Combined BMPs
W2-User	0	0	0	0	Combined BMPs
W3-User	0	0	0	0	Combined BMPs
W4-User	0	0	0	0	Combined BMPs

**Total Load** This is the summary of annual nutrient and sediment load for each subwatershed. This sheet is initially protected.

1. Total load by subwatershed(s)

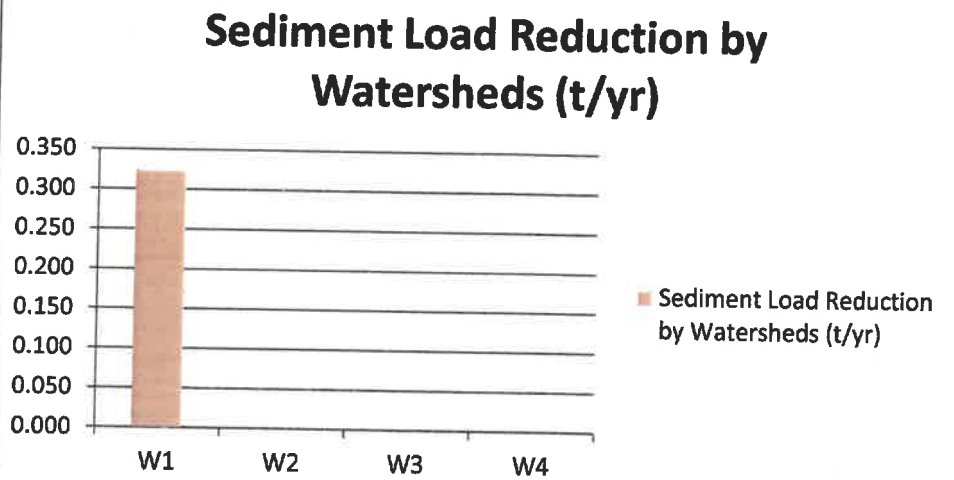
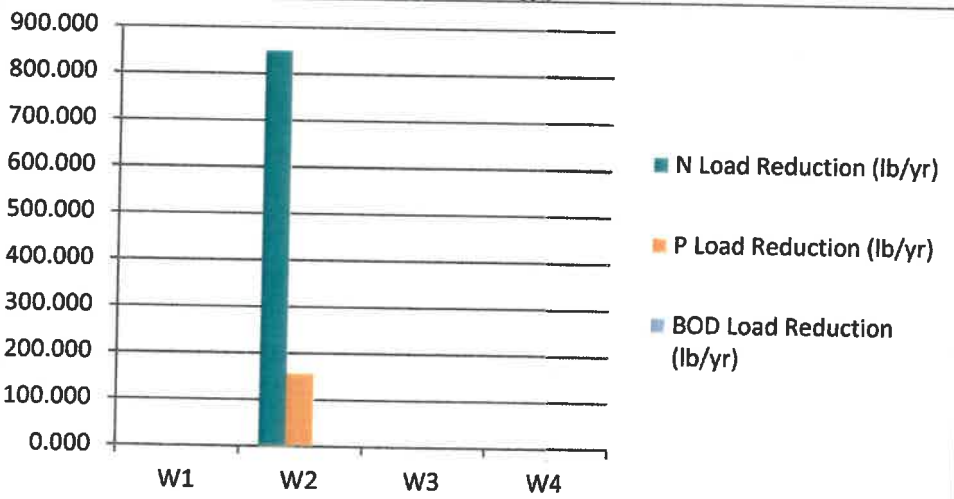
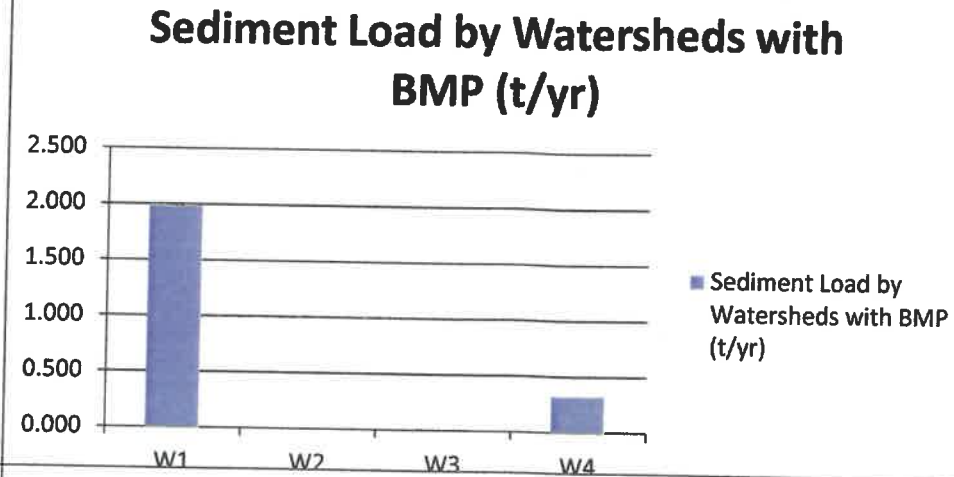
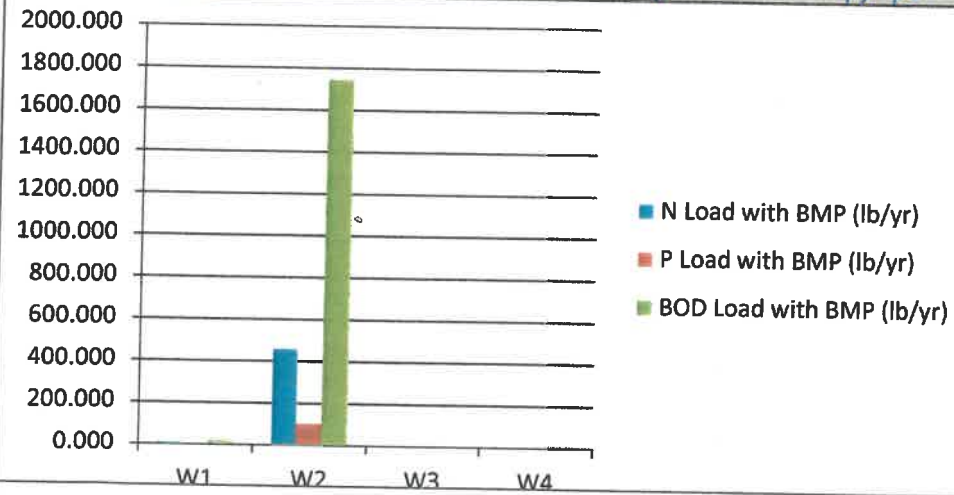
Watershed	N Load (no BMP)	P Load (no BMP)	BOD Load (no BMP)	Sediment Load (no BMP)	N Reduction	P Reduction	BOD Reduction	Sediment Reduction	N Load (with BMP)	P Load (with BMP)	BOD (with BMP)	Sediment Load (with BMP)	%N Reduction	%P Reduction	%BOD Reduction	%Sed Reduction
	lb/year	lb/year	lb/year	t/year	lb/year	lb/year	lb/year	t/year	lb/year	lb/year	lb/year	t/year	%	%	%	%
W1	9.8	3.2	19.9	2.3	1.1	0.4	2.1	0.3	8.7	2.8	17.9	2.0	11.5	13.8	10.4	14.0
W2	1306.8	261.4	1742.4	0.0	849.4	156.8	0.0	0.0	457.4	104.5	1742.4	0.0	65.0	60.0	0.0	0.0
W3	0.6	0.1	2.3	0.0	0.0	0.0	0.0	0.0	0.6	0.1	2.3	0.0	0.0	0.0	0.0	0.0
W4	3.3	0.6	9.5	0.3	0.0	0.0	0.0	0.0	3.3	0.6	9.5	0.3	0.0	0.0	0.0	0.0
Total	1320.5	265.3	1774.1	2.6	850.5	157.3	2.1	0.3	470.0	108.0	1772.1	2.3	64.4	59.3	0.1	12.2

2. Total load by land uses (with BMP)

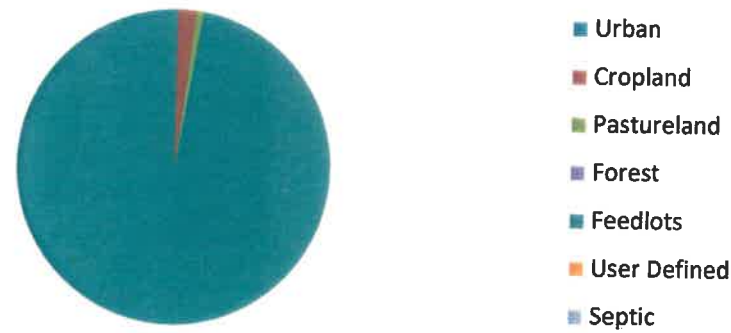
Sources	N Load (lb/yr)	P Load (lb/yr)	BOD Load (lb/yr)	Sediment Load (t/yr)
Urban	0.60	0.09	2.31	0.01
Cropland	8.70	2.78	17.86	1.98
Pastureland	3.33	0.58	9.53	0.33
Forest	0.00	0.00	0.00	0.00
Feedlots	457.37	104.54	1742.38	0.00
User Defined	0.00	0.00	0.00	0.00
Septic	0.00	0.00	0.00	0.00
Gully	0.00	0.00	0.00	0.00
Streambank	0.00	0.00	0.00	0.00
Groundwater	0.00	0.00	0.00	0.00
Total	470.01	107.99	1772.06	2.32

# Graphs

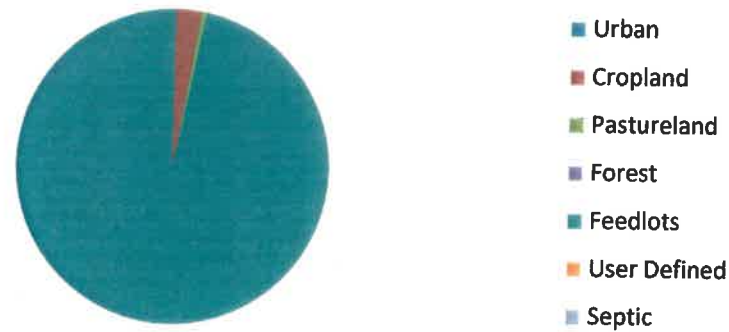
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**Total N Load by Land Uses (with BMP) (lb/yr)**



**Total P Load by Land Uses (with BMP) (lb/yr)**

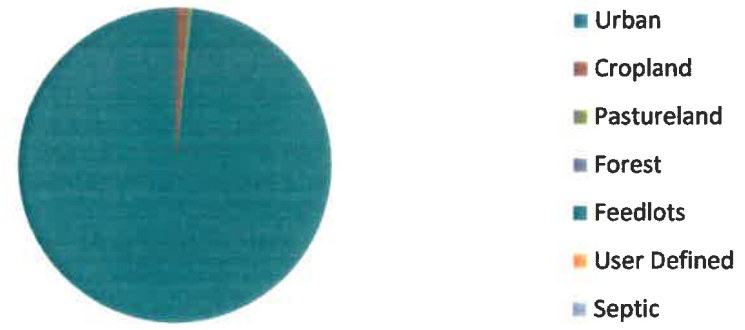


**Total BOD Load by Land Uses (with RMD) (lb/yr)**

**Total Sediment Load by Land Uses (with RMD) (t/yr)**



(10/yr) BIVR



(4/yr) BIVR (with)



## Urban Human MMP and Polluted-Land Radiation

Urban BMP Tool

**Close**

## Urban pollutant concentration in runoff (mg/L)

Landuse	Commercial	Industrial	Institution	Transport	Multi-Fam	Single-Fam	Urban-Cult	Vacant	Asp/Open Space
TN	2	2.3	1.4	3	2.3	2	1.9	1.3	1.8
TP	0.2	0.4	0.3	0.2	0.4	0.4	0.3	0.1	0.1
BOD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TSS	15	120	40	150	150	100	100	100	100

### 3. Uniform random distribution

Landmark	Commercial	Institutional	Transit	Multifamily	Single-Family	Urban Core	Vacant	Open Space
W1	0	0	0	0	0	0	0	0
W2	0	0	0	0	0	0	0	0
W3	0.015	0.01	0.01	0.01	0.01	0.01	0.006	0.005
W4	0	0	0	0	0	0	0	0

### 1. Selection criteria: H&M's

[illegible]

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[illegible]

## 24. Effective BMP application area (ac)

Landuse	Commercial	Industrial	Institution	Transport	Multi-Fam	Single Fam	Urban-Cult	Variat (as Open Space)
W1	0	0	0	0	0	0	0	0
W2	0	0	0	0	0	0	0	0
W3	0.015	0.01	0.01	0.01	0.01	0.01	0.005	0.005
W4	0	0	0	0	0	0	0	0

## Sa. Percentage of HSP effective area (%)

Vehicle	Construction	Insulation	Transport	Multi-Fam	Single-Fam	Median-Gov	Vegetation/Open Space
W1	0	0	0	0	0	0	0
W2	0	0	0	0	0	0	0
W3	100	100	100	100	100	100	100
W4	0	0	0	0	0	0	0

Pre-implementation of BMP's







Post-implementation of BMP's

Diversions:





Roof Gutters:







Manure Storage Structure:

