M & P Project No. 14-160

-WATER QUALITY TRADING PLAN-

for

City of Greenwood Wastewater Treatment Facility

City of Greenwood Wisconsin

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SECTION I - INTRODUCTION

A. EXECUTIVE SUMMARY:

The City of Greenwood proposes to extend their existing Water Quality Trading Plan to meet the phosphorus limit requirements of the WPDES Permit as follows:

- The permittee may use water quality trading to demonstrate compliance with WQBELs for total phosphorus (TP) of 0.225 mg/L monthly average (compliance determined beginning with start date of permit issuance) and 0.075 mg/L 6-month average and 0.33 lbs/day 6-month average (compliance determined beginning December 31, 2019, and each December 31 and June 30 annually thereafter).

The city is currently working with area farmers to reduce agricultural phosphorus runoff. Multiple parcels are included in this trade which generates the required credits. The trading plan focuses on the whole field management approach with an active dairy farmer, and also conversion of fields with row crops to permanent perennial vegetation with a former dairy farmer and absentee landowner.

The phosphorous that is discharged in the effluent of the Greenwood WWTF is significantly influenced by a Greenwood Milk Products, GMP, a dairy that is located within the city. GMP is owned and operated by Grassland Dairy. Grassland Dairy is currently operating GMP on an as needed basis only. Grassland Dairy does not have a specific schedule of operation. Operation depends upon breakdowns at Grassland Dairy's main facility, availability of milk, and product demand. When GMP is not in operation, Greenwood's WWTF, can consistently discharge effluent at $\leq$ 0.3mg/l. total phosphorous. If GMP is operating with a continuous discharge, Greenwood's WWTF effluent can increase to over 0.8 mg/l. total phosphorous. The minimum control level for phosphorous discharge in the WPDES is 1.0 mg/l. A trading ratio of 1.2:1 was determined to be applicable for this trading plan.

Pounds of phosphorous above the WPDES limit will be mitigated under this extended plan; under the original plan, phosphorous credits were traded as follows:

Year	Available Credits	Credits Traded	Credits Remaining
2019	1190	66.29	1123.71
2020	1174	277.52	829.82
2021	1110	179.13	930.87
2022	1384	217.28	884.72
2023	1193	348.65	844.35

The above table shows that excess credits were available each year of the last permit term. Due to the uncertainty of GMP operational schedule, the city will continue to maintain excess credits in the event GMP goes back into production. The city will obtain additional phosphorous credits if needed due to GMP or if there is a practice failure with one of the trading partners.

B. BACKGROUND AND NEED:

(Please refer to the previous phosphorous compliance reports for a more complete discussion).

The City of Greenwood's WWTF is considered a Regional Facility in that it also treats the wastewater from the City of Loyal. Additionally, the Greenwood WWTF receives pretreated wastewater from Greenwood Milk Products, GMP, owned by Grassland Diary, plus septage and trucked in wastewater. Greenwood's WWTF has little control over the residential influent, but is working with Greenwood Milk Products to improve the quality of the pretreated wastewater that is received from the Dairy. The City has a longstanding Agreement with the Dairy that addresses flow and wastewater strength. That Agreement has undergone numerous updates and amendments. Currently the Dairy is operating under an expired Agreement. The City and Dairy are working together to amend the Agreement to provide financial incentives to the Dairy to optimize phosphorus treatment.

Previous reports investigated influent: flow, SS, BOD and phosphorus, to predict WWTF capability and response regarding phosphorous removal. It is difficult, if not impossible, to single out an individual component that is controlling. Since the waste stream from Greenwood Milk Products is variable as is the influent flow from Greenwood and Loyal, the best that can be expected is to identify a general trend of one or more components that significantly affect the effluent phosphorus concentration. Please refer to Attachment D of the 4th Report. The City will continue to monitor the influent wastewater components that are shown on the graphs to maximize treatment.

The Greenwood WWTF has a maximum monthly design flow of 0.75 MGD and 1869 pounds of BOD. No information is available on the design capacity for suspended solids or phosphorus. However, past practice indicates that Greenwood's WWTF can achieve a 0.3 mg/l average of phosphorous when Greenwood Milk Products is not operating. If the City met 0.3 mg/l phosphorus in the effluent 375 pounds of phosphorus credits would be required through WQT to meet the final WPDES limit.

SECTION II - WATER QUALITY TRADING

A. PURPOSE:

This Water Quality Trading Plan for phosphorous will be used by the City of Greenwood to comply with present and future WPDES permit requirements for effluent phosphorous. The City will continue to discharge to the Black River, but will offset the discharge limit exceedances for phosphorous at the outfall by crediting the nonpoint discharge phosphorous runoff reductions from agricultural cropland. The agricultural practices on the cropland will be modified to reduce the phosphorus discharge from cropland.

The cropland will be modeled with SnapPlus, under the current management system and again with the proposed practices implemented to reduce phosphorus runoff.

Credits generated by the non-point source will be traded by the City to comply with their WPDES Permit.

B. LOCATION OF THE OUTFALL:

The City of Greenwood discharges from its WWTF outfall to the Black River at approximate latitude 44.76156°, longitude 90.61263°. The discharge point is located in HUC 12, number 070400070405

C. TRADING PARTNERS:

Following are three separate Trading Partners. An individual plan has been prepared for each partner and is included under the applicable section.

Trading Partner	Individual Trading Plan: Refer to Section	Average Tradeable Phosphorous in pounds (see actual yearly value)
Malm Farm	C1	1119
Wayne Riethmiller	C2	166
Patti Suda	C3	63
Total		1348 Pounds per year

C-1 Trading Partner Plan

Robert & Mitch Malm

C-1 TRADING PARTNER: MITCH MALM FARM

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B. Malm Farm Map And Soils Map

C. 590 Checklist

D. Cover Crop Technical Notes:

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F. Malm Farm Discharge Point

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H. DNR Trade Ratio Calculation

I. Operation and Maintenance Manual

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L. Certification of Section C-1 of the Water Quality Trading Plan

REFERENCE DOCUMENTS:

WQT-2019-006

Water Quality Trading Amendment 1

C-1 <u>TRADING PARTNER</u>: ROBERT AND MITCH MALM

A. **EXECUTIVE SUMMARY:** Robert and Mitch Malm were trading partners in WQT-2019-006 and wish to continue trading phosphorus credits with the City of Greenwood in the following permit term, under WQT Plan #2. The farm is located in HUC 12's that discharge into the Black River downstream of the WWTF outfall. The farm consists of approximately 115 lactating Dairy cows, associated youngstock and approximately 550 tillable acres. Under WQT-2019-006 the farm implemented the Whole Field Management approach with no-till, cover crops, field edge and riparian vegetated filter strips. Under Water Quality Trading Plan-Amendment 1 an additional field purchased by the farm was added, also using the Whole Filed Management Approach. The City of Greenwood and Malm Farm entered into a Water Quality Trading Agreement in 2019 for two permit terms, the second permit term was set at 970 lb. of phosphorus credits for the base farm as described in WQT-2019-006. Water Quality Trading Plan-Amendment 1 generated on average 158 lb. per. year. WQT Plan #2 will continue the Whole Field Management approach. Credits are calculated as the difference between phosphorus lost under baseline practices and phosphorus lost under the proposed practices. The Baseline for Malm farm was established in WQT-2019-006 and Water Quality Trading Plan – Amendment 1. The proposed 2024-2028 crops were modeled in SnapPlus with, no till, cover crops as applicable, field edge and riparian vegetated filter strips. The difference between phosphorus lost under baseline practices and phosphorus lost under the proposed practices was compared to ensure that the credits contained in the agreement (970 lb.), and the credits contained Water Quality Trading Plan-Amendment 1 (158 lb.) could be maintained with the proposed practices 2024-2028. Table 6 summarizes annual Phosphorus credit generation with proposed practices 2024-2028. This plan proposes to be conservative and honor the 970 lb. and 158 lb. credit previously established for this permit term.
The total tradable phosphorus credits claimed by WQT plan #2 will be 970 lb. + 158 lb. =1128 lb. per year. Except for 2024, the filter strips will be installed in field Gideon upon approval by the DNR, the credit deduction in 2024 will be the difference between (PTP under no till 88 lb. and PTP under no till and filter strips 34 lb.) /1.2= 45 lb. (1128 lb-45 lb = 1083 lb.) phosphors credits in 2024.

B. **LOCATION OF AGRICULTURAL PROPERTY**: The Malm Farm is located in the following HUC 12's: 070400070403, 070400070402, and 070400070401, which discharge into the Black River through Rock Creek. Rock Creek enters the Black River approximately 250' south of the WWTF outfall. The property generating the Phosphorus Credits is located upstream of the City of Greenwood. The fields are located in Section 19, 20, 27, 28, & 29, T27N-R1W, Town of Beaver, Clark County. Attachment A shows the drainage area's HUC 12 map and Attachment B shows an aerial view of the Malm Farm.

C. **FARMING OPERATION:** The Malm Farm is under the management of Robert and Mitch Malm. The farm is an active dairy farm with a supplement of cash row crops.

D. **WQT-2019-006 EXISITNG CONDITIONS-BASELINE PHOPSHOUS:** SnapPlus was used to create a baseline of phosphorus discharge from the Malm farm for WQT-2019-006. The SnapPlus file used to generate the baseline/existing conditions of the Malm Farm was provided by Northside Elevator. Northside Elevator drafts and maintains an approved Nutrient Management Plan for the Malm farm. The Malm farm baseline consists of approximately 505 tillable acres. The farm was home to a continuous milking herd of approximately 115 cows plus associated dry cows, young stock and dairy steers. The

manure from the dairy herd and steers was applied to the farmland through a nutrient management plan. The farm practiced conservation tillage for seedbed preparation. The primary crop grown was corn both for grain and silage. The remainder of the farm is seeded to soybeans and forage crops.

1. **SOIL SAMPLING:** Soil sampling was performed in accordance with the farm's nutrient management plan. Soil samples were collected by Northside Elevator Inc. in accordance with UWEX Publication A2100. All soil samples were tested by Dairyland Labs. The entire farm was sampled in the fall of 2016 with the exception of two fields that were added to the farm in 2017; they were sampled in April of 2017. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged by Dairyland Labs to create a single recommendation for that field. See Attachment C of WQT-2019-006 for results.

2. **CROPLAND:** There were 505± tillable acres on the Malm Farm. In the 2017 crop year: 69 acres were seeded to alfalfa, 38 acres of established alfalfa, 181 acres of soybeans, and 217 acres of corn, 73 acres of which were chopped for silage. In the 2016 crop year: 124 acres of established alfalfa, 128 acres of soybeans, 38 acres of Cereal Rye, and 216 acres of corn, 89 acres of which were chopped for silage.

3. **PREVIOUS 2 YEARS OF CROPPING HISTORY (2016-2017):** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and SnapPlus cropping history was made for 2016 and 2017. SnapPlus cropping history for 2017 and the Cropland Data Layer were in substantial agreement. The SnapPlus cropping history file for 2016 differed from CropScape, for 4 fields: BE, D1, G-1, and G-2. Mitch Malm verified that Cropland Data Layer for those fields likely was correct. The 4 affected fields were adjusted to agree with the Cropland Data Layer for crop type. The nutrient application on those fields was also adjusted. Note in 2016 Malms did not have fields David North and David South. In the 2016 crop year: 124 acres of established alfalfa, 128 acres of soybeans, 38 acres of Cereal Rye, and 216 acres of corn, 89 acres of which were chopped for silage. In the 2017 crop year: 69 acres were seeded to alfalfa, 38 acres of established alfalfa remained, 181 acres of soybeans, and 217 acres of corn, 73 acres of which were chopped for silage.

4. **CONDITIONS TO BE PROJECTED TO YEARS 2018-2023:** The nutrient applications, cropping and tillage data from the 2018 SnapPlus file from Northside, were used for 2018 with the exception of fields that had crop type changes since the nutrient management plan was drafted. The Malm farm planned to transition to more Alfalfa and add Italian Rye Grass into the rotation. These changes were included in the projection of existing cropping to provide a more conservative estimate of phosphorous credits generated and also in the event that these changes were not be continued for the full term of WQT-2019-006. Italian Rye Grass is not included as a crop option in the SnapPlus database and no other crop closely matches its growth habits, with rapid early season growth in the seeding year and also regrowth the following year (winter annual), prior to termination. For modeling purposes Sorghum-Sedan grass was entered in place of Italian Rye Grass in SnapPlus. This selection is conservative because Italian Rye Grass will overwinter and act as a living cover crop whereas Sorghum-Sedan Grass is a warm season annual. Nutrients used by the 2 crops will be similar when ryegrass is harvested in the second year prior to termination.

5. **TILLAGE:** Tillage practices previously entered into SnapPlus were continued for the 2018-2023 projected rotation. For the 2018-2023 projected rotation the general rules were followed: spring cultivation was used for corn following beans, spring chisel plowed without disking was used for soybeans following corn, and fields coming out of or going into alfalfa or Italian Rye Grass were spring chisel plowed and disked.

6. **ROTATION:** A standard rotation was not followed on this farm. The rotation for the farm was adjusted on a field by field basis, as needed, due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, and other environmental factors. The theoretical rotation consisted of corn, soybeans, corn, soybeans, alfalfa seeded, and then alfalfa for three years. The 2018-2023 projected rotation was laid out by Malm as their plan, but was subject to adjustments on a field by field basis, as stated. The rotation length was set as 2016-2023. This is less than a complete rotation, but meets T, soil test P and PI index for the shortened rotation. Malms try to keep a field in alfalfa for 5 years instead of 3.

7. **CONCENTRATED FLOW CHANNELS:** Concentrated flow channels were mapped by North Side elevator in SnapPlus, for fields AN, AS, BE, David North, EF, G-1, and H-1 will remain in place.

8. **NUTRIENTS FROM MANURE:** Manure spreading rates and time of year, vary based upon weather conditions and time constraints. Liquid manure is stored in a pit to be spread primarily in the spring and fall, with some summer application. Note: there was a change in the liquid manure total from 2017-2018. The percent of manure from the dry cows that was collected went from 75% to 100%.

   - Liquid Manure Sources: The farm, on average, milks 115 cows and has 30 dry cows. For purposes of calculation, all cows will weigh 1400 pounds. Dairy calves are also held in 100% confinement. On average, the farm will house approximately 10 calves up to 150 lbs. and 20 150-250 lbs. The dilution factor of the manure will be assumed at 1.8.

     Using UW Extension guidelines:

     - 1400 lb. Dairy Cow produces 17.7± gal. of manure per day x 1.8 = 32 gal.
     - 1400 lb. Dry Cow produces 13.6± gal. of manure per day x 1.8 = 25 gal.
     - 150 lb. Dairy Calf produces 1.53 ± gal. of manure per day x 1.8 = 2.8.gal.
     - 250 lb. Dairy Calf produces 2.47± gal. of manure per day x 1.8 = 4.5 gal
     - [(365 days x 32 gal x 115) + (365 days x 25 gal. x 30) + (365 days x 2.8 gal. x 10) + (365 days x 4.7 gal. x 20)]. = 1,660,000 gal. liquid manure

     Verification Check: Malms use a custom manure application company, the invoice for spreading from 11-22-17 listed: 40 loads with a 7400 gal. tanker
     49 loads with a 7400 gal tanker
     49 loads with a 5700 gal tanker
     ((40x7400) + (49x7400) + (49x5700)) = 938,000

     The manure pit was last spread in late March of 2017.

March to the end of November = 8 months / 12 months x 1,660,000 gal.
Calculated production = 1,107,000 gal.
This is within 15% of the spread amount.

- Solid Manure Sources: Manure from dairy heifers and steers is collected as solid manure. The farm, on average houses 45 dairy heifers weighing approximately 750 lbs. and 25 dairy heifers weighing approximately 1000 lbs., to be used as replacements in the dairy herd. The farm also retains bull calves to raise as steers. For calculation purposes: 30-750 lb. steers and 50-1000 lb. steers are going to be used. The steers and heifers are located in separate confinements and feed lots. The amount of collected manure is estimated at 80% for steers and 60% for heifers.

  Using UW Extension guidelines, manure production for each animal group is:

  - 750 lb. Dairy Heifer produces 65 lb. of solid manure per day
  - 1000 lb. Dairy Heifer produces 82 lb. of solid manure per day
  - 750 lb. Steer (beef high forage) produces 62 lb. of solid manure per day
  - 1100 lb. Steer (beef high forage) produces 92 lb. of solid manure per day
    (365 days x 45 x 65 lb. x .6/2000) + (365 days x 25 x 82 lb. x .6/2000) + (365 days x 30 x 62 lb. x .8/2000) + (365 days x 50 x 92 lb. x .8/2000) = 1500 ton.

9. **CORN PRODUCTION**: The following nutrient application data was the theoretical standard for the Malm farm for corn in the 2018-2023 projected rotation. See Attachment C from WQT 2019-006 for specific field application data. The yield goal was 151-170 bu. per. acre grain corn and 20-25 ton silage.
   - Commercial starter fertilizer 180 lb. per acre of 15-11-25
   - 28% UAN liquid 5-20 gal. per acre (based upon manure application and 2nd year nitrogen credits)
   - Manure 10,000 gal. per acre 7-6-17; based upon UW standard values @ 6% dry matter.
   - Theoretical total application to the crop 142-80-215 pounds per acre, not including any N credits
   - Theoretical crop removal in grain 140-60-45 pounds per acre (N requirement varies based upon soil and MRTN price ratio)
   - Theoretical crop removal in silage 140-80-185 pounds per acre (N requirement varies based upon soil and MRTN price ratio)
10. **SOYBEAN PRODUCTION:** The following nutrient application data was the theoretical standard for soybeans in the 2018-2023 projected rotation. See Attachment C of WQT-2019-006 for specific field application data. The yield goal is 45-55 bu. per. acre
    - 75 lb. DAP 18-46-0 = 14-35-0 pounds per acre
    - 50 lb. Gypsum 0-0-0-17s-22c pounds per acre
    - 175 lb. Potash 0-0-60 = 0-0-105 pounds per acre
    - Theoretical total application to the crop 14-35-105 pounds per acre, not including any N credits
    - Theoretical crop removal in grain NA-40-70 per acre

11. **SORGHUM-SUDAN (ITALIAN RYE GRASS) FORAGE PRODUCTION:** The following nutrient application data was the theoretical standard for Sorghum-Sudan in the 2018-2023 projected rotation. See Attachment C of WQT-2019-006 for specific field application data. The yield goal is 5-7 ton. per. acre
    - Spring 25 Ton solid manure 2-3-6 =5 0-75-150 pounds per acre
    - Summer 4000 gal Liquid manure 7-6-17 = 28-24-68 pounds per acre
    - Theoretical total application to the crop 78-99-218 pounds per acre, not including any N credits
    - Theoretical crop removal 100-100-400 pounds per acre

12. **ALFALFA:** The following nutrient application data is the theoretical standard for Alfalfa in the 2018-2023 projected rotation. See Attachment C of WQT-2019-006 for specific field application data. The yield goal is 4.6 - 5.5 ton per. acre. Alfalfa was the nutrient drawdown crop in the rotation, P-K are under- applied on a yearly basis when fields are in alfalfa.
    - 50 lb. DAP 18-46-0 applied late spring and again late summer = 18-46-0 pounds per acre
    - 50 lb. Gypsum 0-0-0-17s-22c applied late spring and again late summer = 0-0-0-17s22c pounds per acre
    - 200 lb. Potash 0-0-60 applied late spring and again late summer 0-0-120 x 2=0-0-240 pounds per acre
    - Theoretical total application to the crop 18-46-240 pounds per acre, not including any N credits
    - Theoretical crop removal in alfalfa NA-65-300 pounds per acre

13. **POTENTIALLY TRADEABLE PHOSPHORUS UNDER WQT-2019-006 EXISITNG CONDITIONS (BASELINE PHOPSHOUS):** SnapPlus Modeling was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model 17 fields under 2018-2023 projected management practices as described above. The projected management: crops and nutrient applications were modeled to 2023 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The baseline was established as part of WQT-2019-006. The baseline years of 2019-2023 will be brought forward to years 2024-2028. See WQT-2019-006 for SnapPlus reports.

TABLE 1 – Malm Farm 2018-2023 Projected Existing Conditions from WQT-2019-006 (Baseline)

Farm Existing Conditions	Field	Soil Series	Soil Sym.	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
Malms Rolling Acres	AN	LOYAL	LoB	19.5	141	46	125	153	46	117
Malms Rolling Acres	AS	WITHEE	WeA	16.9	61	20	60	62	20	56
Malms Rolling Acres	BE	LOYAL	LoB	38.0	104	283	98	229	85	149
Malms Rolling Acres	BW1	LOYAL	LoB	25.0	54	120	197	56	161	59
Malms Rolling Acres	BW2	LOYAL	LoB	23.0	65	120	182	53	147	177
Malms Rolling Acres	BWN	LOYAL	LoB	35.0	83	178	175	79	218	82
Malms Rolling Acres	C1	LOYAL	LoB	20.6	53	144	66	138	183	53
Malms Rolling Acres	C2	LOYAL	LoB	17.0	46	118	47	112	148	42
Malms Rolling Acres	C3	LOYAL	LoB	32.0	45	24	131	178	224	230
Malms Rolling Acres	C4	LOYAL	LoB	6.0	8	5	28	38	46	48
Malms Rolling Acres	D1	LOYAL	LoB	58.4	327	580	401	509	492	80
Malms Rolling Acres	David North	LOYAL	LoB	16.0	93	38	26	16	9	63
Malms Rolling Acres	David South	LOYAL	LoB	33.0	160	63	42	26	14	116
Malms Rolling Acres	EF	LOYAL	LoB	69.2	183	126	79	44	207	392
Malms Rolling Acres	G-1	LOYAL	LoB	46.6	257	288	263	53	29	15
Malms Rolling Acres	G-2	LOYAL	LoB	7.3	42	48	42	9	5	2
Malms Rolling Acres	H-1	HILES	HeB	41.8	200	62	164	84	102	194
Total				**505.3**	**1922**	**2263**	**2126**	**1839**	**2136**	**1875**

E. WATER QUALITY TRADING PLAN AMENDMENT 1-EXISTING CONDITIONS.

After WQT-2019-006 was submitted to the DNR, Malm Farm acquired an additional 38 acre field (hereinafter known as Gideon's field or field Gideon). A Water Quality Trading Plan – Amendment was prepared and submitted to the DNR for approval. The baseline existing conditions from that plan are included below for field Gideon. SnapPlus was used to create a model of the existing farm operation of Gideon. The existing operation was based upon standard Amish farming practices and an interview with Mitch Malm. Gideon's field was formerly managed by an Amish dairy farmer. His farm consisted of 80 acres with approximately 46 acres in cropland the remainder being pasture and farm site. The farm was home to a milking herd of approximately 10 cows plus associated dry cows, young stock and horses. Manure from the dairy farm was spread on the cropland as dictated by convenience. Primary crops grown were corn, alfalfa, and oats.

1. **SOIL SAMPLING:** Soil samples were collected by Northside Elevator Inc. in accordance with UWEX Publication A2100. All soil samples were tested by Dairyland Labs. The soil test for Gideon's field is dated 11/21/2019. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. See Attachment C of Amendment 1 for results for Gideon's field. The averaged sample results from Gideon's field are used for each individual strip S01-S04. Using averaged sample results from Gideon's field approximates actual samples of each strip, because all individual samples had Phosphors results between 9-15 PPM.

2. **CROPLAND:** The Amish dairy farm consisted of 46 ±acres split between corn, alfalfa, and oats or oats with new seeding. Only 38 acres of the former farm are included in this trade, the remaining 8 acres will be included in this narrative to show the entire farm rotation was prepared without bias. The existing Amish dairy farm split Gideon's field into four smaller fields: Gideon S01, S02, S03 and S04. The 8 acre field not included in the trade will be referenced as "Excluded 8ac. Field Excluded 8 was seeded to corn in 2018 & 2019, and received manure from Gideon's herd. This was taken into account when manure volumes were tallied for Gideon

3. **PREVIOUS 2 YEARS OF CROPPING HISTORY (2017-2018):** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape), aerial imagery, and an interview with Mitch Malm, lead to a cropping history for 2017 and 2018. The field was cropped by Gideon in a minimum of four strips 330'± wide, fields Gideon S01, S02, S03 and S04. The crop land data layer will not allow accurate identification of fields that small, so aerial imagery and Mitch Malm, were used to as a supplement.

4. **ROTATION:** A theoretical projected rotation (2019-2023) was prepared using corn, alfalfa, and oats or oats with new seeding. The previous crop history averaged 15-20 acres Corn each year, 15-20 acres of alfalfa each year, and 10 acres of oats or oat new seeding. The projected rotation closely follows the historical crop acreage requirements but is adjusted to allow an Alfalfa stand to be harvested for three years.

	2017	2018	2019	2020	2021	2022	2023
S01 10.1 ac.	Corn	Oats	Oats	Alfalfa	Alfalfa	Alfalfa	Corn S.
S02 9.8 ac	Corn S.	Corn	Corn S.	Corn	Oats	Alfalfa	Alfalfa
S03 7.3 ac	Alfalfa	Alfalfa	Alfalfa	Corn S.	Corn	Corn S.	Oats
S04 10.5 ac	Oats	Alfalfa	Alfalfa	Alfalfa	Corn S.	Corn	Corn
Exc. 8ac.	Alfalfa	Corn S.	Corn	Oats	Alfalfa	Alfalfa	Alfalfa

5. **CROP MANAGEMENT:** As laid out above primary crops are Corn, Alfalfa, Oats and Oats as a nurse crop for alfalfa. Corn was harvested as both silage and grain, Corn for silage was removed from the field as shocks, corn for grain was picked and the stocks were removed from the field.

6. **TILLAGE:** The standard primary tillage practice of Amish in Clark County is still moldboard plowing. Draft horses are the primary power source, which also leads to the use of moldboard plows. The moldboard plow pass was assumed to be a spring pass although fall plowing may still have been practiced.

7. **NUTRIENTS FROM MANURE:** The former Amish dairy farm was home to approximately 10 milk cows, 4 replacement heifers, and 8 horses. For the sake of calculation all animals will be confined indoors Nov.1-May 15 during this time 100% of the manure will be collected and stockpiled or spread directly on the crop land. To be conservative winter spreading will not be modeled within snap plus although the practice would have taken place when snow cover would allow. Manure applied was modeled as unincorporated because the manure would not have been incorporated within 72 hours. The dairy herd and horses were on pasture as seasonal conditions allowed, May 16-Oct 31, 0% manure collected.

- Dairy herd:10 milking cows confined indoors Nov 1-May 15, for purposes of calculation, 8- 1400 pound cows will be in their 2nd lactation and 2- 1200 pound cows will in their first lactation. Using UW Extension guidelines:
  - 1400 lb. Dairy Cow Produces 148± lb. of manure per. day
  - 1200 lb. Dairy Cow Produces 127± lb. of manure per. day
  - [(170 days x 148 lb. manure x 8) + (170 days x 127 lb. manure x 2)]/2000 lb.= 120 ton of manure

- Dairy replacements: 4 heifers, confined indoors Nov 1-May 15.
  - (1 - 250 lb. heifers x 21± lb. of manure per day x 170 days)/2000lb.=2 ton
  - (1 - 500 lb. heifers x 42± lb. of manure per day x 170 days)/2000lb.=4 ton
  - (2 - 750 lb. heifers x 65± lb. of manure per day x 170 days)/2000lb.=11 ton

- Horses: 8 horses confined indoors Nov 1-May 15.
  - (8 - 1000 lb. horses x 50± lb. of manure per day x 170 days)/2000lb.=34 ton

8. **CROP PRODUCTION:** Yield goals and nutrient application records are unavailable. Crop yield goals were established by using NASS County Yield estimates for Clark County: Corn Grain 123 bu. Per ac., Corn Silage 13.5 ton. Per. ac., Alfalfa hay 2.35 ton. Per. ac., Oats 59 bu. Per. ac. The fact that existing soil test levels are low and Amish are typically low cost producers, leads to the conclusion that nutrient applications were minimal. Nutrient applications were modeled at or below crop nutrient removal (for the entire rotation) at NASS yields.

   CORN PRODUCTION The following nutrient application data was the theoretical standard for the Amish farm, for corn in the projected 2019-2023 rotation. The yield goal was 123 bu. per. acre grain corn and 13.5 ton silage. The seedbed for planting corn was prepared by Moldboard plowing and disking

   - Theoretical crop removal in 123 bu. grain and 2.5 ton of stover, 130-58-116
   - Theoretical crop removal in silage 13.5 ton, 130-49-112
   - Manure 10 ± ton manure (horse and dairy combined) 20-34-60 total application at UW standard values
   - Commercial starter fertilizer 100 lb. per ac. 9-23-30
   - Side dress nitrogen 200lb. per ac. urea 46-0-0 = 92-0-0 (alfalfa stand removal year, receives no side dress nitrogen)
   - Theoretical total application to the crop 121-57-90 not including any 2nd. year nitrogen credits.

   OAT PRODUCTION: The following nutrient application data was the theoretical standard for Oats including Oats seeded with Alfalfa in the projected 2019-2023 rotation. The yield goal was 59 bu. per. acre including straw removal.

   - Theoretical crop removal in 59 bu. of oats and straw 40-27-58
   - 50 lb. DAP 18-46-0 = 9-23-0 pounds per acre
   - 100 lb. Potash 0-0-60 = 0-0-60 pounds per acre
   - Theoretical total application to the crop 9-23-60 pounds per acre, not including any N credits.

   ALFALFA: The following nutrient application data was the theoretical standard for Alfalfa in the projected 2019-2023 rotation. The yield goal is 2.35 ton per. acre.

   - Theoretical crop removal in 2.35 ton NA-31-141
   - 60 lb. DAP 18-46-0 = 11-28-0
     = 18-46-0 pounds per acre
   - 200 lb. Potash 0-0-60= 0-0-120
   - Theoretical total application to the crop 11-28-120 pounds per acre.

9. **POTENTIALLY TRADEABLE PHOSPHORUS UNDER EXISITNG CONDITIONS FROM AMENDMENT 1 (BASELINE):** SnapPlus Modeling was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model 4 fields under 2019-2023 projected management practices. The projected management: crops and nutrient applications were modeled out to 2023 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The baseline years of 2019-2023 will be brought forward to years 2024-2028. See Water Quality Trading Plan – Amendment 1 for SnapPlus reports.

TABLE 2 – (2019-2023) PTP Projected Existing Conditions from Amendment 1 (Baseline)

Farm	Field	Acres	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
			2024	2025	2026	2027	2028
Malms	Gideon [S01]	10.1	45	7	9	7	63
Malms	Gideon [S02]	9.8	96	108	32	7	9
Malms	Gideon [S03]	7.3	2	48	69	70	28
Malms	Gideon [S04]	10.5	12	9	93	140	130
Total		**37.7**	**156**	**172**	**203**	**224**	**230**

F. CREDIT GENERATION - PROPOSED OPERATING CONDITONS OF THE FARM: After WQT-2019-006 was approved Malm farm installed or implemented the practices laid out in WQT-2019-006, consisting of reduction of tillage, installing vegetated buffers, and seeding a cover crop following silage corn. The City and Malm Farm would like to continue generating phosphorus credits with the same practices through WQT Plan #2. The following section provides current projected operating conditions of the farm to be modeled through SnapPlus, for the purpose of verification that practices previously applied are still reducing phosphorus leaving the farm.

1. **SOIL SAMPLING:** Soil sampling is performed in accordance with the farm's nutrient management plan. Soil samples are collected by Northside Elevator Inc. in accordance with UWEX Publication A2100. The entire farm was sampled in the fall of 2020 with the exception of two fields Gideon which was tested on 12-05-2024 and Miller which was sampled 10-13-2022. The farm will be sampled again in the fall of 2024 to remain in compliance. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged by the Lab to create a single recommendation for that field. See Attachment C for results.

2. **CROPLAND:** There are 555± tillable acres on the Malm Farm. Field David North and South were added in 2017, Field Gideon was added in 2019, and Field Miller was added in 2022. Field Gideon was not part of WQT 2019-006, Water Quality Trading Plan Amendment 1 was submitted to the DNR to add Field Gideon. Field Miller will be included in modeling because it is part of the NMP, but it will not be used for Phosphorus credit calculations. WQT Plan # 2 will cover 540± acres.

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3. **NUTRIENT MANAGEMENT:** The farm will continue to be managed through an Approved Nutrient Management Plan. The farm will operate to draw down the phosphorus levels in fields testing at or exceeding 50 ppm phosphorus. This will be done by applying less phosphorus than the crop removes. Phosphorus will be drawn down to less than 50 ppm and ultimately to the optimum level on the soil test. The farm only had one field testing in excess of 50 ppm phosphorus on the current soil tests.

4. **NUTREINTS FROM MANURE:** Manure spreading rates and time of year, vary based upon weather conditions and time constraints. Liquid manure is stored in a pit to be spread primarily in the spring and fall, with some summer application. The SnapPlus file used by Northside Elevator to prepare the NMP for 2022 and 2023 was used for manure production estimation. The computed production from 2023 was projection through 2028. SnapPlus contains a manure production estimator used to calculate manure volumes and nutrients in manure produced on a farm.

   Liquid manure was previously surface applied and now will primary be injected with a low disturbance manure applicator. SnapPlus models manure injection as "RUSLE2 operation "Manure injector, liquid high disturbance 30 inch" this causes greater PTP runoff from the farm than does surface application. ***This is not correct for the actual injection method, when or if SnapPlus incorporates low disturbance manure injection methods there will be additional PTP credits produced and claimed.***

   - Liquid Manure Sources: The farm, on average, milks 115 cows and has 30 dry cows. For purposes of calculation, all cows will weigh 1400 pounds and 100% of manure will be collected. The dilution factor of manure used in the SnapPlus manure production estimator is1.8, so even if the farm has a lower or higher dilution rate, the applied nutrients will be comparable.

     - 1400 lb. Dairy Cow produces 17.7± gal. of manure per day x 1.8 = 32 gal.
     - 1400 lb. Dry Cow produces 13.6± gal. of manure per day x 1.8 = 25 gal.
     - [(365 days x 32 gal x 115) + (365 days x 25 gal. x 30)]. = 1,616,950 gal. liquid manure

       Verification Check: According to the interview with Malms they use a custom manure application company for liquid manure, they applied approximately 600,000 gal. in the spring of 2023 and 800,000 gal. in the fall of 2023 = 1,400,000 gal.

       Calculated production is within 15% of the spread amount.

   - Solid Manure Sources: Manure from dairy heifers and steers is collected as solid manure. The farm, on average houses approximately 25 dairy heifers weighing approximately 750 lbs., approximately 25 dairy heifers weighing approximately 1000 lbs., approximately 20 dairy calves weighing approximately 250 lbs., approximately 20 dairy calves weighing approximately 150 lbs., approximately 20 dairy youngstock weighing approximately 500 lbs., and approximately 50 dairy steers weighing approximately 750 lbs. The percent of manure collected in each animal class is included in the below calculations.

     - 750 lb. Dairy Heifer produces 65 lb. of solid manure per day
     - 1000 lb. Dairy Heifer produces 82 lb. of solid manure per day
     - 750 lb. Steer (beef high forage) produces 62 lb. of solid manure per day
     - 500 lb. Dairy youngstock produces 42 lb. of solid manure per day
     - 150 lb. Dairy calf produces 13 lb. of solid manure per day
     - 250 lb. Dairy calf produces 21 lb. of solid manure per day
       (365 days x 25 x 65 lb. x .5/2000) + (365 days x 25 x 82 lb. x .5/2000) + (365 days x 50 x 62 lb. x .5/2000) + (365 days x 20 x 42 lb. x .5/2000) + (365 days x 10 x 13 lb. x1/2000) + (365 days x 20 x 21 lb. x1/2000)= 796 ton.

5. **ROTATION/CROPPING:** A standard rotation is not followed on this farm. The rotation for the farm is adjusted on a field by field basis, as needed, due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, and other environmental factors. The theoretical rotation consists of corn, corn, soybeans, perennial forage crop up to 5 years. The 2024-2028 projected rotation was laid out by Malms as their plan, but is subject to adjustments on a field by field basis, as needed, due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, success of triticale/rye, and other environmental factors. The rotation length was set as 2024-2028. This is less than a complete rotation, but meets T, soil test P and PI index for the shortened rotation.

   Malms are progressive and continue to try new crops, methods and rotations. In WQT-2019-006 they tried to introduce ryegrass as a primary forage crop along with additional alfalfa fields. These practices did not achieve the desired outcome for them, and were discontinued. Alfalfa was their historic perennial forage crop but they have been transitioning over the last few years to a grass and clover mix, which they plan to continue. SnapPlus does not contain a seeding year crop option for oats as a nurse crop with grass and clover, as such oats with alfalfa grass was modeled. WQT-2019-006 included a cover crop after corn silage this practice will continue although they plan to use triticale as the small grain and harvest it for forage prior to no-till seeding corn for grain, as this is only a plan, we will not model "Winter Triticale (forage) to Corn Silage, 30 inch row", if this practice is successful it would be used in future WQT plans to generate PTP credits. The farm submitted an application to the NRCS for perimeter fencing, for rotational grazing on field D1. SnapPlus notes "that grass hay is not a grazed crop, and therefore does not have the sod disturbance expected with grazing. The SnapPlus grass hay crop assumes three cuttings per year of hay, but there is no disruption of the soil surface when the hay is cut. Therefore, the estimated soil loss from grass hay typically is much less than that from any of the pasture crops." Taking into account the above statement field D1 was modeled in Grass hay and Pasture Rotational Stocking, the field modeled as grass hay had on average 6.6 lb. greater PTP runoff per year. Thus field D1 will be modeled as grass hay, because the fencing application has not been approved and grass hay provides the most conservative result. The farm has trialed interseeding a cover crop cocktail mix of ryegrass, clover, rape, and other minor varieties into corn for grain, this practice was not modeled in SnapPlus, however if this practice is successful in future trials, it would be used in future WQT plans to generate PTP credits. The farm has used limited amounts of phosphorus and potassium containing fertilizers the prior two years; they plan to continue this trend into the foreseeable future. The deficit of applied phosphors and potassium may over time cause yields to drop to a point where they need to be applied to maintain production. As such phosphorus and potassium containing fertilizers were included in the SnapPlus model, although the farm does not plan to make any applications in their five year plan, they may need to. Diammonium Phosphate applications were modeled as surface applied to approximate rotational removal, applications were included on soybeans and perennial forage crops. Potassium Sulfate and Potassium Chloride applications were also added to soybeans and perennial forage crops, although no applications are planned.

6. **CORN PRODUCTION**: The following nutrient application data is the theoretical standard for the Malm farm for corn in the 2024-2028 projected rotation. See Attachment C for specific field application data. The yield goal is 151-170 bu. per. acre grain corn and 20-25 ton silage.

- Commercial starter fertilizer 3 gal. per acre of 10-20-10
- 32% UAN liquid 10-20 gal. per acre (based upon manure application and 2nd year nitrogen credits)
- Manure 7,000-10,000 gal. per acre 12-6-17; based upon UW values @ 6% dry matter. Or 10-20 ton. solid manure 2-3-6, based on UW values
- Gypsum 200 lb. per. acre 0-0-0-17s-22c
- Zinc sulfate 10 lb. per acre 0-0-0-17s-35zn
- Theoretical total application to the crop 100-37-63 to 194-67-173 pounds per acre, not including any N credits
- Theoretical crop removal in grain 140-60-45 pounds per acre (N requirement varies based upon soil and MRTN price ratio)
- Theoretical crop removal in silage 140-80-185 pounds per acre (N requirement varies based upon soil and MRTN price ratio)

7. **SOYBEAN PRODUCTION:** The following nutrient application data is the theoretical standard for soybeans in the 2024-2028 projected rotation. See Attachment C for specific field application data. The yield goal is 45-55 bu. per. acre
    - 100 lb. per acre DAP 18-46-0
    - 250 lb. per acre Gypsum 0-0-0-17s-22c
    - 200 lb. per acre Potassium Sulfate 0-0-50-18s
    - 10 lb per acre of boron product
    - Commercial starter fertilizer 1.5 gal. per acre of 3-18-18
    - Theoretical total application to the crop 18-49-103 pounds per acre, not including any N credits
    - Theoretical crop removal in grain NA-40-70 per acre

8. **PERENNIAL FORAGE/GRASS HAY SEEDING YEAR:** The following nutrient application data is the theoretical standard for grass hay seeding in the 2024-2028 projected rotation. See Attachment C for specific field application data. The yield goal is 2 – 3.5 ton per. acre.
    - 75 lb. per acre DAP 18-46-0
    - 350 lb. per acre Gypsum 0-0-0-17s-22c, split application
    - 200 lb. per acre Potassium sulfate 0-0-50-17s, split application
    - 15 lb. per acre Boron product, split application
    - 75 lb. per acre Urea 46-0-0
    - Theoretical total application to the crop 48-35-100 pounds per acre, not including any N credits
    - Theoretical crop removal NA-38-138 pounds per acre

9. **PERENNIAL FORAGE/GRASS HAY:** The following nutrient application data is the theoretical standard for grass hay in the 2024-2028 projected rotation. See Attachment C for specific field application data. The yield goal is 4.1–5 ton per. acre.
    - 150 lb. per acre DAP 18-46-0
    - 300 lb. per acre Gypsum 0-0-0-17s-22c, split application
    - 250 lb. per acre Potassium sulfate 0-0-50-17s, split application
    - 10 lb. per acre Boron product, split application
    - 150 lb. per acre Urea 46-0-0, split application
    - Theoretical total application to the crop 48-35-100 pounds per acre, not including any N credits
    - Theoretical crop removal NA-68-248 pounds per acre

10. **TILLAGE:** The farm will continue to transition away from tillage. There may still be a tillage need to incorporate manure under specific conditions. Over all the farm will not be required by nutrient management to incorporate manure (tillage) within the SWQMA areas because no-till will be used to maintain greater than 30% ground cover and permanent vegetative buffers will also be installed in those areas. The farm no longer has any tillage equipment they recently sold their vertical tillage implement, and plan to plant all crops no-till. However, to be conservative when preparing the SnapPlus model tillage was included in front of perennial forage crops and at random one other field on the farm each year. This was done in the event a field becomes rutted and needs to be corrected prior to planting a perennial forage crop or in the event rut repair is required on a different field. As stated, the farm has sold its vertical tillage tool but may buy a small disk exclusively for rut repair, the tillage was modeled as vertical tillage because the STIR rating for vertical tillage closely matches that of a tandem light finishing disk.
    - Corn and Soybeans will be no-tilled into existing crop residue.
    - Perennial forage crops will be modeled with a spring vertical tillage pass although they plan to plant them with a no-till drill.
    - Cover crops will be seeded either by broadcasting or a no-till grain drill.
    - Tillage on the farm will be required to correct ruts and repair locations that may contribute to erosion if they are not repaired.

11. **COVER CROP AFTER CORN SILAGE:** A small grain cover crop will be seeded after Corn silage, or a cover crop cocktail mix may be interseeded prior to harvest. A credit will only be generated on the years the cover crop is seeded. When harvest is late or soil conditions are too wet, the cover crop will not be seeded, unless sufficient fall growth will be obtained. NRCS Wisconsin Agronomy Technical Note 7 will be used as the installation and operation manual for cover crops. The following recommendations come from Technical Note 7.
    - Seeding up to October 15 recommended
    - Seeding rate of 0.9 bu. per. acre minimum for incorporated seed
    - Seeding rate of 1.6-2.1 bu. per acre minimum for non-incorporated seed

    If the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop, or an emergency small grain cover crop can be seeded, if the farmer and the City decide to do so. The emergency cover crop will need to be seeded according to Wisconsin Agronomy Technical Note 7.

12. **VEGETATED FILTER STRIP:** Filter strips reduce suspended solids and also reduce dissolved contaminates in runoff. Filter strips were previously established as part of WQT-2019-006 and were located in fields with risk of runoff that have a direct connection to Nelson Creek and Rock Creek. A riparian filter strip was installed along Nelson Creek. Other filter strips were installed along waterways that transition into intermittent streams, which carry Phosphorus directly into Rock Creek. Filter strips offer more than a method to trap Phosphorus and other nutrients. They also serve as a removal method; phosphorus trapped in the filter strip will be used by the grass cover and then subsequently removed when the grass is harvested as hay. SnapPlus models flow through a 30’ grass filter strip to calculate the reduction of phosphorous leaving the field when the edge of field filter strip option is selected. Filter strips were modeled for fields AN, AS, BE, D1, C3, G-1, and G-2 as part of WQT-2019-006 and WQT Plan # 2. Water Quality Trading Plan Amendment 1 included a filter strip in

field Gideon, the filter strip will be installed upon approval by the DNR. (see Attachment J for map). See Attachment I for Operation and Maintenance Manual.

Filter/Buffer Strip Installation Procedure:

- **Burn Down.** The filter strip will have an appropriate herbicide such as Glyphosate applied at a rate of 2 Qt. per acre with a surfactant. This will be done to kill all weeds and any existing grasses. Application will be made after the weeds and grasses break dormancy and are actively growing, unless the filter strip is part of an existing grass hay field with a sufficient stem count of cool season grasses.

- **Soil preparation.** A filter strip will not function if a concentrated flow channels pass through the strip, these areas will be graded to create sheet flow. The soil in graded areas will be disked/cultivated to prepare a smooth seedbed.

- **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

30%	Perennial Ryegrass
20%	Fawn Tall Forage Fescue
20%	Timothy
30%	Reed Canary Grass

- **Nurse Crop.** 1 ½ bushel per acre of oats or equivalent nurse crop will be seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment. Oats are a cool season annual grass that will provide ground cover. Nurse crop will be taken off as oatlage or harvested as grain at maturity.

- **Seed Placement.** Seed will be sown using either a grain drill or by a Brillion type seeder. Upon final seed placement a single pass may be made with a large smooth drum roller.

- **Harvest.** For the purpose of filtering, the filter strips will be harvested as appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

13. **POTENTIALLY TRADEABLE PHOSPHORUS:** As previously stated, this farm is well managed and has already taken steps to reduce runoff. They are proactive in trying/implementing new practices on the farm; not all practices are successful. Which is why the Phosphorous credits that we claim will be generated through **No-till/reduced tillage, grassed filter strips and a cover crop after corn silage when applicable**. The following SnapPlus reports will be included in Attachment E

- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

Table 3- PTP No Till/Reduced Tillage

Farm	Field	Acres	PTP 2024	PTP 2025	PTP 2026	PTP 2027	PTP 2028
Malms Rolling Acres	AN	19.1	9	4	16	33	28
Malms Rolling Acres	AS	16.7	7	3	8	22	14
Malms Rolling Acres	BE	37.8	8	31	108	82	121
Malms Rolling Acres	BW1	41.5	9	22	65	114	78
Malms Rolling Acres	BW2	40.4	11	40	33	77	55
Malms Rolling Acres	C1-C2	51.9	105	82	129	227	92
Malms Rolling Acres	C3-C4	24.6	60	126	63	86	122
Malms Rolling Acres	D1	58.4	87	37	22	14	11
Malms Rolling Acres	David North	15.9	33	22	31	23	39
Malms Rolling Acres	David South	33.0	58	38	54	40	68
Malms Rolling Acres	EF	68.7	119	295	117	194	243
Malms Rolling Acres	G-1	46.2	64	28	16	9	7
Malms Rolling Acres	G-2	7.1	9	4	2	1	1
Malms Rolling Acres	Gideon	37.9	88	165	113	28	15
Malms Rolling Acres	H-1	40.8	3	2	5	3	11
Total PTP no till/reduced tillage		**540**	**670**	**899**	**781**	**953**	**903**
Total baseline PTP from WQT-2019-006 and Amendment 1			**2419**	**2298**	**2042**	**2360**	**2105**
Total PTP credits from no till/reduced tillage			**1749**	**1399**	**1261**	**1407**	**1202**

Table 4 - PTP No Till/Reduced Tillage & Filter Strips

Farm	Field	Acres	PTP 2024	PTP 2025	PTP 2026	PTP 2027	PTP 2028
Malms Rolling Acres	AN	19.1	8	3	4	20	7
Malms Rolling Acres	AS	16.7	7	2	2	16	5
Malms Rolling Acres	BE	37.8	6	8	21	24	25
Malms Rolling Acres	BW1	41.5	9	22	65	114	78
Malms Rolling Acres	BW2	40.4	11	40	33	77	55
Malms Rolling Acres	C1-C2	51.9	26	31	28	46	33
Malms Rolling Acres	C3-C4	24.6	13	23	20	18	25
Malms Rolling Acres	D1	58.4	41	33	20	13	11
Malms Rolling Acres	David North	15.9	33	22	31	23	39
Malms Rolling Acres	David South	33.0	58	38	54	40	68
Malms Rolling Acres	EF	68.7	119	295	117	194	243
Malms Rolling Acres	G-1	46.2	30	25	15	9	4
Malms Rolling Acres	G-2	7.1	4	4	2	1	1
Malms Rolling Acres	Gideon	37.9	34	67	49	25	14
Malms Rolling Acres	H-1	40.8	3	2	5	3	11
Total PTP with no till/reduced tillage & filter strips		**540**	**403**	**616**	**465**	**625**	**618**
Total PTP with no till/reduced tillage			**670**	**899**	**781**	**953**	**903**
Total PTP credits generated from filter strips			**267**	**283**	**316**	**328**	**285**

Table 5 - PTP No Till/Reduced Tillage, Filter Strips, & Cover Crop

Farm	Field	Acres	PTP 2024	PTP 2025	PTP 2026	PTP 2027	PTP 2028
Malms Rolling Acres	AN	19.1	8	3	4	16	7
Malms Rolling Acres	AS	16.7	7	2	2	13	4
Malms Rolling Acres	BE	37.8	6	10	12	22	25
Malms Rolling Acres	BW1	41.5	9	22	65	114	78
Malms Rolling Acres	BW2	40.4	11	40	33	77	55
Malms Rolling Acres	C1-C2	51.9	26	31	31	25	31
Malms Rolling Acres	C3-C4	24.6	14	13	18	20	13
Malms Rolling Acres	D1	58.4	41	33	20	13	11
Malms Rolling Acres	David North	15.9	33	22	31	23	39
Malms Rolling Acres	David South	33.0	58	38	54	40	68
Malms Rolling Acres	EF	68.7	119	135	110	193	160
Malms Rolling Acres	G-1	46.2	30	25	15	9	4
Malms Rolling Acres	G-2	7.1	4	4	2	1	1
Malms Rolling Acres	Gideon	37.9	34	71	38	24	14
Malms Rolling Acres	H-1	40.8	3	2	5	3	11
Total PTP with no till/reduced tillage, filter strips, and cover crop after corn silage		**540**	**405**	**450**	**441**	**595**	**519**
Total PTP with no till/reduced tillage and filter strips			**403**	**616**	**465**	**625**	**618**
PTP credits generated from adding a cover crop after corn silage			**-2**	**166**	**24**	**30**	**99**
30 % of PTP credits generated from adding a cover crop after corn silage (see note below)			**-1**	**50**	**7**	**9**	**30**
Total PTP with no till/reduced tillage, filter strips, and 30% of PTP credit generated by the cover crop after corn silage			**404**	**566**	**458**	**616**	**588**

Note: Malm farm seeded cereal rye after corn silage on 40% of their silage corn in 2016 and 100% in 2017. They will seed 100% of the corn silage acres to cover crops for the plan which is an increase of 30% from 2016-2017 historic baseline years. Calculation for the credit for (40%+100%)/2-100=30% increase. Meaning 30% of the credit generated by adding the cover crop will be taken because 70% was the average from baseline calculations.

G. PHOSPHORUS TRADE RATIOS: The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratios. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices.

1. **<u>Trade Ratio Factors</u>:**
   - **Delivery -** N/A
   - **Downstream –** 1.1:1 The Malm Farm is located in the following HUC 12's 070400070403, 070400070402, and 070400070401, which discharge into the Black River through Rock Creek. Rock Creek enters the Black River approximately 250' south of the WWTF outfall. See Attachment F of WQT-2019-006
   - **Equivalency -** N/A for Phosphorus

- **Uncertainty -** Whole Field Management 1:1 per. Appendix H, of Guidance for Implementing Water Quality Trading in WPDES Permits, 6/1/2020 Edition 2 see below eligibly checklist
    - ✓ Approved nutrient management plan
    - ✓ Filter strips/buffer along riparian and high risk
    - ✓ Grassed waterways
    - ✓ Conservation/no-till
    - ✓ Additional practices as deemed by County Conservationist, required site visit
    - ✓ No application of manure on snow covered or frozen ground
    - ✓ All fields under nutrient management plan
    - ✓ Drawdown strategy of nutrients: only one field tests over 50 ppm P, field David North seed into alfalfa to reduce P levels through under fertilizing
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Malm Farm and the City of Greenwood WWTF**.

H. SCHEDULE OF PROPOSED CONDITIONS GENERATING CREDITS:

- No-till/tillage reduction spring 2024
- Cover crop seeded fall of 2023 will provide cover in the spring of 2024
- Cover crop seeded fall of 2024 will provide cover in the following spring
- Filter strips are existing in fields AN, AS, BE, D1, C3, G-1, and G-2, and will continue to generate credits in 2024
- Establishment of filter strip in field Gideon will be installed in 2024 upon approval of the WQT plan by the DNR and acceptance by the City. Credit generation will begin in 2025 for the filter strips.

I. REPORTING:

(REFER TO ATTACHMENT I – OPERATION AND MAINTENANCE PLAN)

J. CORRECTIVE MEASURES: The farmland will be inspected spring and fall to verify that that the practices generating credits are installed and functioning and no corrective measures are required. Waterways will be inspected on a quarterly basis for active evidence of gully erosion; a first quarter inspection will be waived if the waterways are snow covered. The County Conservationist has been involved in the annual inspection of filter strips throughout WQT-2019-006 and will be requested to continue.

K. **PHOSPHORUS CREDIT GENERATION:** Credits are calculated as the difference between phosphorus lost under baseline practices and phosphorus lost under the proposed practices. The Baseline for Malm farm was established in WQT-2019-006 and Water Quality Trading Plan – Amendment 1. The last five years will be used "2019-2023", and brought forward to "2024-2028"; i.e. 2019 will now be known as 2024 and so on. The table below shows the tradeable phosphors per year beginning in 2024 and extending to 2028. However, the City of Greenwood and Malms had entered into a trade agreement through two permit terms, the second permit term was set at 970 pound of phosphorus credits not including field Gideon (see page 14 of section C-1 of WQT-2019-006). Water Quality Trading Plan- Amendment 1 will set phosphorus credit generation at 158 lb. for field Gideon (page 11 of Amendment 1) for this permit term. **The total tradable phosphorus credits claimed by WQT plan #2 will be 970 lb. + 158 lb. =1128 lb. per year. Except for 2024, the filter strips will be installed in field Gideon upon approval by the DNR, the credit deduction in 2024 will be the difference between (PTP under no till 88 lb. and PTP under no till and filter strips 34 lb.) /1.2= 45 lb. (1128 lb-45 lb = 1083 lb.) phosphors credits available in 2024.** The following table 6 summarizes the phosphorus discharge from the farm under the projected rotation. ***Future WQT plan terms may use practices to generate credits that are in the trial phase at this time.***

Table 6 - Tradeable Phosphorus

	PTP 2024	PTP 2025	PTP 2026	PTP 2027	PTP 2028
Total baseline PTP from and WQT-2019-006 and Amendment 1	**2419**	**2298**	**2042**	**2360**	**2105**
Total PTP with no till/reduced tillage, filter strips, and 30% of PTP credit generated by the cover crop after corn silage	**404**	**566**	**458**	**616**	**588**
Tradeable Phosphorus with the 1.2:1 trade ratio applied	**1679**	**1443**	**1320**	**1453**	**1264**

L. MANAGEMENT PRACTICE REGISTRATION: Submit the following to the DNR to register that the management practices have been installed:

- Date of contract. *The original water quality trading agreement between Malms and the City of Greenwood was signed on 7-1-2019 and extends through the following WPDES permit term of 7-01-2024 to 6-30-2029*
- Management Practice Registration form. *See attachment F of section C-1 WQT-2019-006, and attachment G of Amendment 1.*
- Date corrective measures have been completed *(none)*
- Date of seeding filter strips *(2019 for WQT 2019-006) (2024 for field Gideon)*
- Date of 90% ground cover and photo verification (*see previously submitted inspection)*
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season. *(none reported)*
- cover crop seeding *(see previously submitted inspections)*
- Photo of cover crop growth both fall and spring *(see previously submitted inspections)*
- Verification that no till and reduced till were performed where each is applicable *(see previously submitted inspections)*

M. <u>Monthly Reporting</u>: Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**

N. <u>Annual Reporting</u>: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:

- Verification that site inspection has occurred
- Brief summary of site inspection findings
- Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
- At least 1 photo of the filter strips vegetative cover, indicating condition
- At least 1 photo of each field generating credits to verify the crop grown.
- At least 1 photo of each grassed waterway
- Update SnapPlus with crops grown, nutrient applications and tillage. Provide updated copy to DNR
- Provide a summary of nutrient applications such as a SnapPlus "produces plan report"
- A summary of credits used each month over the calendar year
- Photo of cover crop growth both spring and fall
- Verification that no till and reduced till were performed where each is applicable

O. <u>Notification of Problems That Affect Credit Generation</u>: The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT plan. The City will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

- In the event that a cover crop is unable to be seeded after corn silage, the credit will not be claimed
- In the event that the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop
- In the event that a tillage is used outside of being a corrective action that is not consistent with the plan, the credit for no till/tillage reduction for that field will not be taken
- In the event that a gully is found on a field or a failure of a grassed waterway is identified, this may result in either reduced credits (due to greater uncertainty) or fields not being able to generate credits.

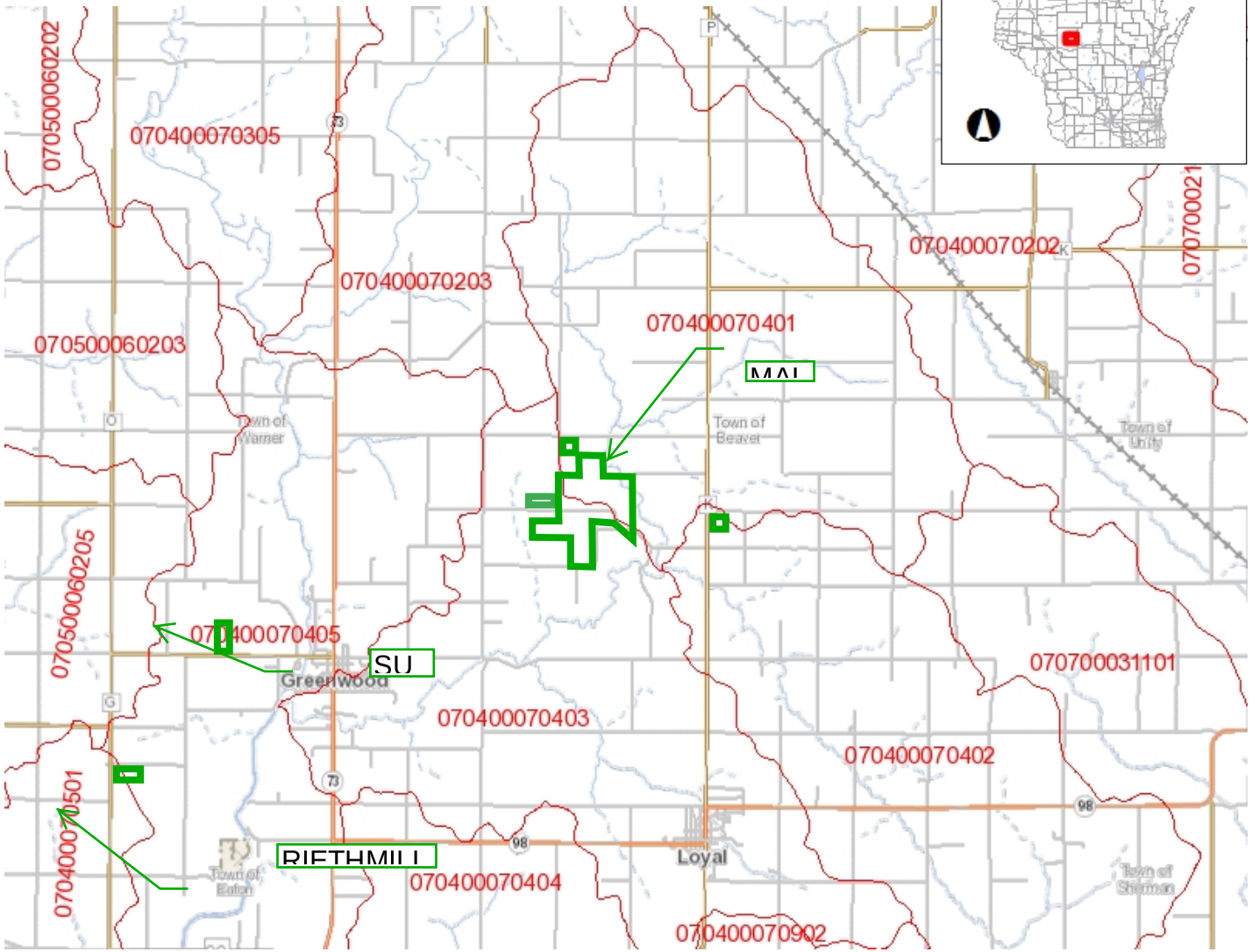
P. <u>DNR RIGHT OF ENTRY</u>: The Malm farm grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

Q. <u>COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST</u>

This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 5, page 45 of Guidance for Implementing Water Quality Trading Plans, Guidance No: 3800-2020-01; Form 3400-208 is included as Attachment K. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit". Below are listed the checklist questions, **<u>bold and underlined</u>**, with the answers following.

• **Permittee's/credit user's WPDES permit number**:	No. WI 020249-10-0
• **Permittee's/credit users contact information:**	Kayla Schar, City Clerk 201 S. Main Street Greenwood WI 54437 Phone 715-267-6205
• **Pollutant for which credit will be generated:**	Phosphorus
• **Amount of Credits available from each location, management practice, local government unit when acting as broker:**	See Section K, page 19
• **Certification that the content of the trading application is accurate and correct**.	See Attachment L
• **Signature and date of signature of permittee's/ credit users authorized representative:**	See Attachment L
• **Location where credits will be generated:**	See Attachment A and B
• **Identification of methods including management practices that will be used to generate credits:**	See Section F, page 10
• **Duration of agreement with each credit generator:**	5 years with the provision of extension, unless WPDES removes the phosphorous requirement
• **Schedule for installation/construction of each management practice:**	See Section L, page 15
• **Operation and Maintenance plan for each management practice**,	See Attachment I and See Attachment D
• **Date when credits become available for each management practice:**	See Section H, page 18
• **Models used to derive the amount of credits:**	SnapPlus, see Attachment C, WQT 2019-006 and Amendment 1 previously submitted for baseline.
• **The applicable trade ratio for each management practice including supporting technical basis:**	See section G, page 17

Greenwood and Adjacent HUC 12's



Legend

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

4.0 0 2.00 4.0 Miles

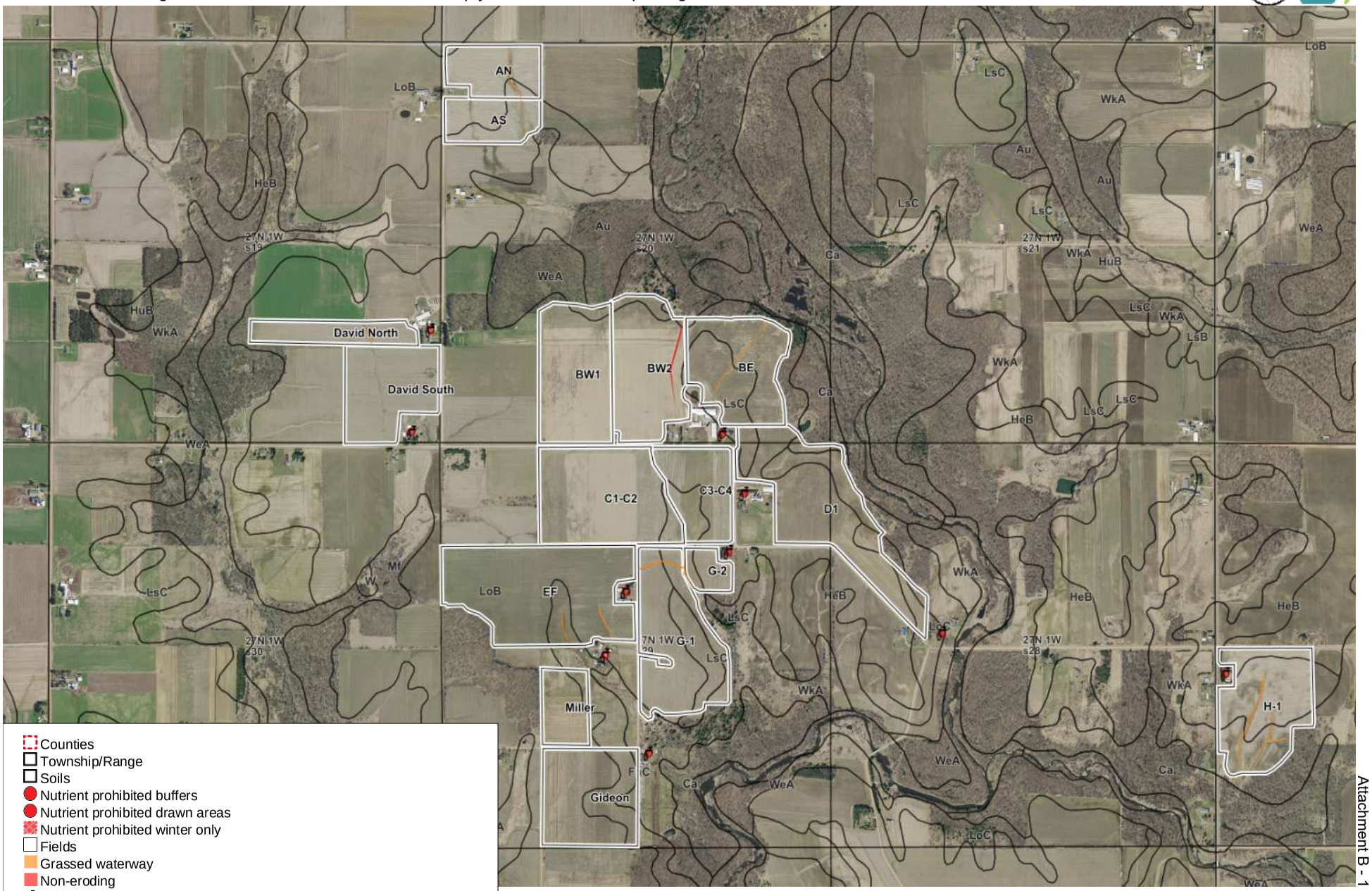
NAD_1983_HARN_Wisconsin_TM

1: 126,720

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

Notes

Farm: Malms Rolling Acres, V20 Generated:2/15/2024, Crop year: 2024, Township Range Section:27N 1W s28



- Counties
- Township/Range
- Soils
- Nutrient prohibited buffers
- Nutrient prohibited drawn areas
- Nutrient prohibited winter only
- Fields
- Grassed waterway
- Non-eroding
- Drinking well

ARM-LWR-480.docx (REV. 06/22/17)

Wisconsin Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Resource Management
Bureau of Land and Water Resources
PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605

Use this form to check nutrient management (NM) plans for compliance with the WI NRCS 2015-590 Standard.

Nutrient Management Checklist

Wis. Stat. §92.05(3) (k), Wis. Admin. Code §ATCP50.04(3) and Ch. 51

COUNTY Clark | DATE PLAN SUBMITTED 2/9/2023 | GROWING SEASON YEAR PLAN IS WRITTEN FOR **2023** (from harvest to harvest)

TOWNSHIP: (T. 27 N.) RANGE: (R. 1 W). Beaver | CHECK ONE: Initial Plan or Updated Plan

NAME OF FARM OPERATOR RECEIVING NM PLAN	FARM NAME (OPTIONAL)	BUSINESS PHONE	
Malm Rolling Acres			
STREET ADDRESS	CITY	STATE	ZIP
W4222 153 Rd	Loyal	WI	54446
REASON THE PLAN WAS DEVELOPED:		CROPLAND ACRES (OWNED & RENTED)	
Ordinance		555	

RENTED FARM(S) LANDOWNER NAME(S) AND ACREAGE: add sheet(s) if needed
David Hursh 49 acres

WAS THE PLAN WRITTEN IN SNAPPLUS? **YES** | If yes, which software version, if known? **20.4**

CHECK PLANNER'S QUALIFICATION:
(1. NAICC-CPCC, 2. ASA-CCA, 3. SSSA-Soil Scientist, 4. DATCP approved training course, 5. Other approved by DATCP)

NAME OF QUALIFIED NUTRIENT MANAGEMENT PLANNER		BUSINESS PHONE	
Northside Elevator, Inc.		**715-255-8507**	
STREET ADDRESS	CITY	STATE	ZIP
227 E. Spring St.	**Loyal**	**WI**	**54446**

Use header sections to add comments. Mark NA in the shaded sections if no manure is applied.

1. Does the plan include the following nutrient application requirements to protect surface and groundwater?

This section applies to fields and pastures. If no manure is applied, check NA for 1.c., 1.h., 1.i., 1.n., 1.o., 1.q., 1.s.	Yes	No	NA
a. Determine field nutrient levels from soil samples analyzed by a DATCP **certified laboratory**.	X		
b. For fields or pastures with mechanical nutrient applications, determine field nutrient levels from **soil samples** collected within the last **4 years** according to 590 Standard (590) and UWEX Pub. A2809, *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin* (A2809) typically collecting **1 sample per 5 acres** of 10 cores. Soil tests are not required on **pastures** that do not receive mechanical applications of nutrients if either of the following applies: 1. The pasture average stocking rate is one animal unit per acre or less at all times during the grazing season. 2. The pasture is winter grazed or stocked at an average stocking rate of more than one animal unit per acre during the grazing season, and a nutrient management plan for the pasture complies with 590 using an assumed soil test phosphorus level of 150 PPM and organic matter content of 6%.	X		
c. For **livestock siting permit approval**, collect and analyze soil samples meeting the requirements above in 1. b., excluding pastures, within 12 months of approval and revise the nutrient management plan accordingly. Until then, either option below maybe used: 1. Assume soil test phosphorus levels are greater than 100 ppm soil test P, OR 2. Use preliminary estimates analyzed by a certified DATCP laboratory with soil samples representing > 5 ac/sample.	X		
d. **Identify all fields'** name, boundary, acres, and location.	X		
e. Use the field's previous year's legume credit and/or applications, predominant soil series, and realistic yield goals to determine the crop's nutrient **application rates consistent with A2809 for ALL forms of N, P, and K.**	X		
f. Make no **winter applications of N and P** fertilizer, except on grass pastures and winter grains.	X		
g. Document method used to determine **application rates**. Nutrients shall not runoff during or immediately after application.	X		
h. Identify in the plan that **adequate acreage** is available for manure produced and/or applied.	X		
i. Apply a single phosphorus (P) assessment using either the **P Index** or **soil test P** management strategy to all fields within a tract when fields receive manure or organic by-products during the crop rotation.	X		
j. Use **complete crop rotations** and the field's **critical soil** series to determine that sheet and rill erosion estimates will not exceed **tolerable soil loss** (T) rates on fields that receive nutrients.	X		
k. Use contours; reduce tillage; adjust the crop rotation; or implement other practices to **prevent ephemeral erosion**; and maintain perennial vegetative cover to **prevent reoccurring gullies** in areas of concentrated flow.	X		
l. Make no nutrient applications within 8' of **irrigation** wells or where **vegetation is not removed**.	X		
m. Make no nutrient applications within **50' of all direct conduits to groundwater**, unless directly deposited by gleaning/pasturing animals or applied as starter fertilizer to corn.	X		

	Yes	No	NA
n. Make no **untreated manure applications** to areas within 1000' of a **community potable water well** or within 100' of a **non-community potable water well** (ex. church, school, restaurant) unless manure is treated to substantially eliminate pathogens.			X
o. Make no manure applications to areas **locally delineated** by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours of application.			X
p. Make no applications of **late summer or fall commercial N fertilizer** to the following areas UNLESS needed for establishment of fall seeded crops OR to meet A2809 with a blended commercial fertilizer. Commercial fertilizer N applications shall not exceed 36 lbs. N/acre on: • Sites vulnerable to N leaching **PRW Soils** (P=high permeability, R= bedrock < 20 inches, or W= wet < 12 inches to apparent water table); • Soils with depths of 5 feet or less to bedrock; • Area within 1,000 feet of a community potable water well. On **P soils, when commercial N is applied** for full season crops in **spring and summer**, follow A2809 and apply one of the following: 1. A split or delayed N application to apply a majority of crop N requirement after crop establishment. 2. Use a nitrification inhibitor with ammonium forms of N. 3. Use slow and controlled release fertilizers for a majority of the crop N requirement applied near the time of planting.	X		
q. Limit manure applications in late summer or fall using the lesser of A2809 or the following 590 rates on **PRW Soils.** Use ≤ 120 lbs. available N/acre on: **P and R soils** on *all crops, except annual crops*. Additionally, manure with ≤ 4% dry matter (DM) wait until after soil temp. < 50°F or Oct. 1, and use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combo. W soils** on *all crops.* Additionally, manure with ≤ 4% DM on *all crops* use at least one of the following: **1.** Use a nitrification inhibitor; **2.** Apply on an established cover crop, an overwintering annual, or perennial crop; **3.** Establish a cover crop within 14 days of application; **4.** Surface apply & don't incorporate for at least 3 days; **5.** Wait until after soil temp. < 50°F or Oct. 1. Use ≤ 90 lbs. available N/acre on: **P and R soils** on *annual crops* wait until after soil temp. < 50°F or Oct. 1. Additionally, manure with ≤ 4% DM use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combination W soils** receiving manure with ≤ 4% DM on *all crops*.	X		
r. Use at least one of the following practices on **non-frozen soils for all nutrient applications** within **Surface Water Quality Management Area (SWQMA)** = 1000' of lakes/ponds or 300' of rivers: **1.** Maintain > 30% cover after nutrient application; **2.** Effective incorporation within 72 hours of application; **3.** Establish crops prior to, at, or promptly following application; **4.** Install/maintain vegetative buffers or filter strips; **5.** Have at least 3 consecutive years no-till for applications to fields with < 30% residue (silage) and apply nutrients within 7 days of planting.	X		
s. Limit mechanical applications to **12,000 gals/acre of unincorporated liquid manure or organic by-products with 11% or less dry matter where subsurface drainage is present** OR **within SWQMA**. Wait a minimum of 7 days between sequential applications AND use one or more of the practice options on non-frozen soils listed in 1.r.1. through **1.r.5.**	X		

2. When frozen or snow-covered soils prevent effective incorporation, does the plan follow these requirements for winter applications of all mechanically applied manure or organic by-products? *This section doesn't apply to winter gleaning/pasturing meeting 590 N and P requirements.*

If no manure is applied, check NA for 2.a. through 2.g..	Yes	No	NA
a. Identify **manure quantities planned to be spread during the winter**, or the amount of manure generated in 14 days, whichever is greater. *For daily haul systems, assume 1/3 of the manure produced annually will need to be winter applied.*	X		
b. Identify **manure storage capacity** for each type applied and stacking capacity for manure ≥ 16% DM if permanent storage does not exist.	X		
c. Show on map and make no applications within the **SWQMA**.	X		
d. Show on map and make no surface applications of liquid manure during **February and March** where **Silurian dolomite** is within 60 inches of the soils surface OR where **DNR Well Compensation** funds provided replacement water supplies for wells contaminated with livestock manure.			X
e. Show on map and make no applications of manure within **300 feet** of **direct conduits to groundwater**.	X		
f. Do not exceed the P removal of the following growing season's crop when applying manure. Liquid manure applications are limited to **7,000 g/acre**. All winter manure applications are not to exceed **60 lbs. of P2O5/acre.**	X		
g. Make no applications of manure to fields with **concentrated flow channels** unless using two of the following: **1.** Contour buffer strips or contour strip cropping; **2.** Leave all crop residue and no fall tillage; **3.** Apply manure in intermittent strips on no more than 50% of field; **4.** Apply manure on no more than 25% of the field waiting a minimum of 14 days between applications; **5.** Reduce manure app. rate to 3,500 gal. or 30 lbs. P2O5, whichever is less; **6.** No manure application within 200 feet of all concentrated flow channels; **7.** Fall tillage is on the contour and slopes are lower than 6%. Make no applications to **slopes greater than 6%** (soil map units with C, D, E, and F slopes) unless the plan documents that no other accessible fields are available for winter spreading AND two of the options 2.g.**1.** through 2.g.**5.** are used.	X		

I certify that the plan represented by the answers on this checklist complies with Wisconsin's NRCS 2015-590 NM Standard or is otherwise noted.

	2/9/2023
Qualified NM planner signature NAICC-*Certified Professional Crop Consultant*, ASA-*Certified Crop Adviser*, or SSSA-*Soil Scientist*	Date
Qualified NM farmer-planner or Authorized farm operator signature receiving and understanding the plan — Date	Signature if reviewed for quality assurance — Date

United States Department of Agriculture

Wisconsin Agronomy Technical Note 7

Cover and Green Manure Crops Benefits to Soil Quality

Measuring the Benefits of the Cover Crop Practice

One of the goals of conservation planning is to consider the effects of conservation practices and systems on soil quality. A number of assessments tools exist to measure the impact of the Cover Crop practice.

Assessing Cover Crop Value as it relates to Soil Quality Benefits

1. The Revised Universal Soil Loss Equation (RUSLE2) and Wind Erosion Prediction System (WEPS) planning software is used to evaluate the impact of cover crop management decisions have on soil loss levels. In addition, RUSLE2 has the Soil Condition Index (SCI) that determines a relative value for anticipated Organic Matter based on management of the cover crop.
2. A soil health assessment is used to determine existing soil characteristics. Typical soil health assessments include soil organic matter levels, soil respiration rates, soil bulk density, soil penetrometer readings, soil infiltration rates and observation of soil cohesion utilizing the slake test.
3. Observable reduction in soil erosion (sheet, rill, ephemeral, and gully). Cover crops increase vegetative and residue cover during periods when erosion energy is high. The addition of cover crops to low residue cropping systems such as corn silage and vegetables can substantially decrease soil erosion.
4. Observable soil porosity improvements due to an increase of biomass, that when decomposed, increases soil organic matter content promoting increased microbial activity and aggregation of soil particles. As a result, soil porosity is increased and bulk density is decreased. **Caution**: avoid planting cover crops when soils are saturated to avoid compaction, or use alternative establishment methods such as aerial over seeding.
5. Observable soil aggregate stability which results in less soil crusting. Cover crops reduce soil crusting by protecting the soil surface from the direct impact of rain drops. The resulting increase of soil organic matter, improved infiltration, and increased aggregate stability will further reduce soil crusting and improve the uniformity of seed germination.
6. Adequate soil surface cover and the improved aggregate stability will reduce erosion and surface water run-off and increase water infiltration rates. Channels created by cover crop roots and earthworms form macropores that further improve infiltration. Cover crops, especially small grains, can effectively capture and utilize excess nitrogen to prevent infiltration below the crop root zone.
7. Cover crops reduce the volume of surface runoff resulting in reduced nutrient losses. Decomposition of cover crop or green manure biomass provides a slow release of nutrients to the root zone. Legume crops fix atmospheric nitrogen and provide nitrogen for the main crop. Legumes also capture more phosphorus than grass or small grains. Small grains are useful as catch crops to utilize end of season nitrogen, which reduces the potential for nitrogen leaching. Planting cover crops on continuous corn silage fields with a history of repeated manure applications during late summer is highly beneficial.
8. Nutrient Immobilization can be observed when decomposition releases available nitrogen to the next crop.

   The carbon-to-nitrogen (C:N) ratio is a relative estimate of the nitrogen necessary to decompose an organic matter (crop residue) source. A C:N ratio of 50:1 or higher will temporarily "immobilize" soil nitrogen. The immobilization is a result of microbes consuming readily available soil nitrogen during the decomposition of crop residue. The nitrogen will remain immobilized until the microbes deplete the crop residue or other organic matter sources.

   Young cereal rye plants have a 14:1 C:N ratio as compared to corn stalks with a 60:1 C:N ratio. The C:N ratio for most clover plants is generally 15:1, which allows nitrogen to quickly become available to the following crop.
9. Cover crops can reduce pesticide loss by reducing surface water runoff resulting in reduced pesticide losses. Increased organic matter increases soil biological activity that can increase the breakdown of pesticide residues.

10. Visible reduction in weed pressure is due to reduced light, seed/soil contact and soil temperatures. The release of chemical compounds by the cover crop (allelopathy) may also inhibit weed growth.

    The potential for a negative impact on the primary crop can be reduced by killing the cover crop two to three weeks prior to planting and ensuring good seed/soil contact during seed placement.

11. Soil moisture can be improved when cover crops and green manure crops remove excess moisture from wet soils, resulting in reduction of "waterlogging" in poorly drained soils.

Specie Selection and Seed Quality

- Select species that are adapted to soil, climatic, and ecological site conditions.
- Select species suited for the planned purpose and specific site conditions.
- Do not plant species identified as restricted or prohibited by law.
- Inoculate legumes with the proper Rhizobium bacteria.
- Non-commercial seed can be used, as long as the seed has been tested for germination.
- Seeding rates are based on certified obtained from commercial sources.

Seedbed Preparation and Seeding

Site preparation shall be adequate to assure weed suppression and to promote germination and growth of the species planted. Seedbed preparation and seeding methods are determined as a result of the following:

- Resource concern and/or objective for planting the cover crop
- Cover crop life cycle (overwintering)
- Current soil surface conditions, moisture levels, existing biomass (surface cover)
- Planned harvest date of the primary crop
- Estimated growing degrees units remaining prior to the average killing frost
- Availability of labor/time and equipment

Seeding Methods

Wisconsin NRCS Conservation Practice Standard 340 - Cover Crop, supports several seeding and planting options to establish cover crops. Successful cover crop plantings require seeding within the recommended dates, seeding methods that ensure adequate seed to soil contact and sufficient soil moisture to support seedling growth.

Cover crops may be drilled, no-tilled, slurry applied, broadcast inter-seeded, over-seeded or frost seeded with or without incorporation depending on field conditions. Incorporation of seed following planting by light shallow tillage, or use of a ring roller, culti-packer or similar tool to embed the seed will result in a more uniform seedling emergence. The following non-traditional establishment methods can be used to expand the settings where cover crops can be utilized.

Slurry Seeded Cover Crops - Slurry-enriched seeding is a process that combines low-disturbance tillage, manure application and the seeding of cover crops into one operation. This technique is efficient and effective in un-tilled crop fields. Cover crop seed is mixed directly with liquid manure in the manure tanker. Cover crop species best suited to plant with this system include; cereal rye, wheat, annual ryegrass, oil seed radish, red, ladino and crimson clover.

For additional details on slurry seeding refer to the following link: http://www.mccc.msu.edu/SlurrySeeding.html.

Frost Seeding is categorized as broadcast or aerial seeding occurring mid to late March through early April during the active freezing and thawing cycle. Warm daytime temperatures combined with low overnight temperatures cause the surface of the soil to freeze and crack. Frost seeding takes skill in determining the exact conditions that are favorable and in assuring the crop will not freeze after emergence.

Guidelines when frost seeding cover crops:

1. Seedbed conditions must favor good seed to soil contact: a) un-tilled winter wheat or soybean residue fields are ideal seedbed conditions, b) frost seeding SHALL NOT occur on un-disturbed heavy residue corn fields or similar conditions, c) when seedbed preparation is necessary to prepare a uniform seedbed in the fall prior to freeze-up and maintain 30-70% residue surface cover.
2. Frost seeding SHALL NOT occur on areas covered with solid ice or snow cover depth greater than 2 inches.
3. Frost seeding shall be completed before the end of the freeze and thaw cycle. Note: Ideal frost seeding conditions vary from year to year, and in certain years the window for seeding may amount to a few days.

CAUTION: Because the risk for failure is high, this practice requires a variance from the Area Resource Conservationist or State Agronomist except for the red clover inter-seeded into dormant winter wheat.

Refer to UW-Publication— "Frost Seeding Red Clover in Winter Wheat" for additional details: http://ipcm.wisc.edu/downloads/nutrient-managment/

Broadcast inter-seeding or over-seeding without incorporation may be used to establish a cover crop into a fully mature crop scheduled for harvest in the near future. The terms inter-seeding and over-seeding, are used interchangeably defining seeding techniques where the cover crop is seeded over the top of an un-harvested crop without incorporation into the soil.

When broadcasting cover crops, seed germination depends on the presence of adequate moisture at the soil surface or within the crop residue layer. Dry conditions will result in poor germination due to limited seed to soil contact. The following guidelines will reduce the risk of seeding failure, when cover crops are broadcasted.

Guidelines for broadcasting cover crops:

1. Assess site for one or more of the following conditions: a) moist, friable soil surface, b) 30% soil surface residue cover to conserve surface moisture for seed germination and c) high probability of rainfall after seeding.
2. Seeding as early as possible within the recommended seeding dates will improve stand density and vigor.
3. Select species known to have the highest germination rate may favor broadcast methods. Below are specie groupings in numeric order beginning with the highest probabilities of successfully germinating:
    - Group 1: small grains
    - Group 2: annual/perennial rye grass
    - Group 3: small seed brassicas
    - Group 4: small seed legumes

Note: Large legume seed crops are not recommended for aerial seeding.

Additional guidelines when broadcasting cover crops into standing crops:

1. Corn for grain: Do not over-seed cover crops when corn is immature or green. Cover crops should be over-seeded after the corn has begun to dry down, silks are brown and leaves are dried up to the ear and turned down. This timing will minimize the potential for seed to be trapped in leaf whorls and will allow sunlight to reach the ground between the rows.
2. Corn for silage: Cover crops should not be over-seeded into corn that will be harvested as silage, more than 21 days prior to the planned harvest date.
3. Soybeans: Over-seed cover crops into standing un-harvested soybeans when 50% of the leaves are yellow and/or prior to 50% leaf drop.
4. Red clover into winter wheat: Over-seed red clover into dormant winter wheat by frost seeding during the active freeze and thaw cycle (late February to mid-March).
5. Red clover into snap beans: Over-seed red clover during the last cultivation of snap beans.

Fertilization

Cover crops usually follow heavily fertilized crops and do not require fertilization. Fall-planted fibrous rooted grasses or small grains will scavenge leftover nitrogen from the previous crop. Legume cover crops will add nitrogen to the system for the following crop. For these reasons, fertilizer is not required unless the site condition warrants it.

Seed Mixtures for Cover Crops

The seeding mixture used will depend on the objective and identified resource concern. Cover crops can include a diverse mix of grass, non-legume broadleaf and legume plants. The seed mixture should create a balanced stand of above ground biomass and root structure to enhance soil building. Seed mixtures that develop a full canopy will maximize snow retention, soil surface coverage, reduce soil erosion and may be utilized for livestock forage. A mixture of grasses, non-legume broadleaf (brassicas, buckwheat, etc.) and legume plants will improve the soil's biological activity. A mixture of plant species will feed beneficial organisms, improve soil structure, reduce compaction, improve water infiltration/water holding capacity and increase the amount of available nutrient exchange sites in the soil.

Cover crop mixtures are often recommended when the goal is to address multiple objectives and resource concerns. When considering multiple species mixtures, consider the effects of; species growth characteristics, anticipated growing conditions, nutrient needs, planned seeding rate and the termination method and date. For multiple specie mixtures, refer to Table 4 "Recommended Cover Crop Mixtures for Planting in Wisconsin".

Use the following references to evaluate cover crop species for growth characteristics and conservation benefits: Table 2 "Identification and Comparison of Cover Crop Performance and Benefits by Species".

Table 3 "Morphology, Physiology and Growth Requirements". "Midwest Cover Crop Decision Tool" http://mccc.msu.edu/index.htm.

Single and Multiple Species Seeding Rate Calculation

When designing cover crop seed mixtures, the seeding rate recommendation is based on the seeding method selected. Cover crops that are drilled, no-tilled, or broadcast and incorporated, the minimum recommended seeding rate or higher can be planned. Cover crop seeding methods such as broadcast over-seeding or inter-seeding, slurry seeded, frost seeded and other methods, where seed to soil contact is of concern, a higher recommended seeding rate is required. When designing multiple cover crop seed mixtures, multiply the minimum seeding rate for each selected plant species by the planned percentage of each species. The "planned percentage" represents a general proportion of the seed to be planted per species and is not a direct calculation of seeds per square foot or an estimate of canopy cover or plant dominance of a given species. Refer to Table 1 "Cover Crop Species Recommended for Planting in Wisconsin" for the recommended seeding rate per species, and Table 4 "Recommended Cover Crop Mixtures for Planting in Wisconsin".

A waiver from the State Agronomist or Area Resource Conservationist for NRCS is required when:

1. Less than **one pound** of seed per plant species is required when designing seed mixtures.
2. More than 4 species are included in the seed mixtures.
3. Cover crops are planted later than the recommended ending seeding date.

Calculating Seeding Rates and Mixes:

Minimum Table 1 seeding rate range or higher per species multiplied by the planned percentage of each species will determine the pounds of seed per plant species to be planted per acre.

Round up to the next full pound of seed if the seeding rate calculation results in a decimal of 0.5 or larger.

Example Seeding Mixture Calculation Results

Spring Mix—Cover crop will be drilled into soybean stubble. The landowner selected the seed mixture below:

40% oats…minimum seeding rate 30 lbs./ac. (Table 1)

40% oilseed radish 4 lbs./ac. (Table 1)

20% field pea 65 lbs./ac. (Table 1)

Actual seeding rates:

Oats= 30 lbs X 40% = 12 lbs for the mix per acre

Radish=4 lbs X 40%= 1.6 which rounded up is 2 lbs for the mix per acre

Pea=65 lbs X 20%=13 lbs for the mix per acre

Cover Crop Attributes

The following summary of cover crop attributes provides additional information (advantages and disadvantages) regarding the species listed in Table 1. Refer to Table 2 for performance and roles of cover crops.

Alfalfa (Medicago sativa)

» Advantages: nitrogen fixer, crude protein: 14-22%, forms arbuscular mycorrhizal associations, attracts pollinators, good at scavenging nitrogen from the soil, and break up compaction.

» Disadvantages: produces autotoxcity and will not tolerate wet sites.

Annual Ryegrass (Lolium multiflorum)

» Advantages: quick-growing non-spreading bunchgrass, establishes quickly even in gravelly or wet soils, excellent for trapping nitrogen, dense shallow root system improves water infiltration and enhances tilth, improves early season weed control, attracts few insect pests and generally can help reduce insect pest level, can be over-seeded into corn or soybeans after leaves turn yellow, self-pollinating, and forms arbuscular mycorrhizal associations.

» Disadvantages: can host high densities of Penetrans Root-Lesion Nematode.

Barley, Spring/Winter (Hordeum vulgare)

» Advantages: produces a deep fibrous root system, produces more biomass than any other small grain crop, will scavenge significant amounts of nitrogen, releases allelopathic chemicals that help suppress weeds, drastically reduces root-knot nematode populations, has a higher nutritional value than oats or wheat, works well in cocktail mixtures, prefers mesic soil conditions.

» Disadvantages: fusarium head blight can be a problem when other small grains are planted within one year and disease problems (especially with tan spot) can be problematic, avoid planting barley after winter wheat.

Berseem Clover (Trifolium alexandrinum)

» Advantages: extremely vigorous tall annual white clover, tolerant of wet conditions, crude protein: 27-29%, excellent nitrogen fixer, forms arbuscular mycorrhizal associations, flowers attract bees, excellent weed suppressor.

» Disadvantages: none.

Buckwheat (Fagopyrum esculentum)

» Advantages: provides quick soil cover, excellent weed suppressor, provides nectar for pollinators and other beneficial insects, loosens topsoil, rejuvenates low fertility soils, dense fibrous root cluster in the top 10 inches of soil providing an extensive root surface area for nutrient uptake, extracts soil phosphorus from the soil better than most grain-type cover crops, residue decomposes quickly releasing nutrients to the next crop, excellent choice to follow early vegetables, popular honey bee pollinator.

» Disadvantages: sets seed quickly, will reseed and may become a weed if flowers mature, frost sensitive, will not germinate/thrive in cold soils, and highly attractive to Japanese Beetles.

Canola/Rape (Brassica napus)

» Advantages: flowers attract pollinators, good at scavenging nitrogen from the soil, crude protein: hay 16%, grain 21%, silage 12%, pasture 17%.

» Disadvantages: susceptible to sclerotinia, host for Penetrans Root-Lesion Nematode.

Cereal Rye, Winter (Secale cereale)

» Advantages: tremendous biomass production, can be seeded later in the fall than other cover crops, germinate at temperatures as low as 34°F and produce vegetative growth at 38°F, reduces nitrate leaching, excellent weed suppressor, secrete compounds that will inhibit germination of weeds such as lambquarters, redroot pigweed, dandelions, and Canada thistle, few diseases affect rye as compared to other small grains, can be over-seeded in field crops, can be grown on a wide range of soils and will increase the concentration of exchangeable K near the surface by means of its fibrous root system, tolerates triazines herbicides, excellent for scavenging nitrogen, medium water use.

» Disadvantages: may become a weed when terminated too late, not recommended before corn in rotation, host for Penetrans Root-Lesion Nematode.

Chicory (Cichorium intybus)

» Advantages: rapid growth, excellent forage crop, crude protein: 20-32%, attracts pollinators, rooting depth 4 to 5 feet, forms arbuscular mycorrhizal associations, used in mixtures, grows well under droughty conditions.

» Disadvantages: none.

Cow pea (Vigna unguiculata)

» Advantages: provides 50 to 100 pounds of nitrogen, attracts pollinators, forms arbuscular mycorrhizal associations.

» Disadvantages: none.

Crimson Clover (Trifolium incarnatum)

» Advantages: grows well on poorly drained soils, use as a winter kill annual, utilize as hay, pasture, favored legume of organic farmers, attracts pollinators, grows well in extreme heat.

» Disadvantages: host for root knot nematode and Penetrans Root-Lesion Nematode.

Field Pea (Pisum satuvum)

» Advantages: residue breaks down and releases nitrogen quickly, provide nitrogen at a rate of 50 to 100 pounds per acre, mix well with oats and barley, excellent for soil building and water use is low.

» Disadvantages: can lead to aphanomyces problems when in rotations with alfalfa, susceptible to sclerotinia.

Forage/Oilseed Radish (Raphanus sativa)

» Advantages: deep root crop, excellent for compaction control, crude protein: 26-30%, good for scavenging nitrogen from the soil, flowers attract pollinators and excellent for grazing.

» Disadvantages: winter kills at 25°F, odor during decay, host for root knot nematode, Penetrans Root-Lesion Nematode, and sugarbeet cyst nematode.

Forage Turnips (Brassica rapa)

» Advantages: root crop, crude protein: leaf tops 16%, root 12-14%, forms arbuscular mycorrhizal associations, rated good for scavenging Nitrogen, flowers attract pollinators, excellent for grazing.

» Disadvantages: can become a serious weed if allowed to go to seed, host for root knot nematode, Penetrans Root-Lesion Nematode, and sugarbeet cyst nematode.

Hairy Vetch (Vicia villosa)

» Advantages: provides 60 to 120 pounds of nitrogen, attracts pollinators, used in a cocktail mixtures, only vetch species that can

be fall seeded and reach maturity the next year, can withstand trampling from grazing animals during May and June, adapted to a wide range of soil types, but prefers loamy and sandy soils.

» Disadvantages: stems are weak and have a tendency to lodge, when seeded with a small grain, the weak stems are supported by the tangling of the tendrils with the small grain stalks, do not plant hairy vetch with a winter grain if you desire to harvest grain for feed or sale, fall seeded hairy vetch will winterkill with temperatures less than 15 degrees with no snow cover, certain species of nematodes increase with hairy vetch, Spring/summer seeding is less successful.

Japanese Millet (Echinochloa frumentacea)

» Advantages: fast growing annual grass, tolerates frequent clipping, makes excellent forage and hay, tolerate both droughty and wet soils, excellent feed source, good choice for converting land to vegetable production.

» Disadvantages: will not germinate/thrive in cold soil, host for Penetrans Root-Lesion Nematode.

Oats (Avena sativa)

» Advantages: provide quick weed suppressing biomass, naturally occurring compounds in roots and residue can hinder weed growth, excellent nutrient catch crop, improves productivity of legumes when planted in mixes, inexpensive to establish.

» Disadvantages: slow to release nitrogen to following crops, unless growth is terminated in mid-vegetative stage (12 to 18 inches), host for Penetrans Root- Lesion Nematode.

Pearl Millet (Pennisetum glaucum)

» Advantages: forms arbuscular mycorrihizal associations, excellent for grazing, low water use requirements, self-pollinator.

» Disadvantages: slower to establish than sorghum or sudangrass, will not germinate/ thrive in cold soil.

Red Clover (Trifolium pratense)

» Advantages: provides 70 to 120 pounds of nitrogen, crude protein: 15%, flowers attract bees and can be used in cocktail mixtures.

» Disadvantages: host for root knot nematode and Penetrans Root-Lesion Nematode.

Sunflower (Helianthus annuus)

» Advantages: deep rooted, effective in mining mobile nutrients deep in the soil profile, attracts pollinators, forms arbuscular mycorrhizal associations, can be used cocktail mixtures.

» Disadvantages: may increase sclerotinia inoculum.

Sorghum-Sudangrass Hybrids (Sorghum bicolor x S. bicolor var. Sudanese)

» Advantages: tall fast-growing heat-loving summer annual, suppress some nematodes species, seedling, shoots, leaves and roots secrete allelopathic compounds that suppress weeds, has an aggressive root system that relieves compaction, mowing stalks increases root mass 5 to 8 times compared with un-mowed stalks and forces the roots to penetrate deeper making the root system an excellent subsoil aerator, drought tolerant, will tolerate a pH range of 5 to 9, nutrient uptake increases on sandy soils, self-pollinator, medium water use required, forms arbuscular mycorrhizal associations.

» Disadvantages: requires fertile soils, mature plants terminated by frost-killed become quite woody.

Sudangrass (Sorghum bicolor)

» Advantages: tall fast-growing heat-loving summer annual, suppress some nematodes species, seedling/shoots/leaves and roots secrete allelopathic compounds that suppress weeds, has an aggressive root system that relieves compaction, mowing stalks increases root mass 5-8 times compared with un-mowed stalks and forces the roots to penetrate deeper, making the root system an excellent subsoil aerator, drought tolerant, will tolerate a pH range 5-9, nutrient uptake increases on sandy soils, self-pollinator, medium water use required, forms arbuscular mycorrhizal associations.

» Disadvantages: requires fertile soils, frost damaged plants can cause prussic acid poisoning in livestock, drought stressed plants can cause nitrate poisoning, host for Penetrans Root-Lesion Nematode.

White Clover (Trifolium repens)

» Advantages: crude protein 24-30%, forms arbuscular mycorrhizal associations, flowers attracts bees.

» Disadvantages: will not tolerate droughty soils and has a shallow root system.

Triticale, Winter (Triticum x Secale)

» Advantages: crude protein: hay 9-16%, grain 17%, self-pollinator, forms arbuscular mycorrhizal associations, excellent weed suppressor and excellent for grazing.

» Disadvantages: seed is more expensive than wheat or rye.

Wheat, Winter/Spring (Triticum aestivum)

» Advantages: excellent weed suppressing crop, can be over-seeded into corn or soybeans, produces a tremendous amount of biomass, excellent nitrogen scavenger.

» Disadvantages: host for Penetrans Root-Lesion Nematode, when planted in rotation with other small grains within a year there can be disease problems (especially with tan spot).

Termination of Cover Crops:

Cover crops will be terminated by frost, harvest or grazing for forage, roller crimping, tillage, and/or with proper herbicide selection. Timely termination of in season cover crops is required to reduce soil moisture depletion, nitrogen immobilization, allelopathy and to prevent unwanted re-seeding. Timing of cover crop termination must meet the purpose of the cover crop as specified in the conservation plan. Manage cover crop surface residue and biomass production to meet objectives specified in the conservation plan. In vineyards and small fruit operations, grow cover crop in aisles, mow as necessary for mulch cover and maintain as short stubble. Adjust nitrogen application rates for the subsequent crop based on nitrogen credits for specific cover crop species from University of Wisconsin nutrient guidelines.

(a) Herbicide Termination:

Herbicide selection for termination must be made by a Certified Pesticide Applicator, Certified Crop Advisor or qualified Extension Specialist following pesticide labeling and must be compatible with the following main crop to grown.

(b) Winter Kill Termination:

Insure that planned cover and biomass production levels can be achieved for the specific cover crop purpose from the conservation plan when using cover crop species that terminate by frost or winter kill. When the objective of the conservation plan is to allow fall manure applications to in high Nitrogen Leaching soils, winter kill termination is not an option and winter hardy cover crops must be used.

(c) Grazing/Haying Termination:

Cover crops grazed or harvested for forage as a termination method will have a specified amount of target residual biomass left in the field to meet the cover crop objective(s) outlined in the conservation plan. Employ additional termination methods as needed once grazing/haying has concluded and target biomass is achieved and documented. When cover crops are grazed, potential adverse reactions from cover crop consumption by grazing animals must be monitored at all times.

(d) Tillage Termination:

Use inversion type tillage implements that will adequately bury and kill the cover crop.

(e) Roller/Crimper Termination:

Rolling/crimping will take place at the proper cover crop growth stage to limit regrowth potential. For small grains this stage is at the boot or grain head stage, for legumes the flowering stage. Direction of rolling/crimping will coincide with planting direction when no-till planting the subsequent crop. Crimpers must break the plant stems in three or more places to be effective. Crimping must be done prior to seed set stage in order to prevent tillering or reseeding of the cover crop.

For additional NRCS cover crop termination criteria refer to: "NRCS Cover Crop Termination Guidelines". http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/

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Midwest Cover Crop Decision Tool: http://mcccdev.anr.msu.edu/

Planting Winter Cereal Rye after Corn Silage: http://www.soils.wisc.edu/extension/covercrop.php

NRCS Cover Crop Termination Guidelines: http://www.nrcs.usda.gov/wps/portal/nrcs/main/ national/landuse/crops/

National Agricultural Aviation Association website: http://www.agaviation.org/

UW Extension Publications: Cover Crop Termination, Forage Herbicide Quick Sheet – Cereal Rye Forage after Corn Silage, Forage Herbicides Quick Sheet – Spring-Seeded Forages after Corn and Herbicide Rotation Restrictions in Forage and Cover Cropping Systems located at the Wisconsin Crop Weed Science Website: http://wcws.cals.wisc.edu

Table 1: Cover Crop Species Recommended for Planting in Wisconsin

Species	[1] Minimum Seeding Rate in lbs. bu./ac. (incorporated seed)		[2] Minimum Seeding Rate in lbs. bu./ac. (non-incorporated seed)		Seeding Date (statewide)	Planting Depth (inches)
GRASSES	lbs.	bu.	lbs.	bu.		
Annual Ryegrass (Lolium multiflorum)	15	0.7	20	0.8	4/10-6/1, 8/1-9/1	¼ to ½
Barley, Spring (Hordeum vulgare)	50	1.0	63 to 75	1.3 to 1.6	4/10-6/15, 7/15-9/1	¾ to 1½
*Japanese Millet (Echinochloa frumentacea)	22	0.5	28	0.6	6/1-7/15	½ to ¾
*Sorghum Sudangrass (Sorghum bicolor x S. bicolor var. Sudanese)	28	0.6	33	0.7	6/1-7/15	½ to 1½
*Sudangrass (Sorghum biclor)	28	1.0	33	1.2	6/1-7/15	½ to 1
*Pearl Millet (Pennisetum glaucum)	22	0.5	28	0.6	6/1-7/15	½ to ¾
Wheat, Spring (Triticum aestivum)	50	0.8	70 to 90	1.2 to 1.5	4/10-6/15, 7/15-9/1	¾ to 1½
Barley, Winter (Hordeum vulgare)	50	1.0	63 to 75	1.3 to 1.6	8/15-9/15	¾ to 1½
Cereal Rye, Winter (Secale cereale)	60	0.9	90 to 120	1.6 to 2.1	7/15-10/15	¾ to 1½
Oats (Avena sativa)	30	0.9	45 to 60	1.4 to 1.9	4/10-9/1	½ to 1½
Wheat, Winter (Triticum aestivum)	50	0.8	70 to 90	1.2 to 1.5	8/1-10/1	¾ to 1½
Triticale, Winter (Triticum x Secale)	50	1.0	70 to 90	1.3 to 1.9	8/1-10/1	¾ to 1½
NON-LEGUMES BROADLEAF	lbs.	bu.	lbs.	bu.		
*Buckwheat (Fagopyrum esculentum)	20	0.4	35	0.7	5/15-8/1	½ to 1
**Oilseed Radish (Raphanus sativus)	4	--	12	--	4/10-6/15, 7/15-8/15	½ to ¾
*Sunflower (Helianthus annuus) (part of a mix)	1	--	2	--	6/1-7/15	1 to 1½
*Chicory (Cichorium intybus) (part of a mix)	1	--	2	--	4/10-6/1, 8/1-9/1	½ to ¾
Rapeseed/Canola (Brassica napus)	2	--	6	--	4/10-6/15, 8/1-8/15	½ to ¾
Forage Turnips (Brassica rapa)	1	--	5	--	4/10-6/15, 7/15-8/15	¼ to ½
LEGUMES	lbs.	bu.	lbs.	bu.		
Alfalfa (Medicago sativa)	13	--	16	--	4/15-6/1, 8/1-8/30	¼ to ½
Berseem Clover (Trifolium alexandrinum)	9	--	17	--	6/1-8/1	¼ to ½
*Cowpea (Vigna unguiculata)	55	0.9	99	1.7	6/1-7/15	1 to 1½
*Field Pea (Pisum satuvum)	65	2.6	100	4.0	4/10-6/15	1 to 1½
Hairy Vetch (Vicia villosa)	15	--	20	--	4/10-6/15, 7/15-9/15	1 to 1½
*Peas, Winter (Pisum sativum subsp. arvense)	65	2.6	100	4.0	8/1-9/1	1 to 1½
Red Clover (Trifolium pratense)	9	--	13	--	4/10-8/15	¼ to ½
White Clover (Trifolium repens)	7	--	9	--	4/15-6/1, 8/1-8/30	¼ to ½
Crimson Clover (Trifolium incarnatum)	11	--	17	--	6/1-8/1	¼ to ½

[1] Incorporated seed—Seeding methods used that provide good seed to soil contact (drilled, no-tilled, or broadcast and incorporated).

[2] Non-incorporated seed—Seeding methods used when broadcasting seed without mechanical incorporation (aerial, over-seeding/inter-seeding and frost seeding.
Cover crop seed mixture designs must include a minimum of 1 pound of seed per specie planted.

* Species with asterisk are not recommended for aerial seeding. Large seed legumes (cowpea, etc.) and summer annuals (Japanese millet, etc.) require adequate seed to soil contract.

** Spring seeding of oil seed radish must include the termination strategy to prevent the production of viable seed.

Table 2: Identification and Comparison of Cover Crop Performance and Benefits by Species

Species	Use [1]	N-Source	SoilBuilder	Erosion Fighter	Weed Fighter	Pest Fighter	N-Scavenger	Grazing	Quick Growth	Non-Fragile Residue	Pollinator	Deep Rooted
Alfalfa (Medicago sativa) [3]	C	4	3	3	3	1	2	3	3	1	3	4
Annual Ryegrass (Lolium multiflorum)	C	0	3	3	2	2	3	4	4	2	0	2
Barley, Spring (Hordeum vulgare)	C	0	3	3	3	1	3	3	3	4	0	2
Berseem Clover (Trifolium alexandrinum) [3]	C	4	2	2	2	1	1	4	2	1	3	1
Buckwheat (Fagopyrum esculentum)	C	0	2	3	3	1	3	1	4	0	4	4
Canola/Rapeseed (Brassica napus)	C	0	2	3	2	1	3	4	4	1	3	3
Cereal Rye, Winter (Secale cereale)	C	0	4	4	4	3	4	4	4	4	0	3
Chicory (Cichorium intybus)	E	0	2	2	2	0	2	3	2	1	2	3
Cowpea (Vigna unguiculata)	C	3	2	2	2	0	2	3	3	1	2	1
Crimson Clover (Trifolium incarnatum)	E	3	2	3	2	1	2	4	3	1	4	2
Field Pea (Pisum satuvum)	C	2	2	2	1	1	1	2	3	1	2	2
Forage Turnips (Brassica rapa)	C	0	1	3	2	0	3	4	3	1	1	1
Forage/Oilseed Radish (Raphanus sativus)	E	0	2	3	2	1	4	3	3	1	3	3
Hairy Vetch (Vicia villosa)	C	4	2	2	3	2	1	0	2	1	2	4
Japanese Millet (Echinochloa frumentacea)	C	0	3	3	3	3	3	3	4	4	1	3
Oats (Avena sativa)	C	0	3	3	3	2	3	4	4	2	0	2
Peas, Winter (Pisum sativum subsp. arvense)	C	2	2	2	1	1	1	2	3	1	2	2
Pearl Millet (Pennisetum glaucum)	C	0	3	3	4	2	3	4	4	4	1	2
Red Clover (Trifolium pratense)3	C	4	3	3	3	1	2	4	3	2	4	3
Sorghum-Sundangrass (Sorghum bicolor x S. bicolor var. Sudanese)	C	0	4	4	4	2	4	4	4	4	2	3
Sunangrass (Sorghum biclor)	C	0	4	3	4	3	4	4	4	4	2	3
Sunflower (Helianthus annuus)	E	0	2	2	2	1	3	1	3	3	3	4
Triticale, Winter (Triticum x Secale)	C	0	3	3	3	2	3	4	3	4	0	2
Wheat, Spring/Winter (Triticum aestivum)	C	0	3	3	3	2	3	4	3	4	0	2
White Clover (Trifolium repens) [3]	C	2	2	1	1	2	3	3	3	3	2	0

[1] Use: C=Common Use – Considerable state knowledge regarding species use.
E=Emerging Use – Limited state knowledge regarding species use.

[2] Attribute Ratings: 0=Poor, 1=Fair, 2=Good, 3=Very Good, 4=Excellent

[3] Legumes such as alfalfa and red clover may cause bloating of ruminant animals. Take necessary precautions to prevent bloat when grazing cover crops that contain these legumes.

Table 3: Morphology, Physiology and Growth Requirements

Species	Life Cycle	Growth Height	Preferred pH	Minimum Germination Temp	Heat Toler-ance	Drought Tolerance	Shade Tolerance	Flood Tolerance	Low Fertility Tolerance	Winter Suviv-al	Dry Matter Production (.b/ac/vr)	Termination Information
GRASSES												
Annual Ryegrass (Lolium multiflorum)	winter annual	upright	5.5 - 7.0	40	good	good	very good	very good	good	seldom	1000 - 6000	freeze, tillage, chemical
Barley, Spring (Hordeum vulgare)	cool season annual	upright	6 to 8	38	fair	good	fair	good	very good	never	2000 - 5000	freeze, tillage, mow, chemical, roller crimper
Barley, Winter (Hordeum vulgare)	winter annual	upright	6.0 - 8.0	38	fair	good	fair	good	very good	expected	2000 - 5000	tillage, mow, chemical, roller crimper
Cereal Rye, Winter (Secale cereale)	cool season annual	upright	5.0 - 7.0	34	fair	very good	good	very good	excellent	expected	2500 - 6000	freeze, tillage, mow, chemical, roller crimper
Japanese Millet (Echinochloa frumentacea)	summer annual	upright	4.6 - 7.0	65	excellent	excellent	fair	fair	very good	never	1500 - 3500	freeze, tillage, chemical
Oats (Avena sativa)	cool season annual	upright	4.5 - 6.0	38	fair	good	good	very good	very good	never	2000 - 6000	freeze, mow, tillage, chemical
Pearl Millet (Pennisetum glaucum)	summer annual	upright	5.5 - 7.0	65	excellent	excellent	fair	fair	excellent	never	2000 - 6000	freeze, tillage, chemical
Sorghum-Sundangrass (Sorghum bicolor x S. bicolor var. Sudanese)	summer annual	upright	5.5 - 7.0	65	excellent	excellent	fair	good	good	never	3000 - 8000	freeze, tillage, chemical
Sunangrass (Sorghum biclor)	summer annual	upright	5.5 - 7.0	65	excellent	excellent	fair	good	good	never	3000 - 8000	freeze, tillage, chemical
Triticale, Winter (Triticum x Secale)	winter annual	upright	5.2 - 7.0	38	fair	good	fair	good	good	expected	2000 - 5000	tillage, mow, chemical, roller crimper
Wheat, Spring (Triticum aestivum)	cool season annual	upright	6.0 - 7.0	38	fair	good	fair	good	good	never	2000 - 5000	freeze, tillage, mow, chemical, crimper
Wheat, Winter (Triticum aestivum)	winter annual	upright	6.0 - 7.0	38	fair	good	good	good	good	expected	2000 - 5000	tillage, mow, chemical, roller crimper
NON-LEGUMES BROADLEAF												
Buckwheat (Fagopyrum esculentum)	summer annual	upright to semi-upright	5.0 - 7.0	50	excellent	good	fair	fair	very good	never	1500 - 2500	freeze, tillage, chemical, mow
Chicory (Cichorium intybus) (part of a mix)	short-lived perennial	upright	5.0 - 7.0	50	very good	very good	good	good	very good	expected	1500 - 2000	tillage chemical
Forage Turnips (Brassica rapa)	cool season annual	upright	5.3 - 6.0	45	good	fair	good	fair	good	seldom	1200 - 3000	freeze, tillage, chemical
Oilseed Radish (Raphanus sativus)	cool season annual	upright	6.0 - 7.0	45	good	very good	good	fair	good	seldom	1200 - 3000	freeze, tillage, chemical
Rapeseed/Canola (Brassica napus)	winter/cool season	upright	5.5 - 8.0	41	good	good	good	fair	good	seldom	1000 - 2500	freeze, tillage, chemical
Sunflower (Helianthus annuus) (part of a mix)	summer annual	upright	5.7 - 8.0	44	excellent	excellent	good	fair	very good	never	250 - 500	freeze, tillage, chemical, mow
LEGUMES												
Alfalfa (Medicago sativa)	cool season perennial	upright	6.5 - 7.0	42	good	good	fair	poor	poor	expected	3000 - 8000	tillage chemical
Berseem Clover (Trifolium alexandrinum)	summer annual	upright	5.0 - 7.0	42	very good	good	fair	fair	fair	never	1200 - 3000	freeze, tillage, chemical
Cowpea (Vigna unguiculata)	summer annual	semi-upright to climbing	5.5 - 6.0	58	excellent	very good	fair	very good	very good	never	2000 - 3600	freeze, tillage, chemical, mow
Crimson Clover (Trifolium incarnatum)	winter annual	upright to semi-upright	5.5 - 7.0	42	very good	good	fair	very good	very good	never	3500 - 5500	freeze, tillage, chemical
Field Pea (Pisum satuvum)	cool season annual	climbing	6.0 - 7.0	41	fair	fair	fair	fair	fair	seldom	1200 - 3000	tillage, mow, chemical
Hairy Vetch (Vicia villosa)	winter/cool season annual	climbing	5.5 - 7.0	60	fair	good	good	good	good	expected	1800 - 4000	tillage, chemical, roller crimper
Peas, Winter (Pisum sativum subsp. arvense)	winter annual	climbing	6.0 - 7.0	41	fair	fair	fair	fair	fair	seldom or expected	1200 - 3000	tillage, mow, chemical
Red Clover (Trifolium pratense)	short-lived perennial	upright	5.0 - 8.0	41	very good	good	very good	good	very good	expected	2000 - 5000	tillage chemical
White Clover (Trifolium repens)	cool season annual	upright	5.5 - 6.5	42	fair	fair	fair	good	fair	expected	600 - 1000	tillage chemical

Table 4: Recommended Cover Crop Mixtures for Planting in Wisconsin

Species	Seeding Rate Drill/Broadcast	Seeding Date (statewide)	Planting Depth (inches)
COCKTAIL MIXTURES			
Forage/Oilseed Radish (50%)	4-12 lbs./ac	8/1-9/1	¾ to 1
Peas, Winter (50%)	65-100 lbs./ac		
Cereal Rye, Winter (50%)	60-120 lbs./ac	7/15-9/15	½ to 1½
Hairy Vetch (50%)	15-20 lbs./ac		
Annual Ryegrass (60%)	15-20 lbs./ac	4/10-6/1, 8/1-9/1	¼ to ½
Oilseed Radish (40%)	4-12 lbs./ac		
Berseem Clover (50%)	9-17 lbs./ac	6/1-8/1	½ to ¾
Oats (50%)	30-60 lbs./ac		
Oats (60%)	30-60 lbs./ac	4/10-6/15, 7/15-9/1	½ to ¾
Oilseed Radish (40%)	4-12 lbs./ac		
Oats (60%)	30-60 lbs./ac	6/1-6/15, 7/15-9/1	¼ to ½
Peas, Winter (40%)	65-100 lbs./ac		
Oilseed Radish (40%)	4-12 lbs./ac	8/1-9/1	¾ to 1
Hairy Vetch (60%)	15-20 lbs./ac		
Oats (60%)	30-60 lbs./ac	4/10-6/15, 7/15-9/1	¾ to 1
Oilseed Radish (40%)	4-12 lbs./ac		
Field Pea (20%)	65-100 lbs./ac		
Oats (60%)	30-60 lbs./ac	5/1-6/15, 7/15-9/1	½ to 1
Annual Ryegrass (20%)	15-20 lbs./ac		
Crimson Clover (20%)	11-17 lbs./ac		
Field Pea (20%)	65-100 lbs./ac	5/1-6/15, 7/15-9/1	½ to 1
Oats (30%)	30-60 lbs./ac		
Pearl Millet (20%)	22-28 lbs./ac		
Forage Turnips (15%)	1-5 lbs./ac		
Crimson Clover (15%)	11-17 lbs./ac		
Field Pea (30%)	65-100 lbs./ac	5/1-6/15, 7/15-9/1	½ to 1
Rapeseed/Canola (5%)	1-5 lbs./ac		
Crimson Clover (20%)	11-17 lbs./ac		
Oats (40%)	30-60 lbs./ac		
Sunflower (5%)	1-2 lbs./ac		

FM6: Soil Test Report

Reported For	Malms Rolling Acres
Printed	2024-02-15
Plan Completion/Update Date	2023-02-03
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
AN		19.1	LoB	LOYAL	2020-09-16	Dairyland Labs	8S6053	**4**	**4**	6.9	3.5	10	27	0	12
AN		19.1	LoB	LOYAL	2016-11-03	Dairyland Labs	8S4050	**4**	**4**	6.9	3.6	10	39	0	12
AN		19.1	LoB	LOYAL	2012-09-21	Dairyland Labs	8S3939	**4**	**8**	6.7	4.7	18	168	0	0
AN		19.1	LoB	LOYAL	2008-11-14	Dairyland Labs	8s2488	**4**	**8**	7.1	4.0	22	114	0	13
AS		16.7	WeA	WITHEE	2020-09-16	Dairyland Labs	8S6053	**3**	**4**	6.8	3.5	15	40	0	12
AS		16.7	WeA	WITHEE	2016-11-03	Dairyland Labs	8S4050	**3**	**4**	6.8	3.2	11	41	0	11
AS		16.7	WeA	WITHEE	2012-09-21	Dairyland Labs	8S3939	**3**	**8**	6.7	4.7	18	168	0	0
AS		16.7	WeA	WITHEE	2008-11-14	Dairyland Labs	8s2488	**3**	**8**	7.1	4.0	22	114	0	13
BE		37.8	LoB	LOYAL	2020-09-16	Dairyland Labs	8S6053	**8**	**8**	6.9	3.1	17	37	0	11
BE		37.8	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**8**	**8**	6.8	3.5	26	113	0	11
BE		37.8	LoB	LOYAL	2012-10-24	Dairyland Labs	8S5585	**8**	**9**	6.8	3.6	22	68	0	0
BE		37.8	LoB	LOYAL	2009-04-27	Dairyland Labs	8s5286	**8**	**9**	7.0	3.3	19	64	0	14
BW1		41.5	LoB	LOYAL	2020-09-16	Dairyland Labs	8S6053	**8**	**8**	7.0	3.3	16	33	0	11

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
BW1		41.5	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**8**	**5**	6.9	3.8	20	67	7.5	12
BW1		41.5	LoB	LOYAL	2012-09-21	Dairyland Labs	8S3939	**8**	**8**	6.8	3.8	28	161	0	0
BW1		41.5	LoB	LOYAL	2009-04-27	Dairyland Labs	8s5286	**8**	**17**	7.0	3.6	36	144	0	15
BW2		40.4	LoB	LOYAL	2020-10-15	Dairyland Labs	8S7464	**8**	**8**	7.3	4.0	35	84	6.6	13
BW2		40.4	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**8**	**5**	6.8	4.0	25	70	0	14
BW2		40.4	LoB	LOYAL	2012-09-21	Dairyland Labs	8S3939	**8**	**8**	7.1	3.9	29	202	0	0
BW2		40.4	LoB	LOYAL	2009-04-27	Dairyland Labs	8s5286	**8**	**17**	7.0	3.6	36	144	0	15
C1-C2		51.9	LoB	LOYAL	2020-10-30	Dairyland Labs	8S8961	**10**	**11**	6.8	3.8	21	49	5.5	11
C1-C2		51.9	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**10**	**8**	6.7	4.2	21	66	0	13
C1-C2		51.9	LoB	LOYAL	2012-10-24	Dairyland Labs	8S5585	**10**	**6**	6.8	3.9	29	76	0	0
C1-C2		51.9	LoB	LOYAL	2012-09-21	Dairyland Labs	8S3939	**10**	**4**	6.6	4.2	28	131	0	0
C1-C2		51.9	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1962	**10**	**30**	6.9	3.8	21	67	0	13
C3-C4		24.6	LoB	LOYAL	2020-10-30	Dairyland Labs	8S8961	**5**	**5**	6.5	4.0	18	40	7	11
C3-C4		24.6	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**5**	**9**	6.5	3.8	20	68	0	13
C3-C4		24.6	LoB	LOYAL	2012-10-24	Dairyland Labs	8S5585	**5**	**5**	6.6	3.7	19	81	0	0
C3-C4		24.6	LoB	LOYAL	2012-09-21	Dairyland Labs	8S3939	**5**	**2**	6.6	4.7	31	118	0	0
C3-C4		24.6	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1962	**5**	**30**	6.9	3.8	21	67	0	13
D1		58.4	LoB	LOYAL	2020-10-30	Dairyland Labs	8S8961	**12**	**12**	6.9	3.7	22	68	6	11
D1		58.4	LoB	LOYAL	2016-11-03	Dairyland Labs	8S4050	**12**	**12**	6.9	3.1	14	48	0	11

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
D1		58.4	LoB	LOYAL	2012-10-31	Dairyland Labs	8S6017	**12**	**12**	6.9	3.6	19	71	0	0
D1		58.4	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1963	**12**	**11**	7.0	3.8	16	60	0	12
David North		15.9	LoB	LOYAL	2020-09-16	Dairyland Labs	8S6053	**3**	**3**	6.9	3.3	55	63	0	12
David North		15.9	LoB	LOYAL	2017-04-20	Dairyland Labs	8S8697	**3**	**4**	7.2	3.4	72	112	0	14
David North		15.9	LoB	LOYAL	2017-01-30	Fake Soil Sample		**3**	**1**	6.2	3.2	25	70	0	0
David South		33	LoB	LOYAL	2020-09-16	Dairyland Labs	8S6053	**7**	**7**	6.2	3.1	25	54	0	9
David South		33	LoB	LOYAL	2017-04-20	Dairyland Labs	8S8697	**7**	**7**	6.5	3.2	39	119	0	11
David South		33	LoB	LOYAL	2017-01-30	Fake Soil Test		**7**	**1**	6.2	3.1	18	76	0	0
EF		68.7	LoB	LOYAL	2020-10-15	Dairyland Labs	8S7464	**14**	**14**	6.4	4.2	13	63	4	10
EF		68.7	LoB	LOYAL	2016-11-03	Dairyland Labs	8S4050	**14**	**14**	6.6	3.3	13	50	0	10
EF		68.7	LoB	LOYAL	2012-11-01	Dairyland Labs	8S6112	**14**	**14**	6.5	4.1	14	80	0	0
EF		68.7	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1964	**14**	**7**	6.8	4.0	13	80	0	14
G-1		46.2	LoB	LOYAL	2020-11-12	Dairyland Labs	8S0499	**9**	**10**	6.8	2.6	13	31	2.3	10
G-1		46.2	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**9**	**8**	6.3	3.2	14	40	0	11
G-1		46.2	LoB	LOYAL	2012-10-31	Dairyland Labs	8S6017	**9**	**8**	6.8	3.7	18	64	0	0
G-1		46.2	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1961	**9**	**8**	6.9	3.7	20	60	0	14
G-2		7.1	LoB	LOYAL	2020-11-12	Dairyland Labs	8S0499	**1**	**2**	6.6	2.5	11	32	2.6	10
G-2		7.1	LoB	LOYAL	2016-10-11	Dairyland Labs	8S2910	**1**	**2**	6.4	3.8	13	37	0	12
G-2		7.1	LoB	LOYAL	2012-10-24	Dairyland Labs	8S5585	**1**	**2**	6.8	3.7	18	76	0	0

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
G-2		7.1	LoB	LOYAL	2008-11-05	Dairyland Labs	8s1961	**1**	**2**	6.7	4.0	19	55	0	13
Gideon		37.9	LoB	LOYAL	2023-12-05	Rock River	280512	**8**	**1**	6.8	3.4	15	53	0	12
Gideon		37.9	LoB	LOYAL	2019-11-21	Dairyland Labs	8S6480	**8**	**8**	6.9	3.4	12	27	0	10
Gideon		37.9	LoB	LOYAL	2019-04-09	Fake Test		**8**	**1**	6.0	3.0	100	100	0	0
H-1		40.8	HeB	HILES	2020-11-12	Dairyland Labs	8S0499	**8**	**9**	6.5	2.1	11	53	0	7
H-1		40.8	HeB	HILES	2016-11-03	Dairyland Labs	8S4050	**8**	**9**	6.3	2.8	12	50	0	8
H-1		40.8	HeB	HILES	2012-09-21	Dairyland Labs	8S3939	**8**	**9**	6.5	3.1	13	159	0	0
H-1		40.8	HeB	HILES	2008-11-05	Dairyland Labs	8s1961	**8**	**8**	7.1	2.8	21	114	0	13
Miller		14.6	LoB	LOYAL	2022-10-13	Rock River Laboratory	263713	**3**	**3**	6.3	2.7	10	48	0	13
Miller		14.6	LoB	LOYAL	2022-02-09	Fake Test		**3**	**1**	6.0	3.0	100	100	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2022	2023	2024	2025	2026	2027	2028
AN	2020-09-16				X			
AS	2020-09-16				X			
BE	2020-09-16				X			
BW1	2020-09-16				X			
BW2	2020-10-15				X			
C1-C2	2020-10-30				X			
C3-C4	2020-10-30				X			
D1	2020-10-30				X			
David North	2020-09-16				X			
David South	2020-09-16				X			

Field Name	Soil Test Date	2022	2023	2024	2025	2026	2027	2028
EF	2020-10-15				X			
G-1	2020-11-12				X			
G-2	2020-11-12				X			
Gideon	2023-12-05							X
H-1	2020-11-12				X			
Miller	2022-10-13						X	

FM2: Application Summary Report

Starting Year	**2022**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date:	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Annual Manure Production And Use By Source

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

Source		2022	2023	2024	2025	2026	2027	2028
Liquid	Production (Gallons)	1,620,000	1,620,000	1,620,000	1,620,000	1,620,000	1,620,000	1,620,000
	Used (Gallons)	1,559,600	1,438,500	1,622,700	1,622,100	1,619,800	1,601,100	1,612,210
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17
	Dry Matter (%)	6	6	6	6	6	6	6
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solid	Production (Tons)	800	800	800	800	800	800	800
	Used (Tons)	813	782	755	788	816	716	816
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33	33	33	33	33
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Application Results Reported For Farm All

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2022	2023	2024	2025	2026	2027	2028
Produced from Manure (lb)	Ninj	21,840	21,840	21,840	21,840	21,840	21,840	21,840
	P2O5	12,120	12,120	12,120	12,120	12,120	12,120	12,120
	K2O	32,340	32,340	32,340	32,340	32,340	32,340	32,340
Total Available Manure Nutrients Applied (lb)	Ninj	21,154	19,608	21,737	21,829	21,886	21,361	21,795
	P2O5	11,797	10,977	12,001	12,097	12,167	11,755	12,121
	K2O	31,391	29,147	32,116	32,304	32,433	31,515	32,304
Total Fertilizer Nutrients Applied (lb)	N	25,849	22,319	23,056	33,480	30,999	35,696	31,335
	P2O5	6,600	0	16,772	19,074	19,636	19,418	19,805
	K2O	18,433	0	34,696	33,929	37,904	34,446	38,818
Total Crop Removal (lb)	P2O5	29,768	30,524	28,755	33,875	31,068	34,234	30,726
	K2O	67,528	63,930	59,066	72,277	68,451	74,868	69,642
Nutrient Balance (Applied - Crop removal, lb)	P2O5	-11,371	-19,547	18	-2,704	735	-3,061	1,200
	K2O	-17,704	-34,783	7,747	-6,044	1,886	-8,906	1,480

NM4: Manure Tracking Report

Starting Year	**2024**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date:	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Acres/ CropYear	2024	2025	2026	2027	2028
Acres in plan	554.6	554.6	554.6	554.6	554.6
Acres receiving manure	309.3	265.5	267.7	262.9	274.1

Annual Manure Production And Use By Source

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

Source		2024	2025	2026	2027	2028
Liquid	Production (Gallons)	1,620,000	1,620,000	1,620,000	1,620,000	1,620,000
	Used (Gallons)	1,622,700	1,622,100	1,619,800	1,601,100	1,612,210
	Analysis Date	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17	7/10/12-6-17
	Dry Matter (%)	6	6	6	6	6
	Total Value	0.00	0.00	0.00	0.00	0.00
Solid	Production (Tons)	800	800	800	800	800
	Used (Tons)	755	788	816	716	816
	Analysis Date	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33	33	33
	Total Value	0.00	0.00	0.00	0.00	0.00

Estimated Livestock Manure Production For 2024

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Beef High Forage 750 lbs			50	365	50	0	283	0

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Dairy Youngstock 500 lbs			20	365	50	0	77	0
Dairy Calf 150 lbs			10	365	100	0	24	0
Dairy Calf 250 lbs			20	365	100	0	77	0
Dairy Heifer 1000 lbs			25	365	50	0	187	0
Dairy Heifer 750 lbs			25	365	50	0	148	0
Dairy Lactating Cows 1400 lbs			115	365	0	100	0	1,343,200
Dairy Dry Cows 1400 lbs			30	365	0	100	0	273,750
						Farm Totals	796	1,616,950

Manure Storage For 2024

No Storages Found

Spreaders For 2024

No Spreaders Found

NM3: Field Data and 590 Assessment Plan

Reported For	Malms Rolling Acres
Printed	2024-02-15
Plan Completion/Update Date	2023-02-03
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 555 Total Acres Reported.

Field Name	SubFarm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	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 P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
AN				19.1	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / Edge	No	No	Cg-Sg30-Csl+cv-Cg-Sg30	NT-NT-NT/NTcvr-NT-SVT	2024-2028	**4**	**NA**	**NA**	**NA**	10	-23	-
AS				16.7	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / Edge	No	No	Cg-Sg30-Csl+cv-Cg-Sg30	NT-NT-NT/NTcvr-NT-SVT	2024-2028	**4**	**NA**	**NA**	**NA**	15	-23	-
BE				37.8	Clark	LOYAL LsC	7	175	2.1 - 6	301 - 1000	No / Edge	No	No	Sg30-Csl+cv-Cg-Sg30-Cg	NT-NT/NTcvr-NT-SVT-NT	2024-2028	**5**	**NA**	**NA**	**NA**	17	-17	-
BW1				41.5	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / No	No	No	Sg30-Cg-Sg30-Cg-Sg30	NT-NT-SVT-NT-NT	2024-2028	**4**	**2.3**	**0.5**	**NA**	16	14	-
BW2				40.4	Clark	LOYAL LoB	4	200	2.1 - 6	1001 - 5000	No / No	No	No	Sg30-Cg-Sg30-Cg-Sg30	NT-NT-NT-NT-NT	2024-2028	**4**	**1.5**	**0.6**	**NA**	35	-1	-
C1-C2				51.9	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / Edge	No	No	Cg-Sg30-Csl+cv-Cg-Sg30	NT-NT-NT/NTcvr-NT-NT	2024-2028	**4**	**1.8**	**0.7**	**NA**	21	-29	-
C3-C4				24.6	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / Edge	No	No	Csl+cv-Cg-Sg30-Csl+cv-Cg	NT/NTcvr-SVT-NT-NT/NTcvr-NT	2024-2028	**4**	**NA**	**NA**	**NA**	18	-39	-

Field Name	SubFarm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	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 P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
D1				58.4	Clark	HILES HeB	4	250	2.1 - 6	301 - 1000	No / Edge	No	No	OfAGs-GH-GH-GH-GH	SVT-None-None-None-None	2024-2028	**3**	**0.1**	**1.4**	**NA**	22	1	-
David North				15.9	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / No	No	No	Cg-Sg30-Cg-Sg30-Csl+cv	NT-NT-NT-NT-NT/NTcvr	2024-2028	**4**	**1.8**	**0.6**	**NA**	55	-29	0
David South				33	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / No	No	No	Cg-Sg30-Cg-Sg30-Csl+cv	NT-NT-NT-NT-NT/NTcvr	2024-2028	**4**	**1.8**	**0.6**	**NA**	25	-23	-
EF				68.7	Clark	LOYAL LoB	4	200	0 - 2	301 - 1000	No / No	No	No	Csl+cv-Cg-Sg30-Csl+cv-OfAGs	NT/NTcvr-NT-NT-NT/NTcvr-SVT	2024-2028	**4**	**NA**	**NA**	**NA**	13	-3	-
G-1				46.2	Clark	LOYAL LsC	7	175	2.1 - 6	1001 - 5000	No / Edge	No	No	OfAGs-GH-GH-GH-Cg	SVT-None-None-None-NT	2024-2028	**5**	**0.3**	**1.3**	**NA**	13	-3	-
G-2				7.1	Clark	LOYAL LoB	4	200	0 - 2	1001 - 5000	No / Edge	No	No	OfAGs-GH-GH-GH-Cg	SVT-None-None-None-NT	2024-2028	**4**	**0.2**	**1.3**	**NA**	11	-3	-
Gideon				37.9	Clark	FLAMBEAU FhC	7	150	2.1 - 6	1001 - 5000	No / Edge	No	No	Sg30-Csl+cv-OfAGs-GH-GH	SVT-NT/NTcvr-SVT-None-None	2024-2028	**5**	**NA**	**NA**	**NA**	15	23	-
H-1				40.8	Clark	HILES HeB	4	250	0 - 2	1001 - 5000	No / No	No	No	GH-GH-Cg-Sg30-Csl+cv	None-None-NT-NT-NT/NTcvr	2024-2028	**3**	**0.1**	**1.1**	**NA**	11	1	-
Miller				14.6	Clark	FLAMBEAU FhC	9	150	2.1 - 6	1001 - 5000	No / No	No	No	Sg30-Csl+cv-OfAGs-GH-GH	NT-NT/NTcvr-SVT-None-None	2024-2028	**5**	**0.5**	**1.0**	**NA**	10	14	-

Crop Abbreviations	
Abbreviation	**Crop**
Cg	Corn grain
Csl+cv	Corn silage to small grain cover crop
GH	Grass hay
OfAGs	Oatlage w/ Alfalfa/Grass Seeding Spring
Sg30	Soybeans 30-36 inch row

Tillage Abbreviations	
Abbreviation	**Tillage**
None	None
NT	No Till
NT/NTcvr	No Till, cover crop no till
SVT	Spring vertical tillage

FM3: Producer's Plan Report

Crop Year	**2024**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 554.6 Total Acres Reported.

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AN	19.1	Alfalfa None	Corn grain No Till	165-100-90	120	12	59-37-63	191-37-63	26-0-0	0-63-27	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	191 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,820 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	57 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	191 lb
											Solid 2-3-6	10 ton	Spring Unincorp	191 ton
											legume		120-0-0	
AS	16.7	Alfalfa None	Corn grain No Till	165-90-90	120	12	59-37-63	191-37-63	26-0-0	0-53-27	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	167 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,340 lb

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AS	16.7	Alfalfa None	Corn grain No Till	165-90-90	120	12	59-37-63	191-37-63	26-0-0	0-53-27	Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	50 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	167 lb
											Solid 2-3-6	10 ton	Spring Unincorp	167 ton
											legume		120-0-0	
BE	37.8	Corn grain No Till	Soybeans 30-36 inch row No Till	0-70-115	0	8	18-49-103	26-49-103	26-0-0	0-21-12	Borate 0-0-0	10 lb	Spring Unincorp	378 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	3,780 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	9,450 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	7,560 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	57 gal
BW1	41.5	Grass hay None	Soybeans 30-36 inch row No Till	0-40-115	0	12	28-64-133	40-64-133	40-24-18	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	415 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,150 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	10,375 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,300 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	62 gal
											Solid 2-3-6	5 ton	Spring Unincorp	208 ton
BW2	40.4	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-100	0	8	18-49-103	26-49-103	26-49-3	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	404 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,040 lb

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BW2	40.4	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-100	0	8	18-49-103	26-49-103	26-49-3	0-0-0	Gypsum 0-0-0	250 lb	Spring Unincorp	10,100 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,080 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	61 gal
C1-C2	51.9	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-60-90	0	24	123-49-122	147-49-122	0-0-32	18-11-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	519 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	10,380 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	156 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	519 lb
											Liquid 12-6-17	7000 gal	Spring Subsurface	363,300 gal
C3-C4	24.6	Soybeans 7-10 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-80-240	0	0	159-67-173	159-67-173	39-0-0	0-13-67	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	246 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	4,920 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	74 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	246 lb
											Liquid 12-6-17	10000 gal	Fall Subsurface	246,000 gal

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
D1	58.4	Soybeans 30-36 inch row No Till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-0-165	20	0	48-35-100	68-35-100	48-35-0	0-0-65	Borate 0-0-0	10 lb	Spring Unincorp	584 lb
											Borate 0-0-0	5 lb	Summer Unincorp	292 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	4,380 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	11,680 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	8,760 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	5,840 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	5,840 lb
											Urea 46-0-0	75 lb	Spring Unincorp	4,380 lb
											legume		20-0-0	
David North	15.9	Soybeans 7-10 inch row No Till	Corn grain No Till	120-0-90	0	0	146-43-105	146-43-105	26-43-15	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	159 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	159 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,180 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	48 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	159 lb
											Liquid 12-6-17	6000 gal	Spring Subsurface	95,400 gal
David South	33	Soybeans 7-10 inch row No Till	Corn grain No Till	120-60-90	0	0	158-49-122	158-49-122	38-0-32	0-11-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	330 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	330 gal

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
David South	33	Soybeans 7-10 inch row No Till	Corn grain No Till	120-60-90	0	0	158-49-122	158-49-122	38-0-32	0-11-0	Gypsum 0-0-0	200 lb	Spring Unincorp	6,600 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	99 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	330 lb
											Liquid 12-6-17	7000 gal	Spring Subsurface	231,000 gal
EF	68.7	Soybeans 7-10 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-110-240	0	0	159-67-173	159-67-173	39-0-0	0-43-67	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	687 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	13,740 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	206 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	687 lb
											Liquid 12-6-17	10000 gal	Fall Subsurface	687,000 gal
G-1	46.2	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-60-165	0	23	48-35-100	71-35-100	51-0-0	0-25-65	Borate 0-0-0	10 lb	Spring Unincorp	462 lb
											Borate 0-0-0	5 lb	Summer Unincorp	231 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	3,465 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	9,240 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	6,930 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	4,620 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	4,620 lb

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
G-1	46.2	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-60-165	0	23	48-35-100	71-35-100	51-0-0	0-25-65	Urea 46-0-0	75 lb	Spring Unincorp	3,465 lb
G-2	7.1	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-60-165	0	23	48-35-100	71-35-100	51-0-0	0-25-65	Borate 0-0-0	10 lb	Spring Unincorp	71 lb
											Borate 0-0-0	5 lb	Summer Unincorp	36 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	532 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	1,420 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	1,065 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	710 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	710 lb
											Urea 46-0-0	75 lb	Spring Unincorp	532 lb
Gideon	37.9	Corn grain No Till	Soybeans 30-36 inch row Spring vertical tillage	0-70-115	0	0	28-64-133	28-64-133	28-0-18	0-6-0	Borate 0-0-0	10 lb	Spring Unincorp	379 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	3,790 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	9,475 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	7,580 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	57 gal
											Solid 2-3-6	5 ton	Spring Unincorp	190 ton
H-1	40.8	Grass hay None	Grass hay None	130-110-295	0	0	96-69-125	96-69-125	0-0-0	34-41-170	Borate 0-0-0	5 lb	Spring Unincorp	204 lb
											Borate 0-0-0	5 lb	Summer Unincorp	204 lb

Field Name	Ac.	2023 Crop and Tillage	2024 Crop and Tillage	Adjusted Crop Need lb/ac	2024 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
H-1	40.8	Grass hay None	Grass hay None	130-110-295	0	0	96-69-125	96-69-125	0-0-0	34-41-170	Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	6,120 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	6,120 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	6,120 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	5,100 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	5,100 lb
											Urea 46-0-0	75 lb	Spring Unincorp	3,060 lb
											Urea 46-0-0	75 lb	Summer Unincorp	3,060 lb
Miller	14.6	Corn grain No Till	Soybeans 30-36 inch row No Till	0-80-115	0	0	18-49-103	18-49-103	18-0-0	0-31-12	Borate 0-0-0	10 lb	Spring Unincorp	146 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,460 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	3,650 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	2,920 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	22 gal

FM3: Producer's Plan Report

Crop Year	**2025**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 554.6 Total Acres Reported.

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AN	19.1	Corn grain No Till	Soybeans 30-36 inch row No Till	0-80-115	0	8	18-49-103	26-49-103	26-0-0	0-31-12	Borate 0-0-0	10 lb	Spring Unincorp	191 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,910 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	4,775 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,820 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	29 gal
AS	16.7	Corn grain No Till	Soybeans 30-36 inch row No Till	0-70-115	0	8	18-49-103	26-49-103	26-0-0	0-21-12	Borate 0-0-0	10 lb	Spring Unincorp	167 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,670 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	4,175 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,340 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	25 gal

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BE	37.8	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-110-240	0	0	170-55-139	170-55-139	50-0-0	0-55-101	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	378 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	378 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	7,560 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	113 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	378 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	302,400 gal
BW1	41.5	Soybeans 30-36 inch row No Till	Corn grain No Till	120-36-72	0	4	158-49-122	162-49-122	42-13-50	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	415 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	415 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,300 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	124 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	415 lb
											Liquid 12-6-17	7000 gal	Spring Subsurface	290,500 gal
BW2	40.4	Soybeans 30-36 inch row No Till	Corn grain No Till	120-0-72	0	0	158-49-122	158-49-122	38-49-50	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	404 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	404 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,080 lb

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BW2	40.4	Soybeans 30-36 inch row No Till	Corn grain No Till	120-0-72	0	0	158-49-122	158-49-122	38-49-50	0-0-0	Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	121 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	404 lb
											Liquid 12-6-17	7000 gal	Spring Subsurface	282,800 gal
C1-C2	51.9	Corn grain No Till	Soybeans 30-36 inch row No Till	0-40-83	0	17	18-49-103	35-49-103	35-9-20	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	519 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	5,190 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	12,975 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	10,380 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	78 gal
C3-C4	24.6	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain Spring vertical tillage	165-60-90	0	24	135-55-139	159-55-139	0-0-49	6-5-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	246 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	4,920 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	74 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	246 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	196,800 gal
D1	58.4	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-0-295	60	0	96-69-125	156-69-125	26-69-0	0-0-170	Borate 0-0-0	5 lb	Spring Unincorp	292 lb
											Borate 0-0-0	5 lb	Summer Unincorp	292 lb

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
D1	58.4	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-0-295	60	0	96-69-125	156-69-125	26-69-0	0-0-170	Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	8,760 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	7,300 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	7,300 lb
											Urea 46-0-0	75 lb	Spring Unincorp	4,380 lb
											Urea 46-0-0	75 lb	Summer Unincorp	4,380 lb
											legume		60-0-0	
David North	15.9	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-100	0	14	18-49-103	32-49-103	32-49-3	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	159 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,590 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	3,975 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,180 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	24 gal
David South	33	Corn grain No Till	Soybeans 30-36 inch row No Till	0-40-83	0	17	18-49-103	35-49-103	35-9-20	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	330 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	3,300 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	8,250 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	6,600 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	50 gal

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
EF	68.7	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-90-90	0	24	135-55-139	159-55-139	0-0-49	6-35-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	687 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	13,740 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	206 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	687 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	549,600 gal
G-1	46.2	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-100-295	40	0	96-69-125	136-69-125	6-0-0	0-31-170	Borate 0-0-0	5 lb	Spring Unincorp	231 lb
											Borate 0-0-0	5 lb	Summer Unincorp	231 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	6,930 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	5,775 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	5,775 lb
											Urea 46-0-0	75 lb	Spring Unincorp	3,465 lb
											Urea 46-0-0	75 lb	Summer Unincorp	3,465 lb
											legume		40-0-0	
G-2	7.1	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-100-295	40	0	96-69-125	136-69-125	6-0-0	0-31-170	Borate 0-0-0	5 lb	Spring Unincorp	36 lb
											Borate 0-0-0	5 lb	Summer Unincorp	36 lb

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
G-2	7.1	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-100-295	40	0	96-69-125	136-69-125	6-0-0	0-31-170	Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	1,065 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	1,065 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	1,065 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	888 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	888 lb
											Urea 46-0-0	75 lb	Spring Unincorp	532 lb
											Urea 46-0-0	75 lb	Summer Unincorp	532 lb
											legume		40-0-0	
Gideon	37.9	Soybeans 30-36 inch row Spring vertical tillage	Corn silage to small grain cover crop No Till, cover crop no till	120-110-222	0	4	104-52-93	108-52-93	0-0-0	12-58-129	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	379 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	379 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	7,580 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	114 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	379 lb
											Solid 2-3-6	15 ton	Spring Unincorp	568 ton
H-1	40.8	Grass hay None	Grass hay None	130-110-295	0	0	96-69-125	96-69-125	0-0-0	34-41-170	Borate 0-0-0	5 lb	Spring Unincorp	204 lb
											Borate 0-0-0	5 lb	Summer Unincorp	204 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	6,120 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	6,120 lb

Field Name	Ac.	2024 Crop and Tillage	2025 Crop and Tillage	Adjusted Crop Need lb/ac	2025 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
H-1	40.8	Grass hay None	Grass hay None	130-110-295	0	0	96-69-125	96-69-125	0-0-0	34-41-170	Gypsum 0-0-0	150 lb	Summer Unincorp	6,120 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	5,100 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	5,100 lb
											Urea 46-0-0	75 lb	Spring Unincorp	3,060 lb
											Urea 46-0-0	75 lb	Summer Unincorp	3,060 lb
Miller	14.6	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-120-240	0	0	104-52-93	104-52-93	0-0-0	16-68-147	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	146 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	146 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	2,920 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	44 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	146 lb
											Solid 2-3-6	15 ton	Spring Unincorp	219 ton

FM3: Producer's Plan Report

Crop Year	**2026**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 554.6 Total Acres Reported.

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AN	19.1	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-120-240	0	0	170-55-139	170-55-139	50-0-0	0-65-101	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	191 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	191 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,820 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	57 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	191 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	152,800 gal
AS	16.7	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-110-240	0	0	170-55-139	170-55-139	50-0-0	0-55-101	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	167 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	167 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,340 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	50 gal

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AS	16.7	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-110-240	0	0	170-55-139	170-55-139	50-0-0	0-55-101	Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	167 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	133,600 gal
BE	37.8	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-90-90	0	19	135-55-139	154-55-139	0-0-49	11-35-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	378 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	7,560 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	113 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	378 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	302,400 gal
BW1	41.5	Corn grain No Till	Soybeans 30-36 inch row Spring vertical tillage	0-27-65	0	17	18-49-103	35-49-103	35-22-38	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	415 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,150 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	10,375 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,300 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	62 gal
BW2	40.4	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-50	0	17	18-49-103	35-49-103	35-49-53	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	404 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,040 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	10,100 lb

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BW2	40.4	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-50	0	17	18-49-103	35-49-103	35-49-53	0-0-0	Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,080 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	61 gal
C1-C2	51.9	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-71-220	0	0	170-55-139	170-55-139	50-0-0	0-16-81	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	519 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	519 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	10,380 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	156 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	519 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	415,200 gal
C3-C4	24.6	Corn grain Spring vertical tillage	Soybeans 30-36 inch row No Till	0-40-66	0	19	18-49-103	37-49-103	37-9-37	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	246 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	2,460 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	6,150 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	4,920 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	37 gal
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Borate 0-0-0	5 lb	Spring Unincorp	292 lb
											Borate 0-0-0	5 lb	Summer Unincorp	292 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	8,760 lb

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Gypsum 0-0-0	150 lb	Spring Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	8,760 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	7,300 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	7,300 lb
											Urea 46-0-0	75 lb	Spring Unincorp	4,380 lb
											Urea 46-0-0	75 lb	Summer Unincorp	4,380 lb
David North	15.9	Soybeans 30-36 inch row No Till	Corn grain No Till	120-0-87	0	0	170-55-139	170-55-139	50-55-52	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	159 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	159 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,180 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	48 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	159 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	127,200 gal
David South	33	Soybeans 30-36 inch row No Till	Corn grain No Till	120-51-70	0	0	170-55-139	170-55-139	50-4-69	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	330 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	330 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	6,600 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	99 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	330 lb

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
David South	33	Soybeans 30-36 inch row No Till	Corn grain No Till	120-51-70	0	0	170-55-139	170-55-139	50-4-69	0-0-0	Liquid 12-6-17	8000 gal	Spring Subsurface	264,000 gal
EF	68.7	Corn grain No Till	Soybeans 30-36 inch row No Till	0-70-66	0	19	18-49-103	37-49-103	37-0-37	0-21-0	Borate 0-0-0	10 lb	Spring Unincorp	687 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	6,870 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	17,175 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	13,740 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	103 gal
G-1	46.2	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Borate 0-0-0	5 lb	Spring Unincorp	231 lb
											Borate 0-0-0	5 lb	Summer Unincorp	231 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	6,930 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	5,775 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	5,775 lb
											Urea 46-0-0	75 lb	Spring Unincorp	3,465 lb
											Urea 46-0-0	75 lb	Summer Unincorp	3,465 lb
G-2	7.1	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Borate 0-0-0	5 lb	Spring Unincorp	36 lb
											Borate 0-0-0	5 lb	Summer Unincorp	36 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	1,065 lb

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
G-2	7.1	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Gypsum 0-0-0	150 lb	Spring Unincorp	1,065 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	1,065 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	888 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	888 lb
											Urea 46-0-0	75 lb	Spring Unincorp	532 lb
											Urea 46-0-0	75 lb	Summer Unincorp	532 lb
Gideon	37.9	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-60-165	0	12	76-59-168	88-59-168	68-0-3	0-1-0	Borate 0-0-0	10 lb	Spring Unincorp	379 lb
											Borate 0-0-0	5 lb	Summer Unincorp	190 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	2,842 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	7,580 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	5,685 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	3,790 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	3,790 lb
											Urea 46-0-0	75 lb	Spring Unincorp	2,842 lb
											Liquid 7-6-17	4000 gal	Spring Unincorp	151,600 gal
H-1	40.8	Grass hay None	Corn grain No Till	125-100-90	0	0	114-67-123	114-67-123	0-0-33	11-33-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	408 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	408 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,160 lb

Field Name	Ac.	2025 Crop and Tillage	2026 Crop and Tillage	Adjusted Crop Need lb/ac	2026 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
H-1	40.8	Grass hay None	Corn grain No Till	125-100-90	0	0	114-67-123	114-67-123	0-0-33	11-33-0	Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	122 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	408 lb
											Solid 2-3-6	20 ton	Spring Unincorp	816 ton
Miller	14.6	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-70-165	0	12	83-65-185	95-65-185	75-0-20	0-5-0	Borate 0-0-0	10 lb	Spring Unincorp	146 lb
											Borate 0-0-0	5 lb	Summer Unincorp	73 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	1,095 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	2,920 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	2,190 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	1,460 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	1,460 lb
											Urea 46-0-0	75 lb	Spring Unincorp	1,095 lb
											Liquid 7-6-17	5000 gal	Spring Unincorp	73,000 gal

FM3: Producer's Plan Report

Crop Year	**2027**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 554.6 Total Acres Reported.

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AN	19.1	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-100-90	0	19	114-67-123	133-67-123	0-0-33	32-33-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	191 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	191 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,820 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	57 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	191 lb
											Solid 2-3-6	20 ton	Spring Unincorp	382 ton
AS	16.7	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-90-90	0	19	114-67-123	133-67-123	0-0-33	32-23-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	167 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	167 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,340 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	50 gal

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AS	16.7	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-90-90	0	19	114-67-123	133-67-123	0-0-33	32-23-0	Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	167 lb
											Solid 2-3-6	20 ton	Spring Unincorp	334 ton
BE	37.8	Corn grain No Till	Soybeans 30-36 inch row Spring vertical tillage	0-70-66	0	19	18-49-103	37-49-103	37-0-37	0-21-0	Borate 0-0-0	10 lb	Spring Unincorp	378 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	3,780 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	9,450 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	7,560 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	57 gal
BW1	41.5	Soybeans 30-36 inch row Spring vertical tillage	Corn grain No Till	120-38-52	0	0	146-43-105	146-43-105	26-5-53	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	415 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	415 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,300 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	124 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	415 lb
											Liquid 12-6-17	6000 gal	Spring Subsurface	249,000 gal
BW2	40.4	Soybeans 30-36 inch row No Till	Corn grain No Till	120-0-22	0	0	146-43-105	146-43-105	26-43-83	0-0-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	404 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	404 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,080 lb

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BW2	40.4	Soybeans 30-36 inch row No Till	Corn grain No Till	120-0-22	0	0	146-43-105	146-43-105	26-43-83	0-0-0	Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	121 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	404 lb
											Liquid 12-6-17	6000 gal	Spring Subsurface	242,400 gal
C1-C2	51.9	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-60-90	0	19	123-49-122	142-49-122	0-0-32	23-11-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	519 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	10,380 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	156 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	519 lb
											Liquid 12-6-17	7000 gal	Spring Subsurface	363,300 gal
C3-C4	24.6	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-71-203	0	0	170-55-139	170-55-139	50-0-0	0-16-64	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	246 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	246 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	4,920 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	74 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	246 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	196,800 gal
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Borate 0-0-0	5 lb	Spring Unincorp	292 lb

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Borate 0-0-0	5 lb	Summer Unincorp	292 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	8,760 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	7,300 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	7,300 lb
											Urea 46-0-0	75 lb	Spring Unincorp	4,380 lb
											Urea 46-0-0	75 lb	Summer Unincorp	4,380 lb
David North	15.9	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-63	0	19	18-49-103	37-49-103	37-49-40	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	159 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,590 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	3,975 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,180 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	24 gal
David South	33	Corn grain No Till	Soybeans 30-36 inch row No Till	0-36-46	0	19	18-49-103	37-49-103	37-13-57	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	330 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	3,300 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	8,250 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	6,600 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	50 gal

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
EF	68.7	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-110-203	0	0	170-55-139	170-55-139	50-0-0	0-55-64	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	687 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	687 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	13,740 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	206 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	687 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	549,600 gal
G-1	46.2	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Borate 0-0-0	5 lb	Spring Unincorp	231 lb
											Borate 0-0-0	5 lb	Summer Unincorp	231 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	6,930 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	6,930 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	5,775 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	5,775 lb
											Urea 46-0-0	75 lb	Spring Unincorp	3,465 lb
											Urea 46-0-0	75 lb	Summer Unincorp	3,465 lb
G-2	7.1	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Borate 0-0-0	5 lb	Spring Unincorp	36 lb
											Borate 0-0-0	5 lb	Summer Unincorp	36 lb

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
G-2	7.1	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	1,065 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	1,065 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	1,065 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	888 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	888 lb
											Urea 46-0-0	75 lb	Spring Unincorp	532 lb
											Urea 46-0-0	75 lb	Summer Unincorp	532 lb
Gideon	37.9	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-100-292	40	9	96-69-125	145-69-125	15-0-0	0-31-167	Borate 0-0-0	5 lb	Spring Unincorp	190 lb
											Borate 0-0-0	5 lb	Summer Unincorp	190 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	5,685 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	5,685 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	5,685 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	4,738 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	4,738 lb
											Urea 46-0-0	75 lb	Spring Unincorp	2,842 lb
											Urea 46-0-0	75 lb	Summer Unincorp	2,842 lb
											legume		40-0-0	
H-1	40.8	Corn grain No Till	Soybeans 30-36 inch row No Till	0-80-82	0	16	18-49-103	34-49-103	34-0-21	0-31-0	Borate 0-0-0	10 lb	Spring Unincorp	408 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,080 lb

Field Name	Ac.	2026 Crop and Tillage	2027 Crop and Tillage	Adjusted Crop Need lb/ac	2027 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
H-1	40.8	Corn grain No Till	Soybeans 30-36 inch row No Till	0-80-82	0	16	18-49-103	34-49-103	34-0-21	0-31-0	Gypsum 0-0-0	250 lb	Spring Unincorp	10,200 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,160 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	61 gal
Miller	14.6	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-110-275	40	12	96-69-125	148-69-125	18-0-0	0-41-150	Borate 0-0-0	5 lb	Spring Unincorp	73 lb
											Borate 0-0-0	5 lb	Summer Unincorp	73 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	2,190 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	2,190 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	2,190 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	1,825 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	1,825 lb
											Urea 46-0-0	75 lb	Spring Unincorp	1,095 lb
											Urea 46-0-0	75 lb	Summer Unincorp	1,095 lb
											legume		40-0-0	

FM3: Producer's Plan Report

Crop Year	**2028**
Reported For	**Malms Rolling Acres**
Printed	**2024-02-15**
Plan Completion/Update Date	**2023-02-03**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

Field Data: 554.6 Total Acres Reported.

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
AN	19.1	Corn grain No Till	Soybeans 30-36 inch row Spring vertical tillage	0-80-82	0	16	18-49-103	34-49-103	34-0-21	0-31-0	Borate 0-0-0	10 lb	Spring Unincorp	191 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,910 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	4,775 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,820 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	29 gal
AS	16.7	Corn grain No Till	Soybeans 30-36 inch row Spring vertical tillage	0-70-82	0	16	18-49-103	34-49-103	34-0-21	0-21-0	Borate 0-0-0	10 lb	Spring Unincorp	167 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	1,670 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	4,175 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	3,340 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	25 gal

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
BE	37.8	Soybeans 30-36 inch row Spring vertical tillage	Corn grain No Till	120-90-53	0	0	170-55-139	170-55-139	50-0-86	0-35-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	378 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	378 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	7,560 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	113 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	378 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	302,400 gal
BW1	41.5	Corn grain No Till	Soybeans 30-36 inch row No Till	0-35-62	0	14	18-49-103	32-49-103	32-14-41	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	415 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,150 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	10,375 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,300 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	62 gal
BW2	40.4	Corn grain No Till	Soybeans 30-36 inch row No Till	0-0-17	0	14	18-49-103	32-49-103	32-49-86	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	404 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	4,040 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	10,100 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	8,080 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	61 gal

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
C1-C2	51.9	Corn grain No Till	Soybeans 30-36 inch row No Till	0-40-83	0	17	18-49-103	35-49-103	35-9-20	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	519 lb
											Diammonium phosphate (DAP) 18-46-0	100 lb	Spring Unincorp	5,190 lb
											Gypsum 0-0-0	250 lb	Spring Unincorp	12,975 lb
											Potassium sulfate 0-0-50	200 lb	Spring Unincorp	10,380 lb
											Starter Eberly Beans 3-18-18	1.5 gal	Spring Subsurface	78 gal
C3-C4	24.6	Corn silage to small grain cover crop No Till, cover crop no till	Corn grain No Till	165-60-90	0	19	135-55-139	154-55-139	0-0-49	11-5-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	246 gal
											32% UAN (Liquid 32-0-0) 32-0-0	0 gal	Summer Unincorp	
											Gypsum 0-0-0	200 lb	Spring Unincorp	4,920 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	74 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	246 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	196,800 gal
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Borate 0-0-0	5 lb	Spring Unincorp	292 lb
											Borate 0-0-0	5 lb	Summer Unincorp	292 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	8,760 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	8,760 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	7,300 lb

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
D1	58.4	Grass hay None	Grass hay None	130-0-295	0	0	96-69-125	96-69-125	0-69-0	34-0-170	Potassium sulfate 0-0-50	125 lb	Summer Unincorp	7,300 lb
											Urea 46-0-0	75 lb	Spring Unincorp	4,380 lb
											Urea 46-0-0	75 lb	Summer Unincorp	4,380 lb
David North	15.9	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-0-200	0	0	170-55-139	170-55-139	50-55-0	0-0-61	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	159 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	159 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	3,180 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	48 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	159 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	127,200 gal
David South	33	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	120-67-183	0	0	170-55-139	170-55-139	50-0-0	0-12-44	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	330 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	330 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	6,600 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	99 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	330 lb
											Liquid 12-6-17	8000 gal	Fall Subsurface	264,000 gal

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
EF	68.7	Corn silage to small grain cover crop No Till, cover crop no till	Oatlage w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-60-165	0	19	78-61-173	97-61-173	77-1-8	0-0-0	Borate 0-0-0	10 lb	Spring Unincorp	687 lb
											Borate 0-0-0	5 lb	Summer Unincorp	344 lb
											Diammonium phosphate (DAP) 18-46-0	75 lb	Spring Unincorp	5,152 lb
											Gypsum 0-0-0	200 lb	Spring Unincorp	13,740 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	10,305 lb
											Potassium sulfate 0-0-50	100 lb	Spring Unincorp	6,870 lb
											Potassium sulfate 0-0-50	100 lb	Summer Unincorp	6,870 lb
											Urea 46-0-0	75 lb	Spring Unincorp	5,152 lb
											Liquid 7-6-17	4300 gal	Spring Unincorp	295,410 gal
G-1	46.2	Grass hay None	Corn grain No Till	165-90-90	0	0	170-55-139	170-55-139	5-0-49	0-35-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	462 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	462 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	9,240 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	139 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	462 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	369,600 gal
G-2	7.1	Grass hay None	Corn grain No Till	165-90-90	0	0	170-55-139	170-55-139	5-0-49	0-35-0	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	71 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	71 gal

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
G-2	7.1	Grass hay None	Corn grain No Till	165-90-90	0	0	170-55-139	170-55-139	5-0-49	0-35-0	Gypsum 0-0-0	200 lb	Spring Unincorp	1,420 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	21 gal
											Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	71 lb
											Liquid 12-6-17	8000 gal	Spring Subsurface	56,800 gal
Gideon	37.9	Grass hay None	Grass hay None	130-100-295	0	0	96-69-125	96-69-125	0-0-0	34-31-170	Borate 0-0-0	5 lb	Spring Unincorp	190 lb
											Borate 0-0-0	5 lb	Summer Unincorp	190 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	5,685 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	5,685 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	5,685 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	4,738 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	4,738 lb
											Urea 46-0-0	75 lb	Spring Unincorp	2,842 lb
											Urea 46-0-0	75 lb	Summer Unincorp	2,842 lb
H-1	40.8	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	100-120-219	0	0	114-67-123	114-67-123	14-0-0	0-53-96	32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Spring Unincorp	408 gal
											32% UAN (Liquid 32-0-0) 32-0-0	10 gal	Summer Unincorp	408 gal
											Gypsum 0-0-0	200 lb	Spring Unincorp	8,160 lb
											Stater Eberly Projected 10-20-10	3 gal	Spring Subsurface	122 gal

Field Name	Ac.	2027 Crop and Tillage	2028 Crop and Tillage	Adjusted Crop Need lb/ac	2028 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
H-1	40.8	Soybeans 30-36 inch row No Till	Corn silage to small grain cover crop No Till, cover crop no till	100-120-219	0	0	114-67-123	114-67-123	14-0-0	0-53-96	Zinc Sulfate 0-0-0	10 lb	Spring Unincorp	408 lb
											Solid 2-3-6	20 ton	Spring Unincorp	816 ton
Miller	14.6	Grass hay None	Grass hay None	130-110-295	0	0	96-69-125	96-69-125	0-0-0	34-41-170	Borate 0-0-0	5 lb	Spring Unincorp	73 lb
											Borate 0-0-0	5 lb	Summer Unincorp	73 lb
											Diammonium phosphate (DAP) 18-46-0	150 lb	Summer Unincorp	2,190 lb
											Gypsum 0-0-0	150 lb	Spring Unincorp	2,190 lb
											Gypsum 0-0-0	150 lb	Summer Unincorp	2,190 lb
											Potassium sulfate 0-0-50	125 lb	Spring Unincorp	1,825 lb
											Potassium sulfate 0-0-50	125 lb	Summer Unincorp	1,825 lb
											Urea 46-0-0	75 lb	Spring Unincorp	1,095 lb
											Urea 46-0-0	75 lb	Summer Unincorp	1,095 lb

WQ1: P Trade Report

Reported For	Malms Rolling Acres
Printed	2024-02-15
Plan Completion/Update Date	2023-02-03
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\egotham\Desktop\Water Quality trading plan 2024\Mitch Malm \1 29 snap trial runs\final runs\Malm Robert - no till +filte strips - Cover after Silage and tillage -2-6 - Copy.snapDb	

Prepared for:
Malms Rolling Acres
attn:Mitch and Bob Malm

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

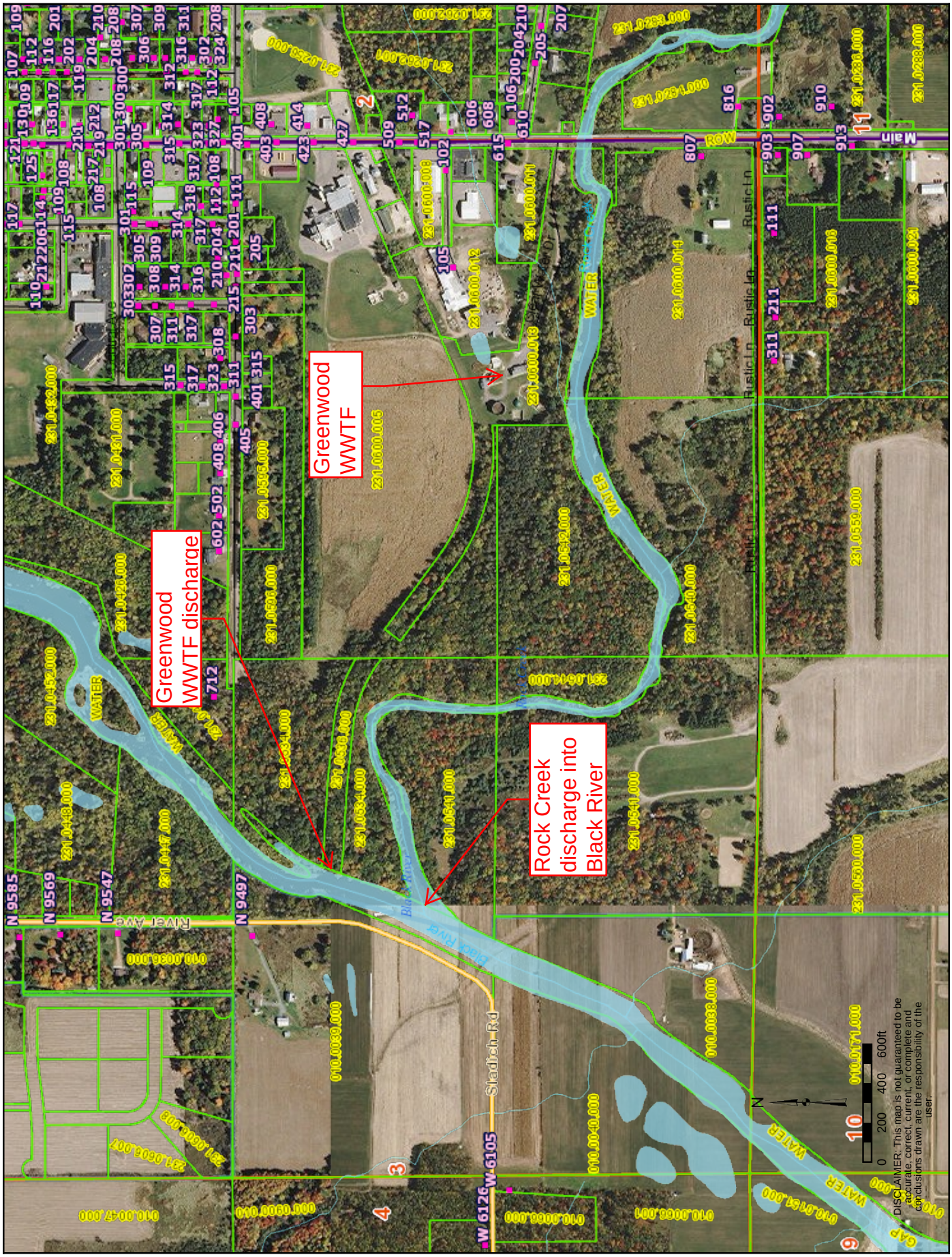
For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

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

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028
AN	LOYAL	LoB	19	8	3	4	16	7
AS	WITHEE	WeA	17	7	2	2	13	4
BE	LOYAL	LoB	38	6	10	12	22	25
BW1	LOYAL	LoB	42	9	22	65	114	78
BW2	LOYAL	LoB	40	11	40	33	77	55
C1-C2	LOYAL	LoB	52	26	31	31	25	31
C3-C4	LOYAL	LoB	25	14	13	18	20	13

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028
D1	LOYAL	LoB	58	41	33	20	13	11
David North	LOYAL	LoB	16	33	22	31	23	39
David South	LOYAL	LoB	33	58	38	54	40	68
EF	LOYAL	LoB	69	119	135	110	193	160
G-1	LOYAL	LoB	46	30	25	15	9	4
G-2	LOYAL	LoB	7	4	4	2	1	1
Gideon	LOYAL	LoB	38	34	71	38	24	14
H-1	HILES	HeB	41	3	2	5	3	11
Miller	LOYAL	LoB	15	7	12	18	7	4
Total			**555**	**412**	**462**	**459**	**602**	**523**


Greenwood WWTF
Greenwood WWTF discharge
Rock Creek discharge into Black River
Black River
Shadrich Rd
River Ave
Rustic Ln
Main
ROW
WATER
0 200 400 600ft
DISCLAIMER: This map is not guaranteed to be accurate, correct, current, or complete and conclusions drawn are the responsibility of the user.

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
City of Greenwood	WI- 0020249-10	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Kayla Schar	102 N. Main Street	Greenwood	WI	54437

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 ◉ Agricultural NPS ◯ Other	amendment to WQT-2019-0006 for additional fields for Malm farms, acquired in 2019	notill/reduced tillage, cover crops, filter/buffer strips	200	1.2:1	Snap plus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Clark	Black River	see attached	Phosphorus

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Tammy Lothan	12-18-19

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Kayla Schar	12/26/2019

Leave Blank – For Department Use Only

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

MALM

ATTACHMENT G

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
City of Greenwood	WI- 020249-09	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Lonna Klinke	102 N. Main Street	Greenwood	WI	54437

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 ◉ Agricultural NPS ○ Other		Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips	1,000	1.2:1	Snap plus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Clark	Black River	see attached maps	Phosphorous

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
Tom Lotham	8-6-18

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
Lonna Klinke	8-6-18

Leave Blank – For Department Use Only

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

MALM
ATTACHMENT H

Larry Gotham

To: Ezra Gotham (egotham@centurytel.net)
Subject: FW: Greenwood WQT

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

From: Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
Sent: Tuesday, September 12, 2017 8:53 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
Subject: RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

From: Fassbender, Lori - DNR
Sent: Monday, September 11, 2017 4:55 PM
To: Larry Gotham <lgotham@centurytel.net>
Cc: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Subject: RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

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

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

From: Larry Gotham [mailto:lgotham@centurytel.net]
Sent: Friday, March 31, 2017 10:22 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
Subject: Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

Larry Gotham

From: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Sent: Friday, February 02, 2018 9:17 AM
To: Larry Gotham; Fassbender, Lori - DNR
Cc: Ezra Gotham; Hartenbower, Benjamin P - DNR
Subject: RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

From: Larry Gotham [mailto:lgotham@centurytel.net]
Sent: Thursday, February 01, 2018 2:05 PM
To: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
Cc: Ezra Gotham <egotham@centurytel.net>
Subject: RE: Greenwood WQT

Hi Pat:
Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.

Larry Gotham, P.E., R.L.S.

Operation, Maintenance & inspection Plan
Malm Farm
For Water Quality Trading
City of Greenwood

The goal of the operation and maintenance plan is to ensure that conservation practices applied on the Malm farm are being operated and maintained properly, to generate the phosphorus credits used by the City of Greenwood WWTF. The filter strips will be operated to maintain a high stem count and stand persistence. The primary purpose of the grass cover is to trap the phosphorus and sediments that leave the farm fields and degrade water quality. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop. No till/reduced tillage and cover crops will be used to increase infiltration of water and lower the amount of sediments carried by runoff to the filter strips.

Conservation practices requiring Operation Maintenance, and Inspection

1. Filter Strips

Section 1 - Seeding Year

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** will either be as oatlage or as grain and straw. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6” or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6” or after September 1st.

E. **Inspection Frequency** shall be **Quarterly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist (Clark County) or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

Section 2 – 2nd Year and beyond

A. Weed Management,

- Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
- Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edged. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for reduced growth.

B. Erosion control. It is unlikely that there will be erosion issues or gully formation after the first year. If erosion becomes evident it will be repaired as listed below:

- Erosion will be filled by tillage or by importing topsoil
- The area will be seeded with the original grass mix as listed in the water quality trading plan.
- Erosion mat will be applied to the reseeded area.
- American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.

C. Harvesting. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand, minimum 1 time per year late summer. .

- The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
- Frequency of the cutting will be dictated by the regrowth and stand density required.
- The filter strip should not be harvested after September 1st to allow sufficient re-growth for winter ground cover but not too much cover to restrict spring re-growth.
- The harvested hay will be removed from the site upon harvest and shall not be stored on the filter strips.

D. Nutrient Management. The filter strips should not be fertilized but will be operated to draw down the phosphorus levels in the deposited sediments. This will be done by removing the grass hay crop and not replacing the nutrients as required by soil samples. If the desired species composition and high stand count is not being maintained, a soil sample of the filter strip will be taken to determine if an application of nutrients may be required to maintain the desired species composition and high stand count. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the stand.

E. Inspection is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be quarterly during the growing season. The following inspection and reporting procedure shall be used:

- **Quarterly Reporting (<u>seeding year</u>) -** Each Quarter the Soil Conservationist or Engineer shall file the report with the City Clerk or operator assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>second year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a

statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.

- **Notification of Problems with Grass Filter Strips -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The Farmer and City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

2. **Grassed waterways**. Inspect on a quarterly basis for active gully erosion; a first quarter inspection will be waived if the waterways are snow covered. In the event that an active nonvegetated gully is found on a field the DNR shall be notified; this may result in reduced credits or fields not being able to generate credits. In the rare event that an active nonvegetated gully forms it should be repaired as listed below:
    a. Erosion will be filled by tillage or by importing topsoil
    b. The area will be seeded with a grass mix.
    c. Erosion mat or mulch will be applied to the seeded area.
    d. American Excelsior Curlex Sediment logs or bale ditch checks will be placed at 2' vertical drop intervals along the center of the repaired gully.

3. **No Till/reduced tillage**. Inspect that the proper tillage practice was followed, according to the Water Quality Trading plan. Inspection shall be reported on the form on page 4. Semi Annual reporting shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk or Operator. The Operator shall make a note on his monthly discharge report (May or June) that No till/reduced tillage was followed according to the Water Quality Trading Plan.
    A. Corn and Soybeans are-No tilled
    B. Perennial Forage – No till or Vertical tillage or equivalent STIR rating
    C. Cover Crop No till or broadcast
    D. One field was modeled each year with tillage to allow corrective tillage to repair damage that would cause further erosion. The field being repaired may or may not be the field modeled with tillage. Tillage is not planned outside of corrective purposes.
4. **Cover Crop after Corn Silage** Inspection shall be reported on the form on page 4. Semi annual reporting shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk or Operator. The Operator shall make a note on his monthly discharge report (September or October) that the cover crop after corn silage was seeded according to the Water Quality Trading Plan.
    A. Refer to Attachment D of the Water Quality Trading plan for installation, Operation and Maintenance of cover crops.
    B. Verify the Cover Crop was seeded with at least 1 Photo fall
    C. Verify in the spring that the cover crop overwintered winter, with at least 1 photo.
    D. If the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop, or an emergency small grain cover crop can be seeded, if the farmer and the City decide to do so. The emergency cover crop will need to be seeded according to Wisconsin Agronomy
    Technical Note 7 (Attachment D)

WATER QUALITY TRADING INSPECTION FORM
MALM FARM
CITY OF GREENWOOD
LOCATION: SECTION 19, 20, 27, 28, & 29, T.27N. – R.1W.

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual

Practice compliance (check appropriate box)

No till/reduced tillage ☐

Cover Crop after Corn Silage ☐ Photo taken ☐ Fall/Spring

Filter strip ☐

Waterway inspection quarterly ☐

Crop and Nutrient Application summary at Fall inspection ☐

Fall inspection update SnapPlus with crops, nutrient applications, and tillage ☐

Summary of findings:

_____

_____

_____

_____

_____

Identification of Items of non-compliance:

_____

_____

_____

Corrective measures required:

_____

_____

_____

Notice of **non-compliance** to the DNR required: Yes: _____ No: _____

Phosphorus credits used by City (annual report only): _____

Phosphorus credits available (annual report only): _____

Phosphorus credits deductions for failed practice

Field #	Failed practice & reason	Credit Deduction

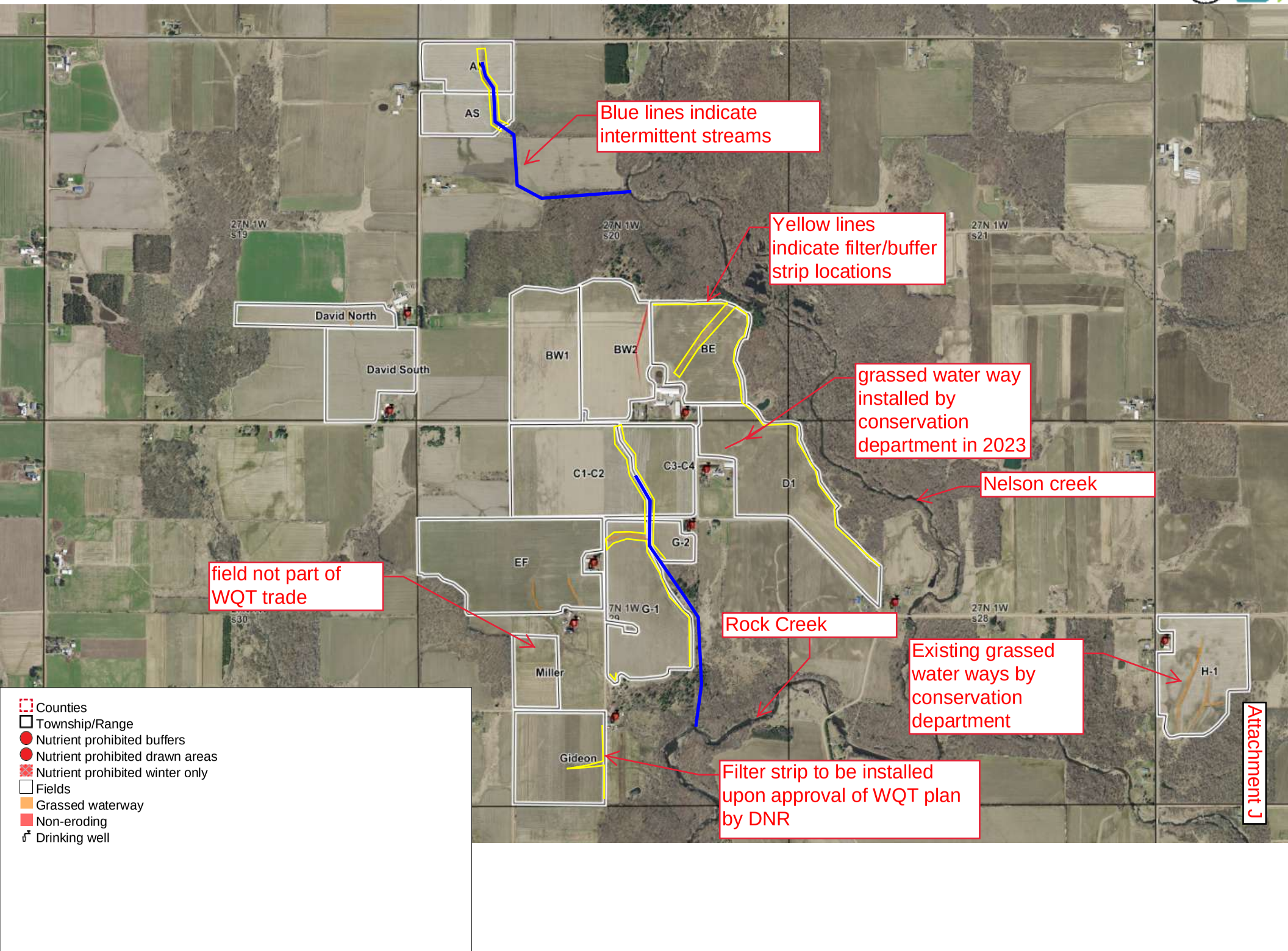
Crop and applications Summary at fall inspection: (or attach summary)

FIELD #	# OF PHOTOS TAKEN	CROP	NUTRIENT APPLICATION SUMMARY AND NOTES, OR ATTACH UPDATED PRODUCER PLAN FROM SNAPPLUS
H-1			
D1			
Gideon			
G-1			
G-2			
EF			
C1-C2			

C3-C4			
BE			
BW2			
BW1			
DAVID NORTH & SOUTH			
AN & AS			
EF			

Attachment J

Farm: Malms Rolling Acres, V20 Generated:2/15/2024, Crop year: 2024, Township Range Section:27N 1W s28



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
City of Greenwood	WI- 020249-10	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Kayla Schar	201 S. Main Street	Greenwood	WI	54437

Project Name

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Black River	Phosphorus	070400070405

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: See Attachment A
- ○ 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				

Water Quality Trading Checklist

Form 3400-208 (1/14)

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	Filter strips, reduced tillage, cover crops	Snap-plus	not assigned	◉ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part

Does plan have a narrative that describes:			Plan Section
a. Description of existing land uses	◉ Yes	◯ No	C-1, Sec D-E
b. Management practices used to generate credits	◉ Yes	◯ No	C-1, Sec. F
c. Amount of credit being generated	◉ Yes	◯ No	C-1, Sec. K
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	C-1, Sec. G
e. Location where credits will be generated	◉ Yes	◯ No	Attachment A
f. Timeline for credits and agreements	◉ Yes	◯ No	C-1 Sec. H
g. Method for quantifying credits	◉ Yes	◯ No	C-1 Sec. F

Water Quality Trading Checklist

Form 3400-208 (1/14) Page 3 of 3

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	C-1 Sec. I
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	C-1 Sec. P
j. Reporting requirements should the management practice fail	◉ Yes	○ No	C-1 Sec. O
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	C-1 Sec. F
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	Attachment F
m. Practice registration documents, if available	◉ Yes	○ No	Attachment G
n. History of project site(s)	◉ Yes	○ No	C-1, Sec D-E
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
Tony Sattam	2-20-24

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
Kayla Wanar	2-20-2024

ATTACHMENT L

Certification of Section C-1 of The Water Quality Trading Plan

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schar

Kayla Schar, City Clerk

Project Engineer:

Larry Gotham 2-20-24

Larry Gotham P.E., Morgan & Parmley Ltd.

C-2 Trading Partner Plan

Wayne Riethmiller

C-2 TRADING PARTNER: WAYNE RIETHMILLER

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Q. DNR Right of Entry 8
R. Compliance with Water Quality Trading Checklist 8

REITHMILLER FARM ATTACHMENTS:

A. HUC 12 Map

B. Riethmiller Farm Map

C. SnapPlus Reports, Existing Conditions

D. Farm Location Map

E. SnapPlus Reports, Proposed Conditions

F. Riethmiller Farm Discharge Point

G. Management Practice Registration Form

H. DNR Trade Ratio Calculation

I. Operation and Maintenance Manual

J. No Field Edge Filter

K. Water Quality Trading Checklist

L. Certification of Section C-2 of the Water Quality Trading Plan

M. Verification of Cropping and use of Moldboard by County Conservationist

N. Photos of Moldboard plow used by Riethmiller

O. Soils Map

P. 2019 Inspection Photos

Q. Soil Test 2023

C-2 <u>TRADING PARTNER</u>: WAYNE RIETHMILLER

A. EXECUTIVE SUMMARY:

The field we propose to continue using as a Phosphorus trade is on the home farm of Wayne Riethmiller. His home farm located in Section 8 consists of 80 acres where he had milked 25 cows and housed the accompanying young stock. Wayne owns additional 270± acres in Section 17 & 18 (see Attachment D, area marked in orange is operated by Wayne). He has crops on approximately 30 acres of that farm, the remainder is rented to a neighbor (and historically has been). We will not be generating credit on any portion of the other farm, because the portion Wayne has control over is in HUC 070400070501.

The 20± acre field selected for this trade is located on the home farm in Section 8 and was converted from corn silage, using moldboard plowing, to a conservation easement in perennial vegetation, harvested for hay. The credit will be generated through perennial vegetation which reduces tillage. Credit will also be generated by no longer spreading manure in the winter. Wayne sold his dairy herd in 2018 so he will no longer have dairy manure to spread on a daily basis. The field in the trade was previously reserved for spreading in the winter, when the weather was too inclement to spread on fields in Section 17 (see orange highlighted area on attachment D). The 20± acre field has a direct discharge into a drainage ditch which meanders to the Black River, and also falls within a SWQMA which prohibits winter spreading.

The 20± acre field will generate on average, approximately 199 lb. of potentially tradable phosphorus. The proposed trade ratio to be applied will have an Uncertainty Factor 1:1, Equivalency Factor N/A, Downstream Trading Factor of 1.1:1. The proposed minimum trade ratio is 1.2:1 (*Tradeable Phosphorus of 199/1.2 = 166*) see table 4 for year by year credit generation. This WQT plan update will use the same SnapPlus Model as WQT plan WQT-2019-0006, because the field is in perennial vegetation and operating conditions will not change for this term. The last five years of the SnapPlus model will be used "2019-2023", and brought forward to "2024-2028"; i.e. 2019 will now be known as 2024 and so on. Tillage was used to prepare the seedbed for perennial vegetation in 2018, the following five years in perennial vegetation have no tillage, as such 2018 is not representative of the current conditions, and is not used for Phosphorus credit generation in WQT Plan #2.

B. LOCATION OF AGRICULTURAL PROPERTY: The field we are proposing for this trade is located in the same HUC 12, but downstream of the Greenwood WWTF Outfall. Runoff from this field discharges into the Black River approximately 2600' downstream of the WWTF Outfall, via an intermittent stream. The field is located in the N ½ of the SW ¼ of Section 8, T26N-R2W, Town of Eaton, and Clark County. Attachment A shows the drainage area's HUC 12 map and Attachment B shows the aerial view of the farm and the location of the HUC 12 dividing line.

C. EXISTING OPERATION: Wayne Riethmiller owns 350± acres, 90 acres of which he farms, the remainder of the tillable land is rented to a neighbor. The farm has been home to a milking herd of 25 cows plus associated dry cows, young stock and steers. Manure from the dairy herd was randomly applied to the crop land without the benefit of a nutrient management plan. The primary crop grown is grass hay and corn silage.

D. SOIL SAMPLING: 2018 Soil samples for the field in the trade were collected in accordance with UWEX Publication A2100. All soil samples were tested by the UW lab in Marshfield. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged to create a single recommendation for that field. See Attachment C for results.

E. CROPLAND: There are 90 acres farmed by Wayne, only 20± of those tillable acres will be included in this trade. The 20± acre field labeled as Wayne 1, was converted from silage production to permanent grass hay in 2018. The converted acres were harvested for corn silage in 2016 and 2017.

F. SnapPlus - MODELING: SnapPlus version 17.1 was used to generate the PTP under existing conditions. The existing conditions of the field in this trade were generated from notes taken during a conversation with Wayne and also the site visit to take soil samples.

1. **Previous 2 Years of Cropping History (2016-2017):** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and cropping history from Wayne were made for 2016 and 2017. Both confirmed that the field was corn the past 2 years.
2. **Current Conditions To Be Projected:** The nutrient applications, cropping and tillage data from 2016 and 2017 were projected out to 2023.
3. **Tillage:** The field within this trade was moldboard plowed in 2016 and chisel plowed in 2017.
4. **Rotation:** For this WQT plan the rotation of 2016 Corn Silage and 2017 Corn Silage were projected to 2023 as continuous Corn Silage.
5. **Credit Generation:** The Phosphorus Credits that we will be claiming will be generated through, a perennial vegetative cover with a conservation easement. Perennial vegetation (hay) works to reduce Phosphorus runoff by trapping particulate Phosphorus, and also by no longer tilling the field which increases Phosphorus in runoff. Credit will also be generated by no longer spreading manure in the winter. Wayne sold his dairy herd in 2018 so he will no longer have dairy manure to spread on a daily basis.
6. **Nutrients:** Manure was spread on a daily basis. Fields located in Section 17 (see Attachment D) received roughly 70 percent of the manure. The field in the trade received roughly 30 percent of the manure and was reserved for spreading in the winter when the weather was too inclement to spread on fields in section 17.

G. NUTRIENTS FROM MANURE: The farm, on average, had milked 25 cows and had 5 dry cows. For purposes of calculation: all cows will weigh 1400 pounds; replacement animals: 5 calves up to 250 lb., and 15 heifers' average weight 1000 lb; lactating cows and calves to 250 lb., 100% manure collected as solid; heifers and dry cows 75% of manure collected as solid. Using UW Extension guidelines:

- 1400 lb. Dairy Cow produces 148± lb. of manure per. day
- 1400 lb. Dry Cow produces 115± lb. of manure per. day
- 250 lb. Dairy Calf produces 21 ± lb. of manure per day
- 1000 lb. Heifer produces 82± lb. of manure per day
- [(365 days x 148 lb. x 25/2000 lb.) + (365 days x 115 lb. x 5/2000 lb. x 75%) + (365 days x 21 lb. x 5/2000 lb.) + (365 days x 82 lb. x 15/2000 lb. x 75%)]. = 980 Ton.

H. CROP PRODUCTION: Corn Production: The following nutrient application data was the standard for the corn crop. See Attachment C for specific field application data. The yield goal was 10-15 ton silage. Starter fertilizer and manure were applied to the corn crop in 2016 with no additional Nitrogen sources. Manure was the only nutrient application made to the corn crop in 2017.

- Commercial starter fertilizer 200 lb. per acre of 19-19-19 (2016 only)
- 15± Ton. of manure, total analysis per acre using UW recommendations 30-45-90, 2nd year nitrogen credit not taken.
- Theoretical total application to the crop 58-83-130 pounds per acre, not including any N credits, (2016 only)
- Theoretical crop removal in silage 140-65-145 pounds per acre (N requirement varies based upon soil and MRTN price ratio)

I. POTENTIALLY TRADEABLE PHOSPHORUS UNDER PROJECTED 2016-2017 MANAGEMENT (BASELINE) : SnapPlus Modeling version 17.1 was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model the fields under projected management practices. The current management: crops and nutrient applications were modeled out to 2023 and extended out to 2028 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The following Attachments were generated through the modeling process. Attachment C includes the following SnapPlus reports:

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

TABLE 1 – PTP Wayne Riethmiller Existing Conditions (Baseline)

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
Wayne Riethmiller	wayne 1	FLAMBEAU	FhB	20.4	230	182	236	185	270	210
Total				**20.4**	**230**	**182**	**236**	**185**	**270**	**210**

J. CREDIT GENERATION – CONVERSION TO PERENNIAL VEGETATION: After Water Quality Trading Plan WQT-2019-0006 was approved by the DNR and by the City of Greenwood, the farm installed or implemented the conservation practices listed in the following section. The City and Wayne Riethmiller entered into an agreement to maintain the conservation practices. The agricultural land will be used to generate Phosphorus Credits through reduction of tillage, installing perennial vegetation (hay), and no longer spreading manure in the winter. The perennial vegetation established as part of WQT-2019-0006 will remain for the following five year term.

1. **Nutrient Management.** Wayne 1, the field in this trade, tests high in Phosphorus and will be operated to draw down the Phosphorus level. This will be done by withholding nutrient applications and removing crops without replacing the Phosphorus. Phosphorus will be drawn down to the optimum level on the soil test, before Phosphorus containing fertilizers will be applied.
2. **Soil Sampling.** Soil sampling will be conducted on a 4 year schedule to monitor the nutrients. The soil tests will be used to prescribe the proper fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section and the sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to AgSource Laboratories. Fields with multiple composite samples will be averaged to make recommendations. For a detailed description of the sampling procedure refer to UW Extension A2100. **Soil samples were taken 11-4-2023 to monitor drawdown of Phosphorus from the soil in Field Wayne 1. The adjusted average is 16 PPM Phosphorus down from 39 PPM Phosphorus in 2018. Attachment Q**
3. **Cropping.** The field was seeded to alfalfa/grass with a nurse crop in May of 2018; 2019 to the termination of the contract the field will remain in grass hay.
4. **Tillage:** The field was prepared for planting by moldboard plowing with subsequent passes of a disc (2018). The field will not be tilled again for the term of the contract unless, to repair a greater erosion risk.
5. **Seeding:**
   - **Soil preparation.** The field was moldboard plowed to incorporate residue of the previous crop, and disked/cultivated to prepare a smooth seedbed.
   - **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

30%	Alfalfa
20%	Fawn Tall Forage Fescue
20%	Timothy
30%	Brome Grass

   - **Nurse Crop.** A nurse crop was seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment.
   - **Seed Placement.** Seed sown using grain drill / brillion type seeder.
   - **Harvest.** As appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

K. CREDIT ADJUSTMENT FOR PROPOSED ACTION: The remainder of the property containing field Wayne 1 has been in hay for an extended period (as indicated in CropScape since 2009) and will need to be reseeded. The farmer plans to reseed the remainder of the property in 5 acre increments, progressing to the west. To prepare the field for reseeding, each strip will be seeded to corn for a minimum of 1 year. Then seeded back into hay, therefore this process will negate a portion of the credit generated from field Wayne 1. SnapPlus was used to model one of these 5 acre strips, designated as field Wayne 2, to generate the Potentially Tradeable Phosphorus, which will then be deducted from the credit generated by field Wayne 1 on an annual basis. In summary the farm will be generating credit by reducing corn acres from 20± acres to only 15±.

1. **<u>SnapPlus - Modeling</u>:**
    - Previous 2 years grass hay
    - The field is modeled with a grassed filter strip to reduce the impact of reseeding. A buffer strip is maintained along West Eaton Rd and the first 30' of field Wayne 1. The filter strip along Wayne 1 will not be fully functioning in 2018, so 2018 was modeled with no buffer strip.
    - 2018: Corn silage was modeled as a worst case scenario. The field was moldboard plowed and disked to prepare a seedbed. Commercial fertilizer 200 lb. of 19-19-19 starter fertilizer was applied, consistent with past practice no additional nitrogen was applied.
    - 2019: Corn silage modeled as a worst case scenario. The field was chisel plowed and disked to prepare a seedbed. Commercial fertilizer 200 lb. of 19-19-19 starter fertilizer was applied, consistent with past practice, no additional nitrogen was applied.

    - 2020: The field was be seeded back down to hay with a nurse crop of oats. The field was moldboard plowed and disked to prepare a seedbed, and seeded with a drill or brillion.

    - 2022-2023, Alfalfa grass hay is established and harvested as hay.

      Note: 2024 and beyond the above system will be continued as needed to reseed 5 acres at a time.
    - See Attachment J for SnapPlus map and reports
        - Producers Plan report
        - P Trade Report
        - Map of modeled strip

TABLE 2 – 5 ac. RESEEDING

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
Wayne Riethmiller	wayne 2	FLAMBEAU	FhB	5.0	12	6	4	2	2	2
Total				**5**	**12**	**6**	**4**	**2**	**2**	**2**

2. **<u>Credit Deduction</u>:** The first strip was seeded back into hay in 2020 and the next strip seeded to corn in 2020 to continue the process. For the credit deduction we will add the deduction, for 2019 which would be 2nd year corn to year 2020 which is the seeding year for hay, by doing this we can simulate the transition year going from one strip to another. This will simulate 5 acres being seeded back into hay and the next strip being seeded to corn.
3. **<u>Credit Deduction Schedule</u>:**
    - 2018, 12 lb.
    - 2019 (2024), 6 lb. + 4 lb. =10 lb. to simulate reseeding the strip back into hay early.
    - 2020 (2025), 6 lb. +4 lb.=10 lb. the planned year to seed the first strip back to hay and rotate the next strip to corn.
    - 2021 (2026), 6 lb. +4 lb. =10 lb. to simulate reseeding the strip back into hay early.
    - 2022 (2027), 6 lb. +4 lb. =10 lb. the planned year to seed the 2nd strip back to hay and rotate the next strip to corn.
    - 2023 (2028), 6 lb. +4 lb. =10 lb. to simulate reseeding the strip back into hay early.

L. POTENTIALLY TRADEABLE PHOSPHORUS: Will be generated through a Conservation Easement which generates credit though a reduction of tillage and perennial vegetation (hay), which provides year round ground cover and phosphorus trapping abilities. The other practice that will generate PTP credit will be to no longer spread manure in the winter. The farm sold its dairy herd so the need to spread manure daily is has been removed. The following SnapPlus reports will be included in Attachment E to document the proposed operating conditions of field Wayne 1.

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorus Trade Report

TABLE 3 – PTP Perennial Vegetation

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
wayne riethmiller	wayne 1	FLAMBEAU	FhB	20.4	110	11	10	7	5	4
Total				**20.4**	**110**	**11**	**10**	**7**	**5**	**4**

M. PHOSPHORUS TRADE RATIOS: The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratio. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices. Following are the trade ratio factors:

- **Delivery -** N/A Credit generator and user within same HUC 12
- **Downstream –** 1.1:1 The runoff from this field discharges into the Black River approximately 2600' downstream of the WWTF Outfall, via an intermittent stream See Attachment F
- **Equivalency -** N/A for Phosphorus
- **Uncertainty –** Conservation Easement, perennial vegetation for the term of the contract. 1:1 per. Appendix H Guidance for Implementing Water Quality Trading in WPDES Permits, 6/1/2020, Edition 2
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Wayne Riethmiller and the City of Greenwood WWTF**.

N. REPORTING:

(REFER TO ATTACHMENT I – OPERATION MAINTENANCE AND INSPECTION PLAN)

O. PHOSPHORUS CREDIT GENERATION: Credits are calculated as the difference between phosphorus lost under a baseline condition and phosphorus lost under practices installed/implemented to reduce phosphorus runoff. The credits were calculated on an annual basis. The table below shows the trade rates per year beginning in 2018 and extending to 2028. WQT Plan #2 is a continuation of perennial vegetation in field wayne 1. Phosphorus credits in years 2019-2023 will be used for years 2024-2028, i.e. 2019 will be the same as 2024 and so on, for WQT Plan #2.

TABLE 4: TRADEABLE PHOSPHORUS

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
Past Practices PTP	wayne 1	FLAMBEAU	FhB	20.4	230	182	236	185	270	210
Perennial Vegetation PTP	wayne 1	FLAMBEAU	FhB	20.4	110	11	10	7	5	4
					120	171	226	178	265	206
PTP Credit Deduction From Reseeding	wayne 2	FLAMBEAU	FhB	5.0	12	10	10	10	10	10
Total PTP				**20.4**	**108**	**161**	**216**	**168**	**255**	**196**
Total Credits w/1.2:1 trade ratio				**20.4**	**90**	**134**	**180**	**140**	**212**	**163**

P. MANAGEMENT PRACTICE REGISTRATION: Submit the following to the DNR to register that the management practices have been installed:

- Date of contract; *The Water Quality Trading Agreement between Wayne Riethmiller and the City of Greenwood was signed 8-12-2019 and extends through next WPDES permit term of 7-01-2024 to 6-30-2029*
- Management Practice Registration form *Attachment G*
- Date corrective measures have been completed *(none)*
- Date of seeding filter strips *(Spring 2018)*
- Date of 90% ground cover and photo verification *(11-4-2019 See 2019 inspection, Attachment P)*
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season. *See 2019 inspection for description of seeding year failure, and photo verification of corrected condition.*

1. **<u>Monthly Reporting</u>:** Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**
2. **<u>Annual Reporting</u>**: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:
   - Verification that site inspection has occurred
   - Brief summary of site inspection findings
   - Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
   - At least 1 photo of the perennial vegetation, indicating condition
   - A summary of credits used each month over the calendar year

3. **Notification of Problems That Affect Credit Generation:** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT plan. The City will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

Q. DNR RIGHT OF ENTRY: Wayne Riethmiller grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

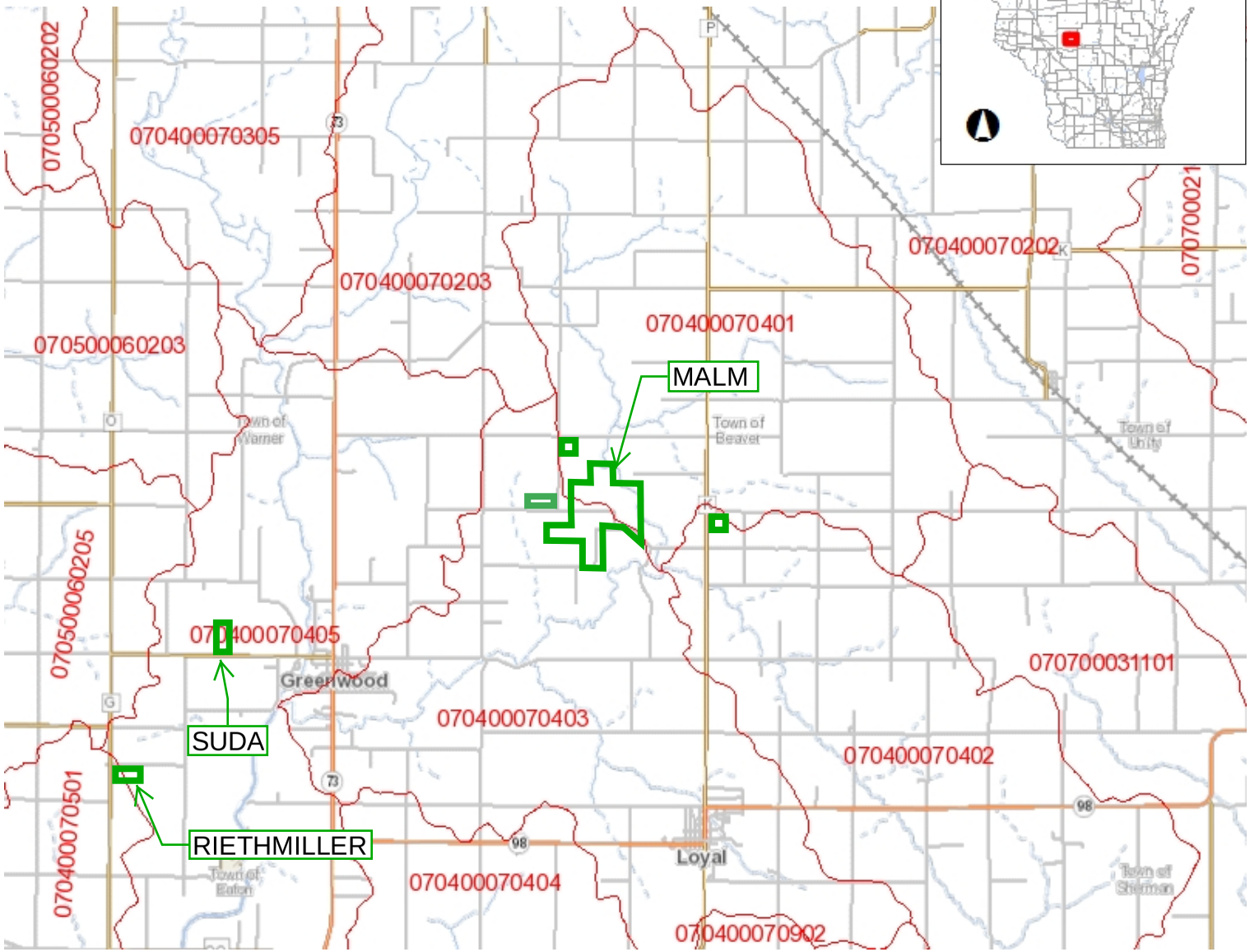
R. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST

This WQT Plan complies with the required content of a WQT Plan as outlined on Table 5, page 45 of Guidance for Implementing Water Quality Trading in WPDES Permits, Guidance No: 3800-2020-01; Form 3400-208 is included as Attachment K. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit".

Below are listed the checklist questions, **bold and underlined**, with the answers following.

• **Permittee's/credit user's WPDES permit number**:	No. WI 020249-10-0
• **Permittee's/credit users contact information:**	Kayla Schar, City Clerk 201 S. Main Street Greenwood WI 54437 Phone 715-267-6205
• **Pollutant for which credit will be generated:**	Phosphorus
• **Amount of Credits available from each location, management practice, local government unit when acting as broker:**	See Table 4, page 7
• **Certification that the content of the trading application is accurate and correct**.	See Attachment L
• **Signature and date of signature of permittee's/ credit users authorized representative:**	See Attachment L
• **Location where credits will be generated:**	See Attachment A and B
• **Identification of methods including management practices that will be used to generate credits:**	See Section J, page 3
• **Duration of agreement with each credit generator:**	5 years with the provision of extension, unless WPDES removes the phosphorus requirement
• **Schedule for installation/construction of each management practice:**	See Section J-3, page 4
• **Operation and Maintenance plan for each management practice**,	See Attachment I
• **Date when credits become available for each management practice:**	See Section O, page 7
• **Models used to derive the amount of credits:**	SnapPlus, see Attachment C & E
• **The applicable trade ratio for each management practice including supporting technical basis:**	See section M, page 6

Greenwood and Adjacent HUC 12's



Legend

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

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

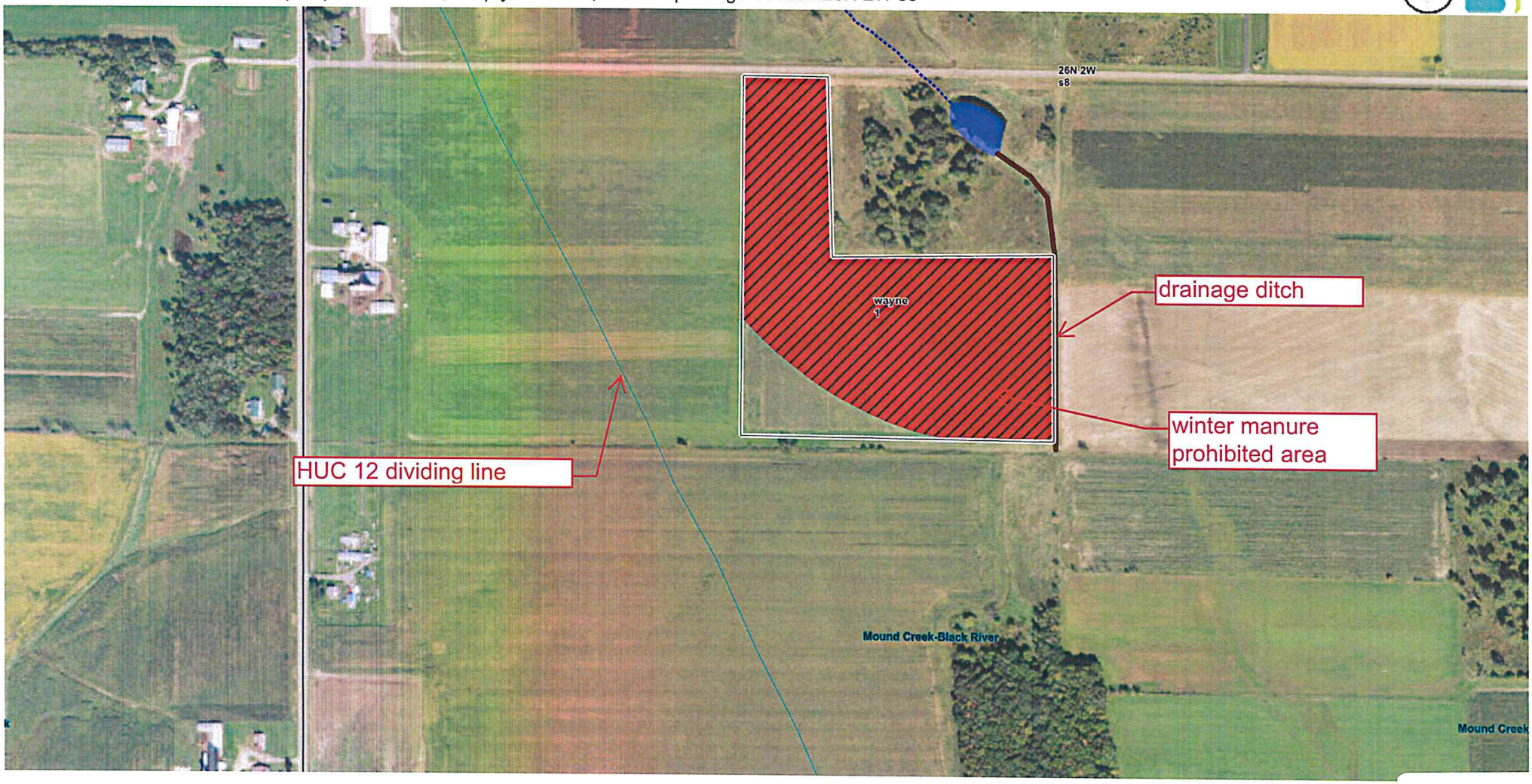
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

Notes

ATTACHMENT A

Attachment B

Map Generated on:8/1/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s8



- Feb/Mar liquid manure prohibited areas
- Perennial Streams
- Intermittent Streams
- Waterbodies
- HUC 12 Watershed
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Winter manure prohibited areas
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

RIETHMILLER
ATTACHMENT B

NM1: Narrative and Crops Report

Starting Year	**2016**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Farm has 1 fields totalling 20.4 acres
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Acres	2016	2017	2018	2019	2020	2021	2022	2023
wayne 1	20.4	Corn silage Spring MB Plow 10-15	Corn silage Spring Chisel, disked 10-15	Corn silage Spring MB Plow 10-15	Corn silage Spring Chisel, disked 10-15	Corn silage Spring MB Plow 10-15	Corn silage Spring Chisel, disked 10-15	Corn silage Spring MB Plow 10-15	Corn silage Spring Chisel, disked 10-15

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

Crops Grouped By Category		2016	2017	2018	2019	2020	2021	2022	2023
Corn silage	Acres	20 250	20 250	20 250	20 250	20 250	20 250	20 250	20 250

FM6: Soil Test Report

Reported For	Wayne Riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
wayne 1		20.4	FhB	FLAMBEAU	2018-04-30	Soil & Forage Analysis Lab	2075	**4**	**5**	6.6	3.2	39	89	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2018	2019	2020	2021	2022	2023
wayne 1	2018-04-30					X	

FM2: Application Summary Report

Starting Year	**2016**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Annual Manure Production And Use By Source

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

Source		2016	2017	2018	2019	2020	2021	2022
Dairy Liquid	Production (Gallons)	0	0	0	0	0	0	0
	Used (Gallons)	0	0	0	0	0	0	0
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11
	Dry Matter (%)	2	2	2	2	2	2	2
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Solid	Production (Tons)	0	0	0	0	0	0	0
	Used (Tons)	306	306	306	306	306	306	306
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33	33	33	33	33
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Application Results Reported For Farm All

Source		2023
Dairy Liquid	Production (Gallons)	0
	Used (Gallons)	0
	Analysis Date	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11
	Dry Matter (%)	2
	Total Value	0.00
Dairy Solid	Production (Tons)	0
	Used (Tons)	306
	Analysis Date	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6
	Dry Matter (%)	33
	Total Value	0.00

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2016	2017	2018	2019	2020	2021	2022
Produced from Manure (lb)	Ninj	0	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0	0
	K2O	0	0	0	0	0	0	0
Total Available Manure Nutrients Applied (lb)	Ninj	918	918	918	918	918	918	918
	P2O5	918	918	918	918	918	918	918
	K2O	1,836	1,836	1,836	1,836	1,836	1,836	1,836
Total Fertilizer Nutrients Applied (lb)	N	775	0	775	0	775	0	775
	P2O5	775	0	775	0	775	0	775
	K2O	816	0	816	0	816	0	816
Total Crop Removal (lb)	P2O5	918	918	918	918	918	918	918
	K2O	2,142	2,142	2,142	2,142	2,142	2,142	2,142
Nutrient Balance (Applied - Crop removal, lb)	P2O5	775	0	775	0	775	0	775
	K2O	510	-306	510	-306	510	-306	510

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2023
Produced from Manure (lb)	Ninj	0
	P2O5	0
	K2O	0
Total Available Manure Nutrients Applied (lb)	Ninj	918
	P2O5	918
	K2O	1,836
Total Fertilizer Nutrients Applied (lb)	N	775
	P2O5	775
	K2O	816
Total Crop Removal (lb)	P2O5	918
	K2O	2,142
Nutrient Balance (Applied - Crop removal, lb)	P2O5	775
	K2O	510

NM4: Manure Tracking Report

Starting Year	**2016**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Acres/ CropYear	2016	2017	2018
Acres in plan	20.4	20.4	20.4
Acres receiving manure	20.4	20.4	20.4

Annual Manure Production And Use By Source

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

Source		2016	2017	2018
Dairy Liquid	Production (Gallons)	0	0	0
	Used (Gallons)	0	0	0
	Analysis Date	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11
	Dry Matter (%)	2	2	2
	Total Value	0.00	0.00	0.00
Dairy Solid	Production (Tons)	0	0	0
	Used (Tons)	306	306	306
	Analysis Date	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33
	Total Value	0.00	0.00	0.00

Estimated Livestock Manure Production For 2018

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Dairy Lactating Cows 1400 lbs		wayne	25	365	100	0	675	0
Dairy Calf 250 lbs		wayne	5	365	100	0	19	0
Dairy Youngstock 500 lbs		wayne	5	365	100	0	38	0
Dairy Heifer 1000 lbs		wayne	15	365	75	0	168	0
Dairy Dry Cows 1400 lbs		wayne	5	365	75	0	79	0
						Farm Totals	979	0

Manure Storage For 2018

No Storages Found

Spreaders For 2018

No Spreaders Found

NM3: Field Data and 590 Assessment Plan

Reported For	Wayne Riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20 Total Acres Reported.

Field Name	Sub Farm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	N/Fld Res	Contour/ Filters	Irrig	Tiled	Rotation	Tillage	Report Period	Field "T" t/ac	Rot Avg Soil Loss t/ac	SCI	Rot Avg Pl	Soil Test P ppm	Rot P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
wayne 1				20.4	Clark	FLAMBEAU FhB	4	350	0 - 2	301 - 1000	W	No / No	No	No	Csl	SP	2016-2016	5	7.4	-0.3	12	39	38	-

Crop Abbreviations

Abbreviation	Crop
Csl	Corn silage

Tillage Abbreviations

Abbreviation	Tillage
SP	Spring MB Plow

Restriction Legend

Code	Description of Code
S	Field is in SWQMA
D	Drinking water well within 50 feet of field.
C	Conduit to groundwater within 300 feet
L	Local restrictions on nutrient applications.
%	Slope restriction for winter applications
P	High permeability N restricted soils
R	N restricted soils with less than 20 inches to bedrock
W	N restricted soils with less than 12 inches to apparent water table
+	This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present.

FM3: Producer's Plan Report

Crop Year	**2016**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2015 Crop and Tillage	2016 Crop and Tillage	Adjusted Crop Need lb/ac	2016 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	missing	Corn silage Spring MB Plow	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Subsurface	4,200 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2017**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2016 Crop and Tillage	2017 Crop and Tillage	Adjusted Crop Need lb/ac	2017 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-160	0	0	30-45-90	30-45-90	0-45-0	160-0-70	19-19-20 (19-19-20) 19-19-20	0 lb	Spring Unincorp	
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2018**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2017 Crop and Tillage	2018 Crop and Tillage	Adjusted Crop Need lb/ac	2018 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring Chisel, disked	Corn silage Spring MB Plow	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Subsurface	4,080 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2019**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2018 Crop and Tillage	2019 Crop and Tillage	Adjusted Crop Need lb/ac	2019 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-160	0	0	30-45-90	30-45-90	0-45-0	160-0-70	19-19-20 (19-19-20) 19-19-20	0 lb	Spring Subsurface	
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2020**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2019 Crop and Tillage	2020 Crop and Tillage	Adjusted Crop Need lb/ac	2020 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring Chisel, disked	Corn silage Spring MB Plow	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Subsurface	4,080 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2021**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2020 Crop and Tillage	2021 Crop and Tillage	Adjusted Crop Need lb/ac	2021 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-160	0	0	30-45-90	30-45-90	0-45-0	160-0-70	Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2022**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2021 Crop and Tillage	2022 Crop and Tillage	Adjusted Crop Need lb/ac	2022 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring Chisel, disked	Corn silage Spring MB Plow	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Unincorp	4,080 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2023**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2022 Crop and Tillage	2023 Crop and Tillage	Adjusted Crop Need lb/ac	2023 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Unincorp	4,080 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

WQ1: P Trade Report

Reported For	Wayne Riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24
SnapPlus Version 17.1 built on 2018-05-25	
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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

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

Questions? Please contact DNRphosphorus@wisconsin.gov

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

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

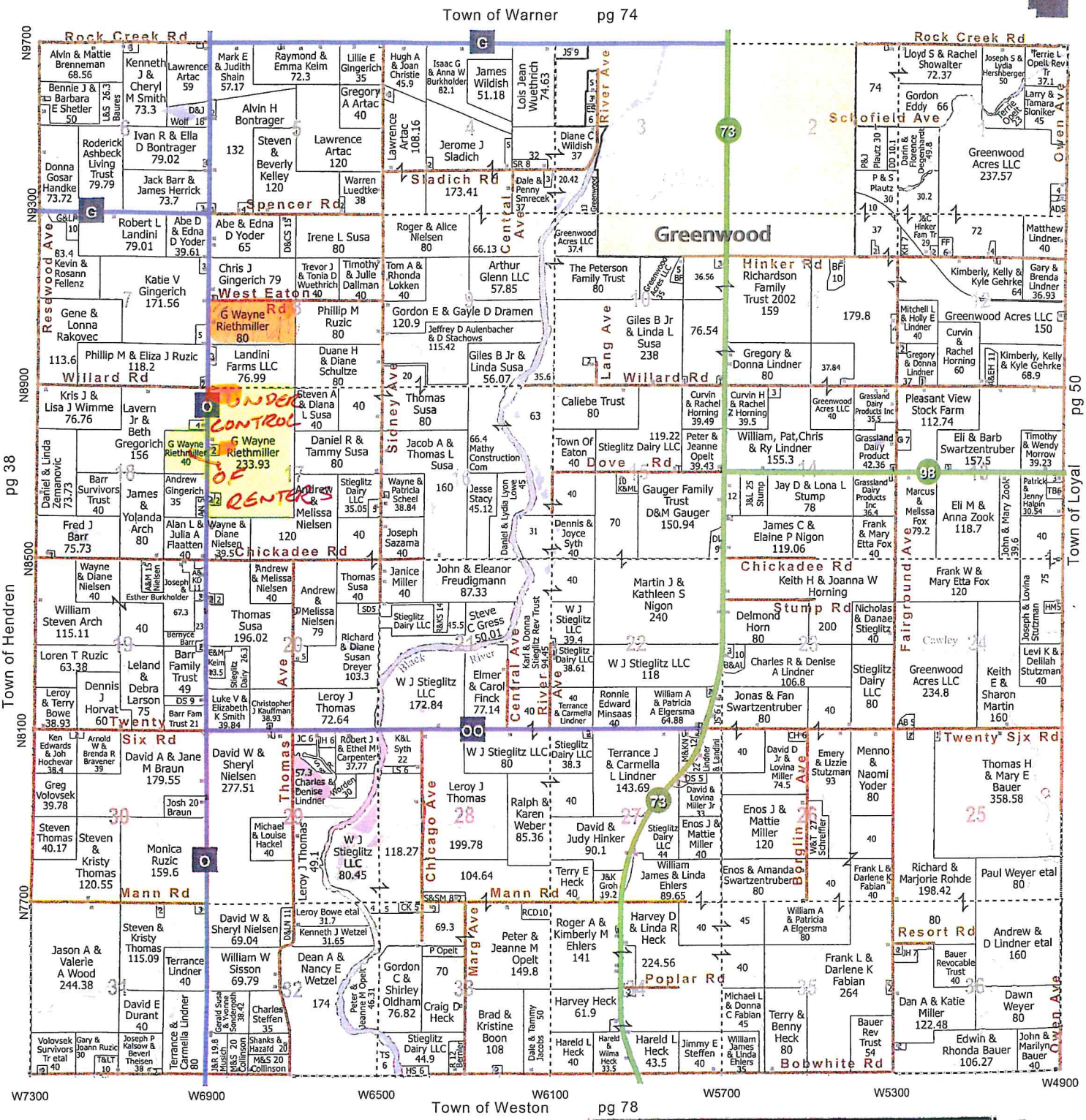
P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022	2023
wayne 1	FLAMBEAU	FhB	20	230	182	236	185	270	210
Total			**20**	**230**	**182**	**236**	**185**	**270**	**210**

RIETHMILLER

ATTACHMENT D

TOWN OF EATON

T26N R2W



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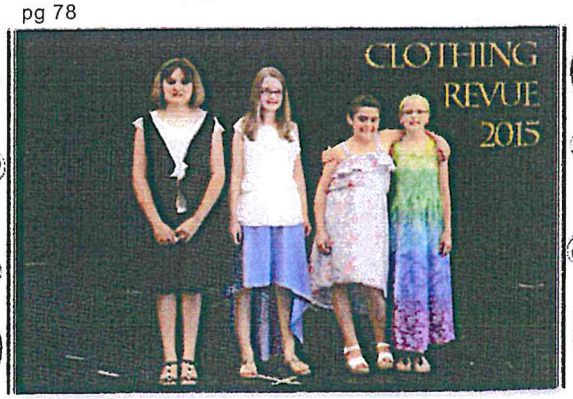

RIETHMILLER
ATTACHMENT E

NM1: Narrative and Crops Report

Starting Year	**2016**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Farm has 1 fields totalling 20.4 acres
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Acres	2016	2017	2018	2019	2020	2021	2022	2023
wayne 1	20.4	Corn silage Spring MB Plow 10-15	Corn silage Spring Chisel, disked 10-15	Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow 30-60	Alfalfa/Brome None 2.6-3.5	Alfalfa/Brome None 2.6-3.5	Alfalfa/Brome None 2.6-3.5	Alfalfa/Brome None 2.6-3.5	Alfalfa/Brome None 2.6-3.5

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

Crops Grouped By Category		2016	2017	2018	2019	2020	2021	2022	2023
Alfalfa/Brome	Acres				20 61	20 61	20 61	20 61	20 61
Corn silage	Acres	20 250	20 250						

Crops Grouped By Category		2016	2017	2018	2019	2020	2021	2022	2023
Oats w/ Alfalfa/Brome Seeding Spring	Acres			20 900					

FM6: Soil Test Report

Reported For	wayne riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
wayne 1		20.4	FhB	FLAMBEAU	2018-04-30	Soil & Forage Analysis Lab	2075	**4**	**5**	6.6	3.2	39	89	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2018	2019	2020	2021	2022	2023
wayne 1	2018-04-30					X	

FM2: Application Summary Report

Starting Year	**2016**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Annual Manure Production And Use By Source

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

Source		2016	2017	2018	2019	2020	2021	2022
Dairy Liquid	Production (Gallons)	0	0	0	0	0	0	0
	Used (Gallons)	0	0	0	0	0	0	0
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11
	Dry Matter (%)	2	2	2	2	2	2	2
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Solid	Production (Tons)	0	0	0	0	0	0	0
	Used (Tons)	306	306	306	0	0	0	0
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33	33	33	33	33
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Application Results Reported For Farm All

Source		2023
Dairy Liquid	Production (Gallons)	0
	Used (Gallons)	0
	Analysis Date	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11
	Dry Matter (%)	2
	Total Value	0.00
Dairy Solid	Production (Tons)	0
	Used (Tons)	0
	Analysis Date	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6
	Dry Matter (%)	33
	Total Value	0.00

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2016	2017	2018	2019	2020	2021	2022
Produced from Manure (lb)	Ninj	0	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0	0
	K2O	0	0	0	0	0	0	0
Total Available Manure Nutrients Applied (lb)	Ninj	918	918	918	0	0	0	0
	P2O5	918	918	918	0	0	0	0
	K2O	1,836	1,836	1,836	0	0	0	0
Total Fertilizer Nutrients Applied (lb)	N	775	0	0	0	0	0	0
	P2O5	775	0	0	0	0	0	0
	K2O	816	0	0	2,489	2,489	2,489	2,489
Total Crop Removal (lb)	P2O5	918	918	1,122	816	816	816	816
	K2O	2,142	2,142	4,284	3,672	3,672	3,672	3,672
Nutrient Balance (Applied - Crop removal, lb)	P2O5	775	0	-204	-816	-816	-816	-816
	K2O	510	-306	-2,448	-1,183	-1,183	-1,183	-1,183

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2023
Produced from Manure (lb)	Ninj	0
	P2O5	0
	K2O	0
Total Available Manure Nutrients Applied (lb)	Ninj	0
	P2O5	0
	K2O	0
Total Fertilizer Nutrients Applied (lb)	N	0
	P2O5	0
	K2O	2,489
Total Crop Removal (lb)	P2O5	816
	K2O	3,672
Nutrient Balance (Applied - Crop removal, lb)	P2O5	-816
	K2O	-1,183

NM4: Manure Tracking Report

Starting Year	**2016**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date:	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Acres/ CropYear	2016	2017	2018	2019	2020	2021	2022	2023
Acres in plan	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Acres receiving manure	20.4	20.4	20.4	0.0	0.0	0.0	0.0	0.0

Annual Manure Production And Use By Source

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

Source		2016	2017	2018	2019	2020	2021	2022	2023
Dairy Liquid	Production (Gallons)	0	0	0	0	0	0	0	0
	Used (Gallons)	0	0	0	0	0	0	0	0
	Analysis Date	-	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11	4/6/7-3-11
	Dry Matter (%)	2	2	2	2	2	2	2	2
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Solid	Production (Tons)	0	0	0	0	0	0	0	0
	Used (Tons)	306	306	306	0	0	0	0	0
	Analysis Date	-	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6	2/3/3-3-6
	Dry Matter (%)	33	33	33	33	33	33	33	33
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Estimated Livestock Manure Production For 2018

Animal Type	Subfarm	Barn	# of Animals	Total No. Of Days	% Collected As Solid	% Collected As Liquid	Yearly Tons	Yearly Gallons
Dairy Lactating Cows 1400 lbs		wayne	25	365	100	0	675	0
Dairy Calf 250 lbs		wayne	5	365	100	0	19	0
Dairy Youngstock 500 lbs		wayne	5	365	100	0	38	0
Dairy Heifer 1000 lbs		wayne	15	365	75	0	168	0
Dairy Dry Cows 1400 lbs		wayne	5	365	75	0	79	0
						Farm Totals	979	0

Manure Storage For 2018

No Storages Found

Spreaders For 2018

No Spreaders Found

NM3: Field Data and 590 Assessment Plan

Reported For	wayne riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20 Total Acres Reported.

Field Name	Sub Farm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	N/Fld Res	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 P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
wayne 1				20.4	Clark	FLAMBEAU FhB	4	350	0 - 2	301 - 1000	W	No / No	No	No	OgABs-AB-AB-AB-AB-AB	SP-None-None-None-None-None	2018-2023	**5**	**0.2**	**1.1**	**1**	39	-210	-

Crop Abbreviations

Abbreviation	Crop
AB	Alfalfa/Brome
OgABs	Oats w/ Alfalfa/Brome Seeding Spring

Tillage Abbreviations

Abbreviation	Tillage
None	None
SP	Spring MB Plow

Restriction Legend

Code	Description of Code
S	Field is in SWQMA
D	Drinking water well within 50 feet of field.
C	Conduit to groundwater within 300 feet
L	Local restrictions on nutrient applications.
%	Slope restriction for winter applications
P	High permeability N restricted soils
R	N restricted soils with less than 20 inches to bedrock
W	N restricted soils with less than 12 inches to apparent water table
+	This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present.

FM3: Producer's Plan Report

Crop Year	**2016**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2015 Crop and Tillage	2016 Crop and Tillage	Adjusted Crop Need lb/ac	2016 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	missing	Corn silage Spring MB Plow	190-0-160	0	0	68-83-130	68-83-130	0-83-0	122-0-30	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Subsurface	4,080 lb
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2017**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

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Prepared for:
wayne riethmiller
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Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2016 Crop and Tillage	2017 Crop and Tillage	Adjusted Crop Need lb/ac	2017 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-160	0	0	30-45-90	30-45-90	0-45-0	160-0-70	19-19-20 (19-19-20) 19-19-20	0 lb	Spring Unincorp	
											Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2018**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2017 Crop and Tillage	2018 Crop and Tillage	Adjusted Crop Need lb/ac	2018 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Corn silage Spring Chisel, disked	Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow	20-0-310	0	0	30-45-90	30-45-90	10-45-0	0-0-220	Dairy Solid 2-3-6	15 ton	Winter Unincorp	306 ton

FM3: Producer's Plan Report

Crop Year	**2019**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2018 Crop and Tillage	2019 Crop and Tillage	Adjusted Crop Need lb/ac	2019 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow	Alfalfa/Brome None	0-0-235	0	0	0-0-122	0-0-122	0-0-0	0-0-113	Potassium chloride 0-0-61	200 lb	Spring Unincorp	4,080 lb

FM3: Producer's Plan Report

Crop Year	**2020**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
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Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2019 Crop and Tillage	2020 Crop and Tillage	Adjusted Crop Need lb/ac	2020 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Alfalfa/Brome None	Alfalfa/Brome None	0-0-235	0	0	0-0-122	0-0-122	0-0-0	0-0-113	Potassium chloride 0-0-61	200 lb	Summer Unincorp	4,080 lb

FM3: Producer's Plan Report

Crop Year	**2021**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

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Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2020 Crop and Tillage	2021 Crop and Tillage	Adjusted Crop Need lb/ac	2021 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Alfalfa/Brome None	Alfalfa/Brome None	0-0-235	0	0	0-0-122	0-0-122	0-0-0	0-0-113	Potassium chloride 0-0-61	200 lb	Summer Unincorp	4,080 lb

FM3: Producer's Plan Report

Crop Year	**2022**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb

Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2021 Crop and Tillage	2022 Crop and Tillage	Adjusted Crop Need lb/ac	2022 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Alfalfa/Brome None	Alfalfa/Brome None	0-0-235	0	0	0-0-122	0-0-122	0-0-0	0-0-113	Potassium chloride 0-0-61	200 lb	Summer Incorp	4,080 lb

FM3: Producer's Plan Report

Crop Year	**2023**
Reported For	**wayne riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb

Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

Field Data: 20.4 Total Acres Reported.

Field Name	Ac.	2022 Crop and Tillage	2023 Crop and Tillage	Adjusted Crop Need lb/ac	2023 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 1	20.4	Alfalfa/Brome None	Alfalfa/Brome None	0-0-235	0	0	0-0-122	0-0-122	0-0-0	0-0-113	Potassium chloride 0-0-61	200 lb	Summer Unincorp	4,080 lb

WQ1: P Trade Report

Reported For	wayne riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24
SnapPlus Version 17.1 built on 2018-05-25	
M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb	

Prepared for:
wayne riethmiller
attn:Wayne Reithmiller

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

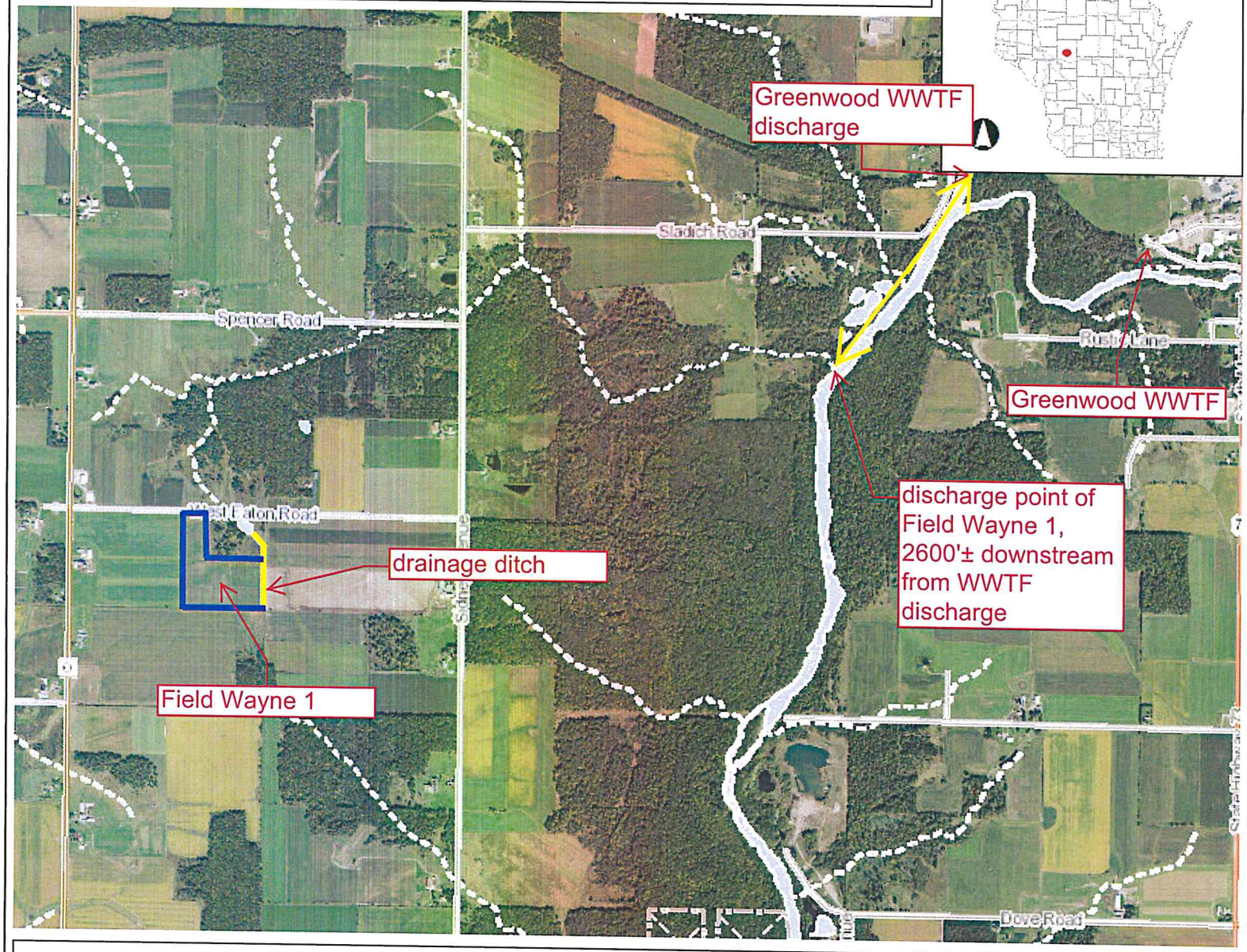
Questions? Please contact DNRphosphorus@wisconsin.gov

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

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

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022	2023
wayne 1	FLAMBEAU	FhB	20	110	11	10	7	5	4
Total			**20**	**110**	**11**	**10**	**7**	**5**	**4**

Attachment F



Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

Notes

0.8 0 0.38 0.8 Miles

NAD_1983_HARN_Wisconsin_TM

1: 23,760

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

RIETHMILLER

ATTACHMENT G

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
City of Greenwood	WI- 020249-09	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Lonna Klinke	102 N. Main Street	Greenwood	WI	54437

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 ◉ Agricultural NPS ○ Other		Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips	1,000	1.2:1	Snap plus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Clark	Black River	see attached maps	Phosphorous

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
Amy Lotham	8-6-18

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
Lonna Klinke	8-6-18

Leave Blank -- For Department Use Only

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

RIETHMILLER
ATTACHMENT H

Larry Gotham

To: Ezra Gotham (egotham@centurytel.net)
Subject: FW: Greenwood WQT

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

From: Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
Sent: Tuesday, September 12, 2017 8:53 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
Subject: RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

From: Fassbender, Lori - DNR
Sent: Monday, September 11, 2017 4:55 PM
To: Larry Gotham <lgotham@centurytel.net>
Cc: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Subject: RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

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

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

From: Larry Gotham [mailto:lgotham@centurytel.net]
Sent: Friday, March 31, 2017 10:22 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
Subject: Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

Larry Gotham

From: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Sent: Friday, February 02, 2018 9:17 AM
To: Larry Gotham; Fassbender, Lori - DNR
Cc: Ezra Gotham; Hartenbower, Benjamin P - DNR
Subject: RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

From: Larry Gotham [mailto:lgotham@centurytel.net]
Sent: Thursday, February 01, 2018 2:05 PM
To: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
Cc: Ezra Gotham <egotham@centurytel.net>
Subject: RE: Greenwood WQT

Hi Pat:
Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.

Larry Gotham, P.E., R.L.S.

Operation, Maintenance & inspection Plan
Field Wayne 1, Wayne Riethmiller Farm
For Water Quality Trading
City of Greenwood

The goal of the operation and maintenance plan is to ensure that the perennial grass cover will persist. The primary purpose of the grass cover is to reduce the phosphorus and sediments that leave the farm and degrade water quality on the Black River. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop.

Section 1 - Seeding Year 2018

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** will either be as oatlage or as grain and straw. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6" or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6" or after September 1st.

E. **Inspection Frequency** shall be **monthly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

Section 2 - 2019 and beyond

1. **Weed Management**,
    - Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
    - Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edge. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for soil erosion.
2. **Erosion control**. It is unlikely that there will be erosion issues or gully formation after the first year; the site has no highly erodible lands and no evidence of valleys or gullies in the fields. If erosion becomes evident with monthly inspections, it will be repaired as listed below:
    - Erosion will be filled by tillage or by importing topsoil
    - The area will be seeded with the original grass mix as listed in the water quality trading plan.
    - Erosion mat will be applied to the reseeded area.
    - American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.
3. **Harvesting**. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand.
    - The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
    - Frequency of the cutting will be dictated by the forage quality required.
    - The field should not be harvested after September 1st to allow for winter ground cover.
4. **Nutrient Management.** The field will be operated to draw down the high phosphorus level as based upon UW soil tests. This will be done by removing the grass hay crop without replacing Phosphorous. The nutrients will be drawn down to the optimum level on the soil test, at which point in time fertilizer can be applied to maintain the optimum level on the soil test. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the optimum level.
5. **Soil Sampling.** Soil sampling will be completed on a 4 year schedule to monitor the nutrients and maintain them at a level no higher than the optimum range. The soil tests will be used to prescribe the correct fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section. The sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW Soil & Forage Analysis Lab in Medford. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension Bulletin A2809.
6. **Inspection** is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be monthly during the growing season. The following inspection and reporting procedure shall be used:
    - **Monthly Reporting (<u>seeding year</u>) -** Each month the Soil Conservationist or Engineer shall file the report with the Clerk assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained. This monthly update will also be used to record the following:
        - Harvest dates

    - Approximate hay yields to determine nutrient removal rate
- **Quarterly Reporting (<u>second year</u>)** Quarterly reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>third year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer, and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Notification of Problems with Permanent Grass Cover -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

WATER QUALITY TRADING INSPECTION FORM
FOR THE CITY OF GREENWOOD
LOCATION: THE NE 1/4 - SW ¼, SECTION 8, T.26N. – R.2W.

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual

Practice compliance (check appropriate box)

Seeding year ☐

Photo taken ☐

Established perennial hay crop ☐

Filter strip ☐

Summary of findings:

_____

_____

_____

_____

_____

Identification of Items of non-compliance:

_____

_____

_____

Corrective measures required:

_____

_____

_____

Notice of **non-compliance** to the DNR required: Yes: _____ No: _____

Phosphorus credits used by City (annual report only): _____

Phosphorus credits available (annual report only): _____

Phosphorus credits deductions for failed practice

Field #	Failed practice & reason	Credit Deduction

FIELD # WHERE PHOTO WAS TAKEN	# OF PHOTOS TAKEN	GENERAL CONDITION OF FIELD

WQ1: P Trade Report

Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field no filter strip - Copy.snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

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

Questions? Please contact DNRphosphorus@wisconsin.gov

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

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

P Trade Report				PTP
Field Name	Soil Series	Soil Symbol	Acres	2018
wayne 2	FLAMBEAU	FhB	5	12
Total			**5**	**12**

RIETHMILLER
ATTACHMENT J

WQ1: P Trade Report

Reported For	Wayne Riethmiller
Printed	2018-08-01
Plan Completion/Update Date	2018-05-24
SnapPlus Version 17.1 built on 2018-05-25	
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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

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

Questions? Please contact DNRphosphorus@wisconsin.gov

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

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

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2019	2020	2021	2022	2023
wayne 2	FLAMBEAU	FhB	5	6	4	2	2	2
Total			**5**	**6**	**4**	**2**	**2**	**2**

FM3: Producer's Plan Report

Crop Year	**2018**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2017 Crop and Tillage	2018 Crop and Tillage	Adjusted Crop Need lb/ac	2018 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Grass hay None	Corn silage Spring MB Plow	190-0-105	0	0	38-38-40	38-38-40	0-38-0	152-0-65	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Unincorp	1,000 lb

FM3: Producer's Plan Report

Crop Year	**2019**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2018 Crop and Tillage	2019 Crop and Tillage	Adjusted Crop Need lb/ac	2019 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Corn silage Spring MB Plow	Corn silage Spring Chisel, disked	190-0-105	0	0	38-38-40	38-38-40	0-38-0	152-0-65	19-19-20 (19-19-20) 19-19-20	200 lb	Spring Subsurface	1,000 lb

FM3: Producer's Plan Report

Crop Year	**2020**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2019 Crop and Tillage	2020 Crop and Tillage	Adjusted Crop Need lb/ac	2020 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Corn silage Spring Chisel, disked	Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow	20-0-210	0	0	0-0-122	0-0-122	0-0-0	20-0-88	Potassium chloride 0-0-61	200 lb	Spring Unincorp	1,000 lb

FM3: Producer's Plan Report

Crop Year	**2021**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2020 Crop and Tillage	2021 Crop and Tillage	Adjusted Crop Need lb/ac	2021 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow	Alfalfa/Brome None	0-0-180	0	0	0-0-122	0-0-122	0-0-0	0-0-58	Potassium chloride 0-0-61	200 lb	Spring Unincorp	1,000 lb

FM3: Producer's Plan Report

Crop Year	**2022**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2021 Crop and Tillage	2022 Crop and Tillage	Adjusted Crop Need lb/ac	2022 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Alfalfa/Brome None	Alfalfa/Brome None	0-0-180	0	0	0-0-122	0-0-122	0-0-0	0-0-58	Potassium chloride 0-0-61	200 lb	Spring Unincorp	1,000 lb

FM3: Producer's Plan Report

Crop Year	**2023**
Reported For	**Wayne Riethmiller**
Printed	**2018-08-01**
Plan Completion/Update Date	**2018-05-24**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

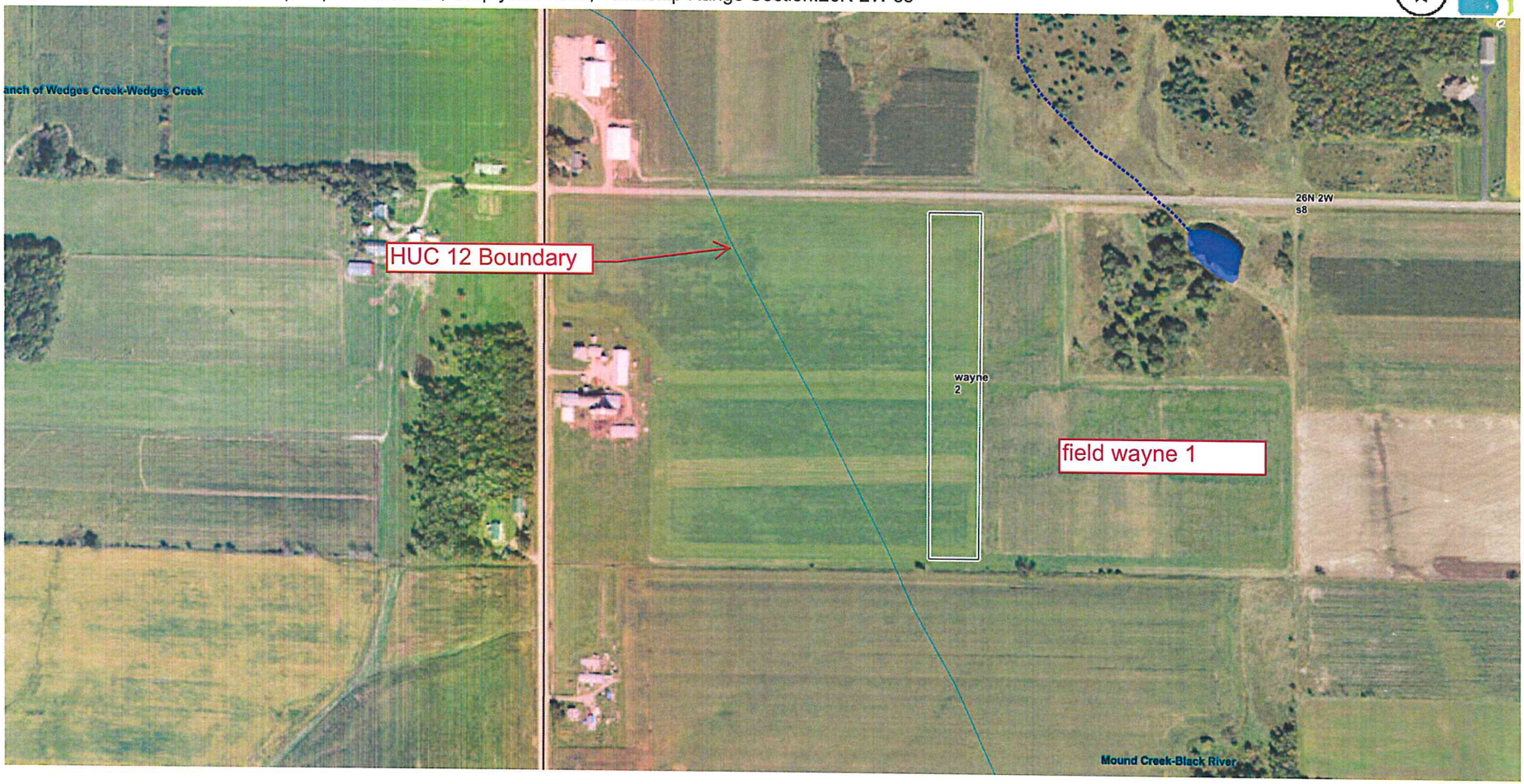
Prepared for:
Wayne Riethmiller
attn:Wayne Reithmiller

Field Data: 5 Total Acres Reported.

Field Name	Ac.	2022 Crop and Tillage	2023 Crop and Tillage	Adjusted Crop Need lb/ac	2023 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
wayne 2	5	Alfalfa/Brome None	Alfalfa/Brome None	0-0-180	0	0	0-0-122	0-0-122	0-0-0	0-0-58	Potassium chloride 0-0-61	200 lb	Spring Unincorp	1,000 lb

Attachment J

Map Generated on:8/1/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s8



- Intermittent Streams
- Waterbodies
- HUC 12 Watershed
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

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
City of Greenwood	WI- 020249-10	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Kayla Schar	201 S. Main Street	Greenwood	WI	54437

Project Name

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Black River	Phosphorus	070400070405

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: See Attachment A
- ○ 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				

Water Quality Trading Checklist

Form 3400-208 (1/14)

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	Perennial Vegetation "Conservation easement"	Snap-plus	not assigned	◉ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part

Does plan have a narrative that describes:			Plan Section
a. Description of existing land uses	◉ Yes	◯ No	C-2, Sec E-H
b. Management practices used to generate credits	◉ Yes	◯ No	C-2, Sec. J
c. Amount of credit being generated	◉ Yes	◯ No	C-2, Sec. O
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	C-2, Sec. M
e. Location where credits will be generated	◉ Yes	◯ No	Attachment A
f. Timeline for credits and agreements	◉ Yes	◯ No	C-2 Sec. O-P
g. Method for quantifying credits	◉ Yes	◯ No	C-2 Sec. F

Water Quality Trading Checklist

Form 3400-208 (1/14)

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	C-2 Sec. P
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	C-2 Sec. Q
j. Reporting requirements should the management practice fail	◉ Yes	○ No	C-2 Sec P, 3
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	Attachment I
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	Attachment D
m. Practice registration documents, if available	◉ Yes	○ No	Attachment G
n. History of project site(s)	◉ Yes	○ No	C-2, Sec C
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
Sam Sotham	2-20-24

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
Kayla Nahar	2-20-2024

RIETHMILLER

ATTACHMENT L

Certification of Section C-2 of The Water Quality Trading Plan

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schaf

Kayla Schaf, City Clerk

Project Engineer:

Larry Gotham 2-20-24

Larry Gotham P.E., Morgan & Parmley Ltd.

Attachment M

From: Craig, Andrew D - DNR
To: Arch, James
Cc: Hartenbower, Benjamin P - DNR; Claucherty, Matthew L - DNR
Subject: RE: WQT trade fields and ag producer name and map showing field location
Date: Tuesday, January 22, 2019 9:05:11 AM

Your report is exactly what we needed, Jim. Thank you for stopping by Wayne's place to confirm field history.

We will use this info within our review of the Greenwood WQT.

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

Andrew Craig
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov

From: Arch, James <James.Arch@co.clark.wi.us>
Sent: Monday, January 21, 2019 12:03 PM
To: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Cc: Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
Subject: RE: WQT trade fields and ag producer name and map showing field location

Morning Andrew,

Just wanted to follow up with you on the Wayne Reithmiller field. I stopped and talked to Wayne on Sat. Wayne said that the whole 20 acres was seeded down into a grass-alfalfa mix in the spring of 2018. The field was previously in corn silage for 3 years and a mow board plow was used each year. The map I sent you that shows the sod boarder should have been moved further west. There was a corn field there but that is outside of the 20 acres in question.

Let me know if you have any more questions Andrew.

Jim Arch
Clark Co. Land Conservationist
517 Court Street, Room 102
Neillsville, WI 54456
715-743-5102

From: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Sent: Friday, January 18, 2019 4:00 PM
To: Arch, James <James.Arch@co.clark.wi.us>

Cc: Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
Subject: RE: WQT trade fields and ag producer name and map showing field location

Thanks Jim for compiling the map and providing your report on current crops on field.

The SNAP report submitted to us states the entire field is in corn silage (and has been the prior two years). Your report confirms a section of the field is now in grass sod, not corn silage.

The other item we would like to confirm is has the field been received MB plow in last two years. This is what the SNAP dbase shows that was submitted for review. This is important b/c MB plow creates more soil disturbance/soil loss than other tillage types. You stated MB plow is still a regular tool used in Clark County (used primary on fields with rocky soils – rocks damage chisel or chisel disc plow equipment; MB plow is not damaged from rocks.

For what its worth, can you please stop to discuss our questions re: crop and tillage history for field with Wayne either tonight or sometime next week?

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

Andrew Craig
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov

From: Arch, James <James.Arch@co.clark.wi.us>
Sent: Thursday, January 17, 2019 11:43 AM
To: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Cc: Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
Subject: RE: WQT trade fields and ag producer name and map showing field location

Morning Andrew,

I checked out the Wayne Riethmiller field and part of that field is in sod-see attached map. The part to the west of the hay is was in corn, I couldn't see to the back so I can't speak to what that was. If you want I can try and stop and talk to Wayne after work tonight.

Jim Arch
Clark Co. Land Conservationist
517 Court Street, Room 102
Neillsville, WI 54456

715-743-5102

-----Original Message-----
From: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Sent: Tuesday, January 15, 2019 5:32 PM
To: Arch, James <James.Arch@co.clark.wi.us>
Cc: Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
Subject: WQT trade fields and ag producer name and map showing field location

Jim,

Thanks for talking with me by phone today re: Greenwood WQT proposal.

Below is the landowner and field info we discussed. Can you please review and let us know if you can confirm use of moldboard plow?

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

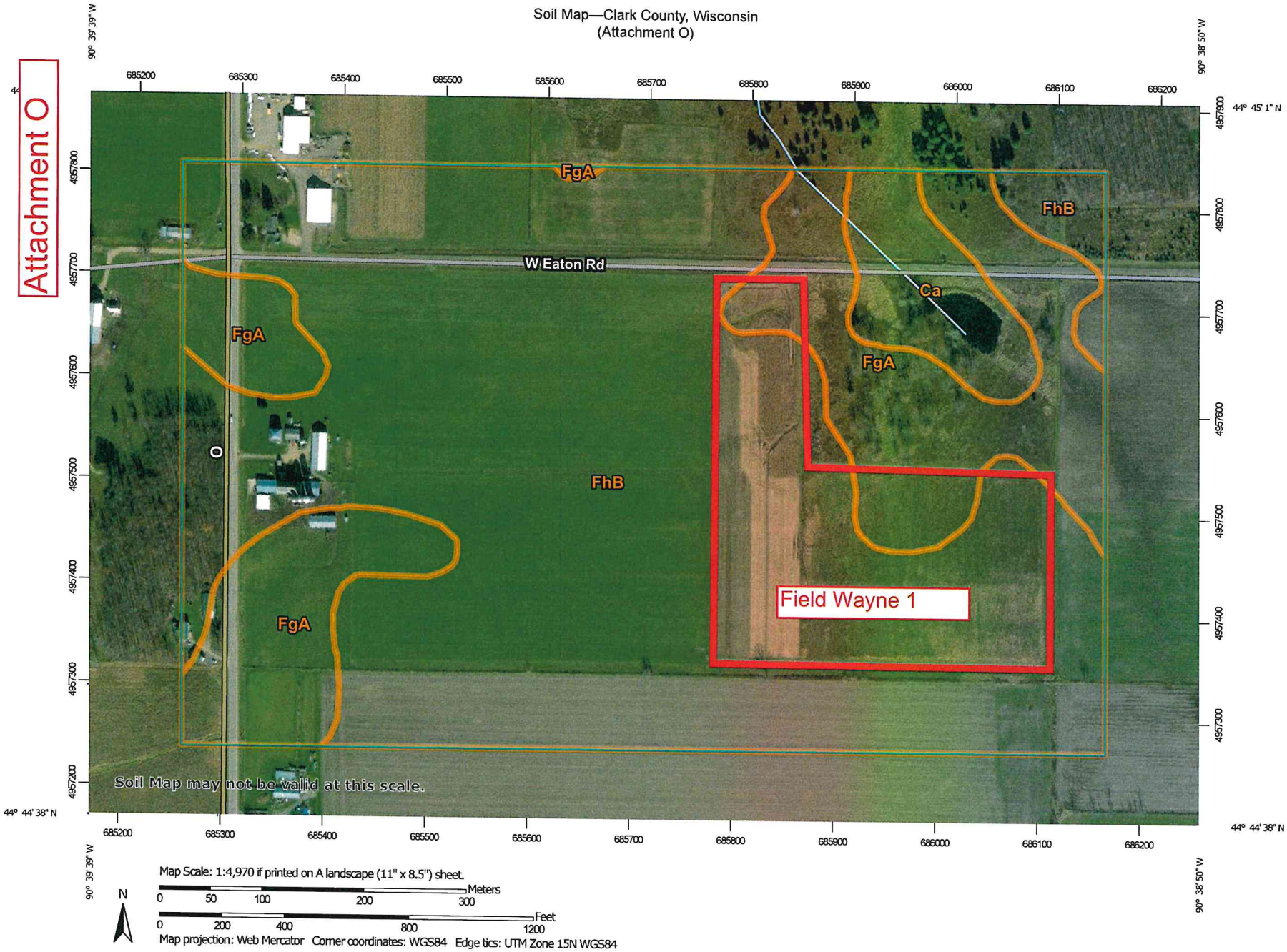
Andrew Craig
Nonpoint Source Watershed Planning Coordinator - Bureau of Watershed Management Division of External Services Wisconsin Department of Natural Resources
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov<mailto:Andrew.Craig@wisconsin.gov>

Photo 1. of Wane Riethmiller's Plow

Photo 2. of Wane Riethmiller's Plow

Attachment O

Soil Map—Clark County, Wisconsin
(Attachment O)



Map Scale: 1:4,970 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County, Wisconsin
Survey Area Data: Version 17, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2015—Nov 7, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

WATER QUALITY TRADING INSPECTION FORM
FOR THE CITY OF GREENWOOD, Field Wayne 1, Wayne Riethmiller Farm
LOCATION: THE NE 1/4 - SW ¼, SECTION 8, T.26N. – R.2W.

Date: 11/13/2019 Inspector: Ezra Gotham Weather: 18°, Cloudy, Snowing
Inspection Frequency (circle one): Monthly Quarterly Semi-Annual
Practice compliance (check appropriate box)
Seeding year ☐
Photo taken ☒
Established perennial hay crop ☒
Filter strip ☒
Summary of findings: Field Wayne 1 looks good, grass is thick, appears to be predominantly timothy. Part of field Wayne 1 had drown out and was reseeded in the spring according to Wayne Riethmiller.

Identification of Items of non-compliance: Fields outside the WQT agreement were seeded to more than 5 acres of corn as modeled in the WQT plan, due to the delay of the WPDES permit and Agreement.

Corrective measures required: Plant no more than 5 Acres of Corn silage in 2020.

Notice of **non-compliance** to the DNR required: Yes: _____ No: ____X____
Phosphorus credits used by City (annual report only): 10.29 lb (Revised 1-29-20)
Phosphorus credits available (annual report only): 123.71 LB (Revised 1-29-20)
Phosphorus credits deductions for failed practice

Field #	Failed practice & reason	Credit Deduction

FIELD # WHERE PHOTO WAS TAKEN	# OF PHOTOS TAKEN	GENERAL CONDITION OF FIELD
Wayne 1	2	See attached photos with notes

Looking South from the center of Field Wayne 1

Looking East at the portion of field Wayne 1 reseeded in 2019. This portion of the field was reseeded due to drown out according to Wayne Riethmiller. No harvest was made on this section of the field, the field conditions were too wet for harvest throughout the summer.

Soil Analysis

Submitted By: **BN06005**
EZRA GOTHAM
24406 County Highway F
New Auburn, WI 54757-5346

Submitted For:
EZRA GOTHAM
24406 CTH F
NEW AUBURN, WI 54757

AgSource LABORATORIES

Laboratory Sample #
CT74680 - CT74689

Date Received:
12/07/2023

Date Processed:
12/08/2023

Information Sheet #
715493

Lab ID: 7103-22 to 7103-26
State: WI **Acres:** 21
County: Clark **Tiled:** No
Plow Depth: 7 **Irrigated:** No

Field: **WAYNE_1**
Soil Name: Flambeau
Map Unit:

WISCONSIN NUTRIENT RECOMMENDATIONS

Cropping Sequence	Yield Goal - per acre -	Nutrient Needs N	P_2O_5	K_2O	Fertilizer Credits Legume N --- lbs/a ----
		--------- lbs/a ---------			
Grass, hay	4	130	55.00	225.00	0.00

LABORATORY ANALYSIS

Sample No.	Text Code	Est CEC	Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	SO4-S ppm	Density	Buffer pH	60-69 Lime	% Base Saturation %K	%Ca	%Mg	Tot %	%H
1	2		6.4	3.3	15	64							0.91	7.1						
2	2		6.5	3.2	34	91							0.94	7.2						
3	2		6.4	3.2	44	83							0.89	7.2						
4	2		6.1	2.6	17	66							0.91	7.1						
5	2		6.0	3.2	16	71							0.90	7.1						
Adjusted Avg:			6.3	3.1	16	75														

INTERPRETATION

	Very Low	Low	Medium	Optimum	High	Very High	Excessive
Phosphorus				Optimum			
Potassium		Low					

There is no lime recommendation for this rotation. Please see Additional Information below.

ADDITIONAL INFORMATION

- If a legume crop preceeds the first crop listed on the sample submission form, N credits should be subtracted from the N recommendation for the first crop listed. See Chapter 9 in UWEX Publication A2809 for more details.
- If manure, biosolids, septage or other waste materials have been applied to this field, be sure to take nutrient credits and adjust fertilizer rate. See Chapter 9 in UWEX Publication A2809 for more details.
- Recommended rates are the total amount of nutrients to apply (N-P-K), including starter fertilizer.
- A lime recommendation is calculated only when soil pH is more than 0.2 units below the optimum pH. Starter fertilizer (e.g. 10 + 20 + 20 lbs N + P205 + K2O/a) is advisable for row crops on soils slow to warm in the spring.
- A soil nitrate test may better estimate actual corn N needs. If conservative tillage leaves more than 50% residue cover when corn follows after corn, add an additional 30 N lb/a.

DISCLAIMER: Data and information in this report are intended solely for the individual(s) for whom samples were submitted. Reproduction of this report must be in its entirety. Levels listed are guidelines only. Data was reported based on standard laboratory procedures and deviations.

106 North Cecil Street, PO Box 7 • Bonduel, WI 54107 • P: 715.758.2178 • bonduel@agsource.com

C-3 Trading Partner Plan

Patti Suda

C-3 TRADING PARTNER: PATTI SUDA

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PATTI SUDA ATTACHMENTS:

A. HUC 12 Map
B. Patti Suda Farm Map
C. SnapPlus Reports, Existing Conditions
D. Farm Discharge Point
E. SnapPlus Reports, Proposed Conditions
F. Management Practice Registration Form
G. DNR Trade Ratio Calculation
H. Operation and Maintenance Manual
I. Water Quality Trading Checklist
J. Certification of Section C-3 of the Water Quality Trading Plan
K. 2019 Inspection
L. 2023 Current Soil Test

C-3 <u>TRADING PARTNER</u>: PATTI SUDA

A. EXECUTIVE SUMMARY:

We propose to continue Phosphorus trading on two fields owned by Patti Suda. The farm was acquired in 2018, it was formerly part of a larger dairy farm. Field Patti 1 & 2 were rented out for row crop production for 2016 and 2017. The fields used for this trade tested excessively high in Phosphorous from past manure applications, but have fairly low PTP under current management because the fields were set up to be farmed on the contour, when they were part of the dairy farm. Field Patti 1 & 2 will be converted from row crop production to a conservation easement in perennial vegetation, harvested for hay. The remainder of the farm is currently established in grass hay, which makes it ineligible for this water quality trade because no credit can be generated from it. Fields will remain in hay production for the term of the contract.

Field Patti 1 & 2 will generate on average approximately 75 lb. of PTP per year. The proposed trade ratio to be applied will have an Uncertainty factor of 1:1, Equivalency Factor N/A, Downstream Trading Factor of 1.1:1. The proposed minimum trade ratio is 1.2:1 (*PTP of 75± /1.2= 63± lb. of tradeable Phosphorous*) see table 3 for year by year credit generation. This WQT plan update will use the same SnapPlus Model as WQT plan WQT-2019-0006, because the field is in perennial vegetation and operating conditions will not change for this term. The last five years of the SnapPlus model will be used "2019-2023", and brought forward to "2024-2028"; i.e. 2019 will now be known as 2024 and so on. Tillage was used to prepare the seedbed for perennial vegetation in 2018, the following five years in perennial vegetation have no tillage, as such 2018 is not representative of the current conditions, and is not used for Phosphorus credit generation in WQT Plan #2.

B. LOCATION OF AGRICULTURAL PROPERTY: The farm generating phosphorus credits is located upstream of the City of Greenwood's outfall, in the same HUC 12 watershed, but runoff from the farm discharges into the Black River through an intermittent stream approximately 1000' downstream of the WWTF Outfall (see Attachment D for discharge location). Attachment A shows the drainage area's HUC 12 map with the Suda Farm highlighted. The fields are located in the W ½ of the SE ¼, of Section 33, T27N-R2W, Town of Werner, Clark County. Please refer to Attachment B for locations of fields Patti 1, Patti 2.

C. EXISTING OPERATION (2016-2017): Field Patti 1 and Patti 2 were part of a dairy farm owned by Walter Hribar, they tested excessively high in phosphorous from historical over application of manure and made good candidates for a Water Quality Trade. The land was rented out for row crop production: Patti 1 was seeded to soybeans in 2016 and 2017, field Patti 2 was seeded to corn in 2016, and soybeans in 2017. The crops grown in 2016 were determined based upon the Cropland Data Layer from National Agriculture Statistics Service (CropScape); the crop grown in 2017 was verified by the remaining stubble at the time of soil sampling. The remainder of the tillable land had been in hay for 2016 and 2017 and was not included this trade because no credit can be generated from it.

D. SOIL SAMPLING: Soil samples for fields Patti 1 & 2, were collected in April of 2018, refer to Attachment B for field map. Soil samples for the fields in the trade were collected in accordance with UWEX Publication A2100. All soil samples were tested by the UW lab in Marshfield. Sampling procedure: fields were divided into approximately 5 acre sections; one composite sample was made for each section. The sample was comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples were averaged to create a single recommendation for that field. See Attachment C for results.

E. CROPLAND: There are approximately 54 total tillable acres on the farm; Field Patti 1 is 17 acres, Field Patti 2 is 7 acres, they were converted from row crops to permanent hay in 2018. The remaining 30 ± acres of tillable land is in hay production.

F. SnapPlus - MODELING: SnapPlus version 17.1 was used to generate baseline PTP under existing conditions. The existing conditions of fields (2016-2017) in this trade were generated by observing site conditions at the time of soil sampling and using standard farming practices of the area. Nutrient application was based on removal of nutrients contained in the grain. The owners were unable to obtain and provide crop input information from the renters for 2016 or 2017. So conservative estimates were made.

1. **Previous 2 Years of Cropping History (2016-2017):** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and the crop residue at the time of soil sampling were used to determine cropping history. Field Patti 1 was seeded to soybeans in 2016 and 2017, field Patti 2 was seeded to corn in 2016, and soybeans in 2017.
2. **Current Conditions To Be Projected:** Nutrient applications, cropping and tillage data from 2016 and 2017 were projected out to 2023.
3. **Tillage:** The fields within this trade were modeled as being chisel plowed and disked to prepare the seedbed for corn and soybeans.
4. **Rotation:** For the purposes of this WQT plan the rotation from 2016 and 2017 was projected out to 2023 and then extended to 2028. Field Patti 1 will be continuous soybeans and field Patti 2 will be in a Corn grain -Soybean rotation.
5. **Credit Generation:** The Phosphorous Credits that we will be claiming will be generated, by perennial vegetative cover. Perennial vegetation (hay) works to reduce Phosphorous runoff by trapping particulate Phosphorus, and also by no longer tilling the field which increases Phosphorous in runoff.
6. **Nutrients:** There will be no nutrients from manure modeled because there is not a record from 2016 or 2017 of any applications. Commercial fertilizer will be the only nutrient source modeled. The farm fields that were rented for row crop production had nutrient applications based upon nutrient removal in the grain or standard rates which would be consistent with the practice of short term cash rent. Short term cash renters often apply nutrients without the benefit of a soil test, or apply the same fertilizer rate and blend on multiple farms to simplify the process of ordering and application.: Corn grain removes 0.38 lb. of Phosphorous and 0.29 lb. of potassium per bushel of grain at 15.5% moisture and 10 lb. of sulfur per 150 bu. Soybeans remove 0.80 lb. of Phosphorous and 1.4 lb. of potassium per bushel of grain at 13% moisture, and 0.18 lb. per bu. sulfur.

    1. **Soybeans** @ 46 bu. per ac.
        - (46 bu.x0.80=37 lb.). phosphorous applied as 80 lb. of 18-46-0 (DAP))
        - (46 bu.x1.4=64.4 lb.). potassium applied as 107 lb. of 0-0-60 (Potash)
        - 50 lb. of Ammonium sulfate (AMS) standard practice of farmers, soybeans remove 0.18 lb. per bu. of sulfur but yield response is not reliable.
    2. **Corn** @ 151 bu. per ac. standard dry fertilizer corn starter 9-20-30 @ a common rate used by farmers of 250 lb. per acre, which would supply: (9% x 250 lb.=22.5 lb. Nitrogen), (20% x 250 lb.=50 lb. Phosphorous), (30% x 250 lb.=75 lb. Potassium)
        - (151 bu. x 0.38=57 lb.). phosphorous required, applied 50 lb.
        - (151bu. x 0.29=44 lb.). potassium required, applied 75 lb.
        - 50 lb. of ammonium sulfate (AMS) @ 21-0-0-24s=12 lb. sulfur applied and 10.5 lb. Nitrogen
        - 140 lb. nitrogen recommendation: (22.5 lb. in starter fertilizer + 10.5 lb. applied in AMS + (225 lb. urea x 46% nitrogen=103.5 lb.)=137 lb. applied

G. EXISTING ROW CROP PRODUCTION (2016-2017):

1. **Corn Production** with a yield goal of 151-170 bu. per acre. Nutrient applications are based on the low end of the range. The seedbed for plating corn was prepared by spring chisel plowing and disking. The following nutrient application data is standard for corn. See Attachment C for specific field application data.
    - Commercial starter fertilizer 250 lb. per acre of 9-20-30
    - Sidedress application 50 lb. of ammonium sulfate and 225 lb. urea
    - total application to the crop 137-50-75, not including N credit from soybeans
2. **Soybean Production** with a yield goal of 46-55 bu. per acre. Nutrient application was based on the low end of the range. The seedbed for plating soybeans was prepared by spring chisel plowing and disking. It was not evident that the soybeans were drilled or planted in 30" rows, so they were modeled in 15"-20" rows which reduces the PTP for the farm by approximately 10lb. per year from 30" rows. The following nutrient application data is the standard for soybean production. See Attachment C for specific field application data.
    - 80 lb. DAP 18-46-0 = 14-37-0 pounds per acre
    - 50 lb. AMS 21-0-0-24s=11-0-0-12s pounds per acre
    - 107 lb. Potash 0-0-60 = 0-0-64 pounds per acre
    - Theoretical total application to the crop 25-37-64 pounds per acre

H. POTENTIAL TRADEABLE PHOSPHORUS UNDER ROW CROP PRODUCTION (BASELINE): SnapPlus Modeling was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model the fields under row crop production to generate a baseline PTP. The crop and nutrient applications were modeled to 2023 and extended to 2028 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The following Attachments were generated through the modeling process. Attachment C includes the following SnapPlus reports:

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

TABLE 1 – Patti Suda Row Crop Conditions (BASELINE)

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
PATTI SUDA	PATTY1	FLAMBEAU	FhB	16.6	66	66	66	66	65	65
PATTI SUDA	PATTY2	FLAMBEAU	FhB	6.7	26	15	26	15	26	15
Total PTP					**92**	**81**	**92**	**81**	**92**	**80**

I. CREDIT GENERATION – UNDER PERENNIAL VEGETATION:
After Water Quality Trading Plan WQT-2019-0006 was approved by the DNR and by the City of Greenwood, the farm installed or implemented the conservation practices listed in the following section. The City and Patti Suda entered into an agreement to maintain the conservation practices. The agricultural land is used to generate Phosphorus Credits through reduction of tillage and installing perennial vegetation (hay). The perennial vegetation was installed in 2018 as part of WQT-2019-006 and will remain for the following term, under WQT Plan #2.

1. **Nutrient Management.** Field Patti 1 and Patti 2 tested high in Phosphorous and will be operated to draw down the Phosphorus level. This will be done by withholding nutrient applications and removing crops without replacing the Phosphorus. Phosphorus will be drawn down to the optimum level on the soil test, before Phosphorous containing fertilizers will be applied.
2. **Soil Sampling.** Soil sampling will be conducted on a 4 year schedule to monitor the nutrients. The soil tests will be used to prescribe the proper fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section and the sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the AgSource Laboratories. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension A2100. **Soil samples were taken 11-4-2023 to monitor drawdown of Phosphorus from the soil, field Patti 1 average is 18 PPM phosphorus down from 63 PPM, field Patti 2 adjusted average phosphorus is 85 PPM down from 120 PPM phosphorus in 2018 testing. See attachment L for current soil test**
3. **Cropping.** The fields were seeded to alfalfa/grass with an oat nurse crop in 2018; 2019 to the termination of the contract the field will remain in grass hay.
4. **Tillage:** The field was prepared for planting by a single pass of a vertical tillage tool, at a depth of approximately 1 ½". The field will not be tilled again for the term of the contract unless, to repair a greater erosion risk.
5. **Seeding:**
   - **Soil preparation.** The field was prepared for planting by a single pass of a vertical tillage tool at a depth of approximately 1 ½".
   - **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

20%	Alfalfa
30%	Fescue
20%	Timothy
30%	Orchard Grass

   - **Nurse Crop.** 1 bushel per acre of oats was seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment. Oats are a cool season annual grass that provide ground cover.

   - **Seed Placement.** Seed was sown by broad casting with a sufficient amount of fertilizer to obtain the desired spread pattern through a fertilizer spreader. Upon final seed placement a single pass was made with a roller.
   - **Harvest.** As appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

J. POTENTIALLY TRADEABLE PHOSPHORUS – PERENNIAL VEGETATION: Will be generated through a Conservation Easement (contract) which generates credit though a reduction

of tillage and perennial vegetation (hay), which provides year round ground cover and phosphorous trapping abilities. The following SnapPlus reports are included in Attachment E to document the proposed operating conditions of the fields.

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

TABLE 2 – PTP Perennial Vegetation

Farm	Field	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
						2024	2025	2026	2027	2028
PATTI SUDA	PATTY1	FLAMBEAU	FhB	16.6	23	8	7	5	4	4
PATTI SUDA	PATTY2	FLAMBEAU	FhB	6.7	11	6	5	4	4	3
Total PTP					**34**	**14**	**12**	**9**	**8**	**7**

K. PHOSPHORUS TRADE RATIOS: The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratios. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices. Following are the trade ratio factors:

- **Delivery -** N/A Credit generator and user within same HUC 12
- **Downstream –** 1.1:1 The runoff from this field discharges into the Black River approximately 1000' downstream of the WWTF Outfall, via an intermittent stream See Attachment D
- **Equivalency -** N/A for Phosphorus
- **Uncertainty –** Conservation Easement, perennial vegetation for the term of the contract. 1:1 per. Appendix H, of Guidance for implementing Water Quality Trading in WPDES Permits, 6/1/2020, Edition 2
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Patti Suda and the City of Greenwood WWTF**.

L. REPORTING:

(REFER TO ATTACHMENT H – OPERATION, MAINTENANCE AND INSPECTION PLAN)

M. PHOSPHORUS CREDIT GENERATION: Credits are calculated as the difference between phosphorus lost under baseline practices (row crop production) and phosphorus lost under the proposed practices (perennial vegetation). The credits are calculated on an annual basis. The table below shows the trade rates per year beginning in 2018 and extending to 2028. Credits available in 2018 upon successful establishment of perennial vegetation (hay).

TABLE 3: TRADEABLE PHOSPHORUS

	Soil Series	Soil Symbol	Acres	PTP 2018	PTP 2019	PTP 2020	PTP 2021	PTP 2022	PTP 2023
					2024	2025	2026	2027	2028
Past Practices PTP	FLAMBEAU	FhB	**23.3**	**92**	**81**	**92**	**81**	**92**	**80**
Perennial Vegetation PTP	FLAMBEAU	FhB	**23.3**	**34**	**14**	**12**	**9**	**8**	**7**
Total PTP	FLAMBEAU	FhB	**23.3**	**58**	**67**	**80**	**72**	**84**	**73**
Total Credits w/1.2:1 trade ratio			**23.3**	**48**	**56**	**67**	**60**	**70**	**61**

N. MANAGEMENT PRACTICE REGISTRATION: Submit the following to the DNR to register that the management practices have been installed (2018):

- Date of contract *The Water Quality Trading Agreement was signed 8/13/2019 and extends through the next permit term of 7-1-2024 to 6-30-2029*
- Management Practice Registration form *Attachment F*
- Date corrective measures have been completed (*none)*
- Date of 90% ground cover and photo verification *(See Attachment K for photo) verification).*
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season. (*none)*

1. **Monthly Reporting:** Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**
2. **Annual Reporting**: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:
   - Verification that site inspection has occurred
   - Brief summary of site inspection findings
   - Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
   - At least 1 photo of the perennial vegetation, indicating condition
   - A summary of credits used each month over the calendar year
3. **Notification of Problems That Affect Credit Generation:** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the city are not being generated as approved in the WQT plan. The city will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

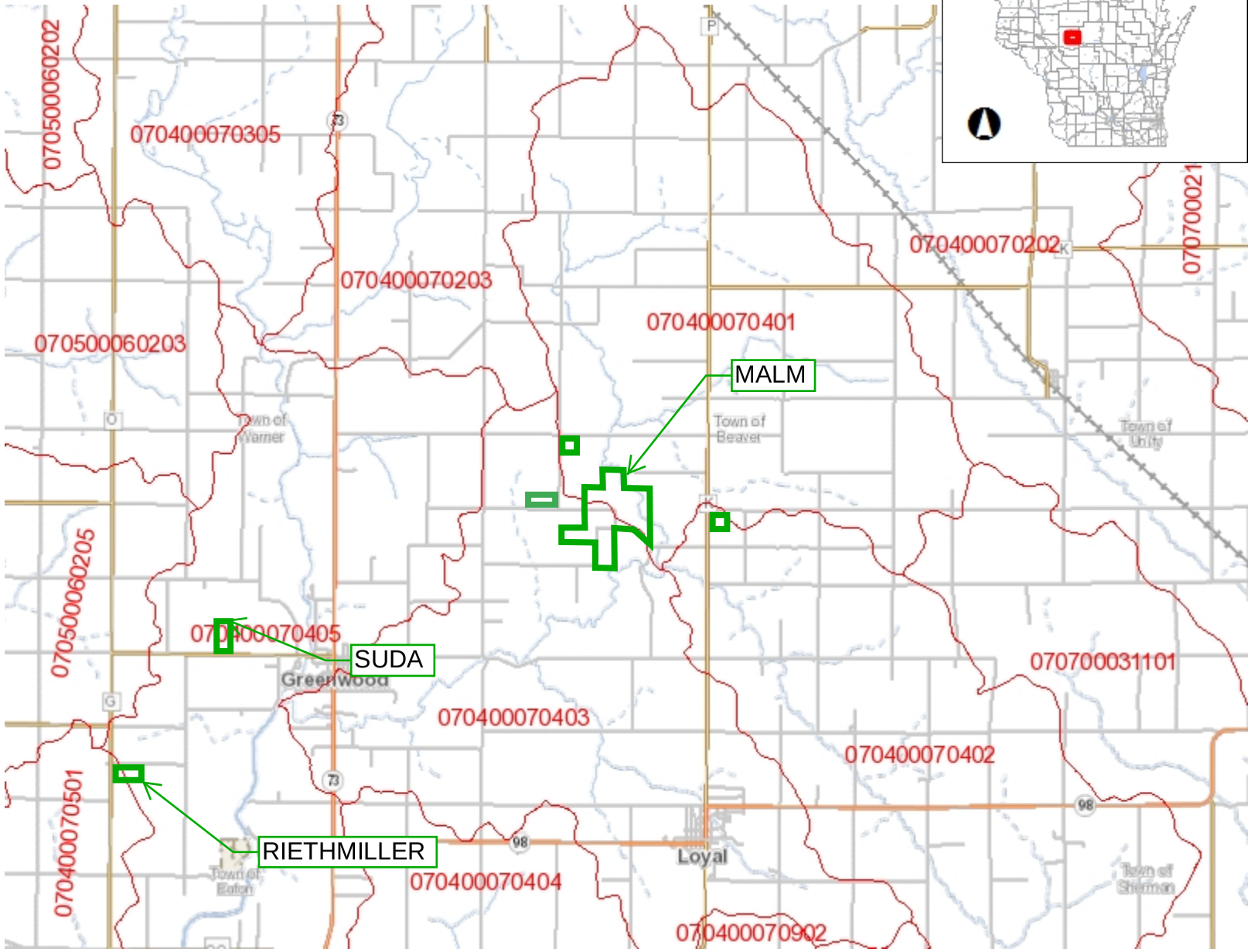
O. DNR RIGHT OF ENTRY: Patti Suda grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

P. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST

This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 5, page 45 of Guidance for Implementing Water Quality Trading Plans, Guidance No:3800-2020-05; Form 3400-208 is included as Attachment I. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit". Below are listed the checklist questions, **bold and underlined**, with the answers following.

• **Permittee's/credit user's WPDES permit number**:	No. WI 020249-09
• **Permittee's/credit users contact information:**	Kayla Schar, City Clerk 201 S. Main Street Greenwood WI 54437 Phone 715-267-6205
• **Pollutant for which credit will be generated:**	Phosphorus
• **Amount of Credits available from each location, management practice, local government unit when acting as broker:**	See Table 3, page 6
• **Certification that the content of the trading application is accurate and correct**.	See Attachment J
• **Signature and date of signature of permittee's/ credit users authorized representative:**	See Attachment J
• **Location where credits will be generated:**	See Attachment A and B
• **Identification of methods including management practices that will be used to generate credits:**	See Section I, page 4
• **Duration of agreement with each credit generator:**	5 years with the provision of extension, unless WPDES removes the phosphorous requirement
• **Schedule for installation/construction of each management practice:**	See Section I, page 4
• **Operation and Maintenance plan for each management practice**,	See Attachment H
• **Date when credits become available for each management practice:**	See Section M, Page 5
• **Models used to derive the amount of credits:**	SnapPlus, see Attachment C & E
• **The applicable trade ratio for each management practice including supporting technical basis:**	See section K, page 5

Greenwood and Adjacent HUC 12's



Legend

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

ATTACHMENT A
SUDA

Notes

4.0 0 2.00 4.0 Miles

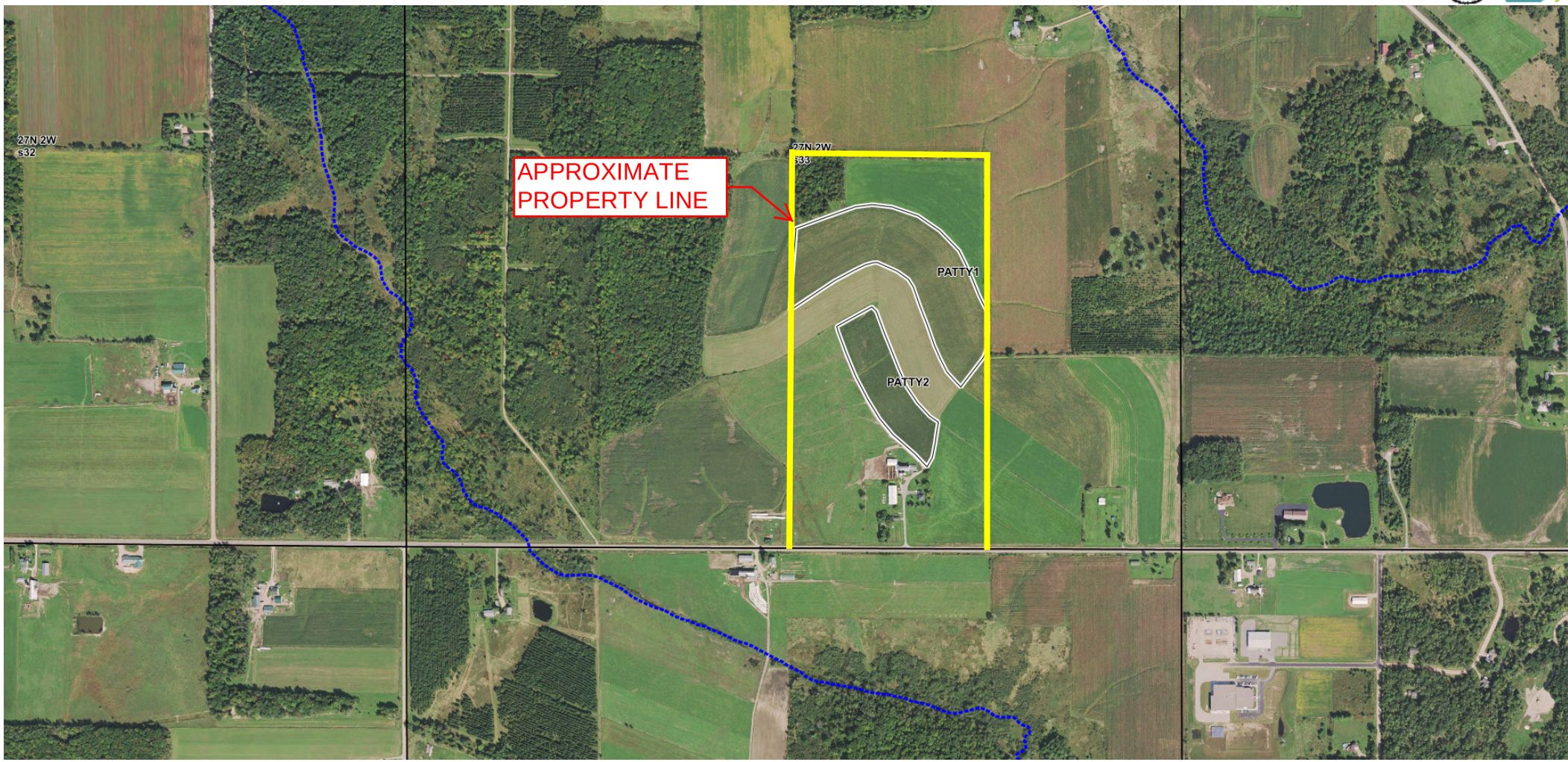
NAD_1983_HARN_Wisconsin_TM

1: 126,720

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

Attachment B

Map Generated on:9/5/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:27N 2W s33



- Intermittent Streams
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

ATTACHMENT B
SUDA

SUDA
ATTACHMENT C

NM1: Narrative and Crops Report

Starting Year	**2018**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date:	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb

Prepared for:
PATTI SUDA
attn:PATTI SUDA

Farm has 2 fields totalling 23.3 acres
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Acres	2018	2019	2020	2021	2022	2023
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Soybeans 15-20 inch row Spring Chisel, disked 46-55
PATTY2	6.7	Corn grain Spring Chisel, disked 151-170	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Corn grain Spring Chisel, disked 151-170	Soybeans 15-20 inch row Spring Chisel, disked 46-55	Corn grain Spring Chisel, disked 151-170	Soybeans 15-20 inch row Spring Chisel, disked 46-55

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

Crops Grouped By Category		2018	2019	2020	2021	2022	2023
Soybeans 15-20 inch row	Acres	17 859	23 1,162	17 859	23 1,162	17 859	23 1,162
Corn grain	Acres	7 1,124		7 1,124		7 1,124	

FM6: Soil Test Report

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
PATTI SUDA
attn:PATTI SUDA

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
PATTY1		16.6	FhB	FLAMBEAU	2018-05-03	Soil & Forage Analysis Lab	2075	3	1	7.0	2.9	63	270	0	0
PATTY2		6.7	FhB	FLAMBEAU	2018-05-03	Soil & Forage Analysis Lab	4793	1	1	7.0	2.8	120	274	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2018	2019	2020	2021	2022	2023
PATTY1	2018-05-03					X	
PATTY2	2018-05-03					X	

FM2: Application Summary Report

Starting Year	**2018**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date:	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
PATTI SUDA
attn:PATTI SUDA

Annual Manure Production And Use By Source

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

Source

Application Results Reported For Farm All

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2018	2019	2020	2021	2022	2023
Produced from Manure (lb)	Ninj	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0
	K2O	0	0	0	0	0	0
Total Available Manure Nutrients Applied (lb)	Ninj	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0
	K2O	0	0	0	0	0	0
Total Fertilizer Nutrients Applied (lb)	N	1,333	583	1,333	583	1,333	583
	P2O5	949	862	949	862	949	862
	K2O	1,582	1,515	1,582	1,515	1,582	1,515
Total Crop Removal (lb)	P2O5	1,066	932	1,066	932	1,066	932
	K2O	1,464	1,631	1,464	1,631	1,464	1,631
Nutrient Balance (Applied - Crop removal, lb)	P2O5	-117	-70	-117	-70	-117	-70
	K2O	118	-117	118	-117	118	-117

NM3: Field Data and 590 Assessment Plan

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb

Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23 Total Acres Reported.

Field Name	Sub Farm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	N/Fld Res	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 P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
PATTY1				16.6	Clark	FLAMBEAU FhB	4	250	0 - 2	1001 - 5000	%	On contour / No	No	No	Sg15-Sg15-Sg15-Sg15-Sg15-Sg15-Sg15-Sg15	SCD-SCD-SCD-SCD-SCD-SCD-SCD-SCD	2016-2023	**5**	**3.2**	**-0.2**	**4**	63	-24	0
PATTY2				6.7	Clark	HUMBIRD HuC	9	150	0 - 2	1001 - 5000	W %	On contour / No	No	No	Cg-Sg15-Cg-Sg15-Cg-Sg15-Cg-Sg15	SCD-SCD-SCD-SCD-SCD-SCD-SCD-SCD	2016-2023	**3**	**3.5**	**0.1**	**4**	120	-52	-100

Crop Abbreviations

Abbreviation	Crop
Cg	Corn grain
Sg15	Soybeans 15-20 inch row

Tillage Abbreviations

Abbreviation	Tillage
SCD	Spring Chisel, disked

Restriction Legend

Code	Description of Code
S	Field is in SWQMA
D	Drinking water well within 50 feet of field.
C	Conduit to groundwater within 300 feet
L	Local restrictions on nutrient applications.
%	Slope restriction for winter applications
P	High permeability N restricted soils
R	N restricted soils with less than 20 inches to bedrock
W	N restricted soils with less than 12 inches to apparent water table
+	This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present.

FM3: Producer's Plan Report

Crop Year	**2018**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb

Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2017 Crop and Tillage	2018 Crop and Tillage	Adjusted Crop Need lb/ac	2018 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	20	0	25-37-65	45-37-65	45-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	830 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	1,328 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	1,776 lb
											legume		20-0-0	
PATTY2	6.7	Soybeans 15-20 inch row Spring Chisel, disked	Corn grain Spring Chisel, disked	140-0-0	0	0	137-50-75	137-50-75	0-50-75	3-0-0	9-20-30 9-20-30	250 lb	Spring Subsurface	1,675 lb
											Ammonium sulfate (AMS) 21-0-0	50 lb	Summer Unincorp	335 lb
											Urea 46-0-0	225 lb	Summer Unincorp	1,508 lb

FM3: Producer's Plan Report

Crop Year	**2019**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**
SnapPlus Version 17.1 built on 2018-05-25	
M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb	

Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2018 Crop and Tillage	2019 Crop and Tillage	Adjusted Crop Need lb/ac	2019 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	20	0	25-37-65	45-37-65	45-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	830 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	1,328 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	1,776 lb
											legume		20-0-0	
PATTY2	6.7	Corn grain Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	0	0	25-37-65	25-37-65	25-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	335 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	536 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	717 lb

FM3: Producer's Plan Report

Crop Year	**2020**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2019 Crop and Tillage	2020 Crop and Tillage	Adjusted Crop Need lb/ac	2020 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	20	0	25-37-65	45-37-65	45-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	830 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	1,328 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	1,776 lb
											legume		20-0-0	
PATTY2	6.7	Soybeans 15-20 inch row Spring Chisel, disked	Corn grain Spring Chisel, disked	140-0-0	0	0	137-50-75	137-50-75	0-50-75	3-0-0	9-20-30 9-20-30	250 lb	Spring Subsurface	1,675 lb
											Ammonium sulfate (AMS) 21-0-0	50 lb	Summer Unincorp	335 lb
											Urea 46-0-0	225 lb	Summer Unincorp	1,508 lb

FM3: Producer's Plan Report

Crop Year	**2021**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**
SnapPlus Version 17.1 built on 2018-05-25	
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Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2020 Crop and Tillage	2021 Crop and Tillage	Adjusted Crop Need lb/ac	2021 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	20	0	25-37-65	45-37-65	45-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	830 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	1,328 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	1,776 lb
											legume		20-0-0	
PATTY2	6.7	Corn grain Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	0	0	25-37-65	25-37-65	25-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	335 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	536 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	717 lb

FM3: Producer's Plan Report

Crop Year	**2023**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**
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Prepared for:
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2022 Crop and Tillage	2023 Crop and Tillage	Adjusted Crop Need lb/ac	2023 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	20	0	25-37-65	45-37-65	45-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	830 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	1,328 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	1,776 lb
											legume		20-0-0	
PATTY2	6.7	Corn grain Spring Chisel, disked	Soybeans 15-20 inch row Spring Chisel, disked	0-0-0	0	0	25-37-65	25-37-65	25-37-65	0-0-0	Ammonium sulfate (AMS) 21-0-0	50 lb	Spring Unincorp	335 lb
											Diammonium phosphate (DAP) 18-46-0	80 lb	Spring Unincorp	536 lb
											Potassium chloride 0-0-61	107 lb	Spring Unincorp	717 lb

WQ1: P Trade Report

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16
SnapPlus Version 17.1 built on 2018-05-25	
M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb	

Prepared for:
PATTI SUDA
attn:PATTI SUDA

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

Questions? Please contact DNRphosphorus@wisconsin.gov

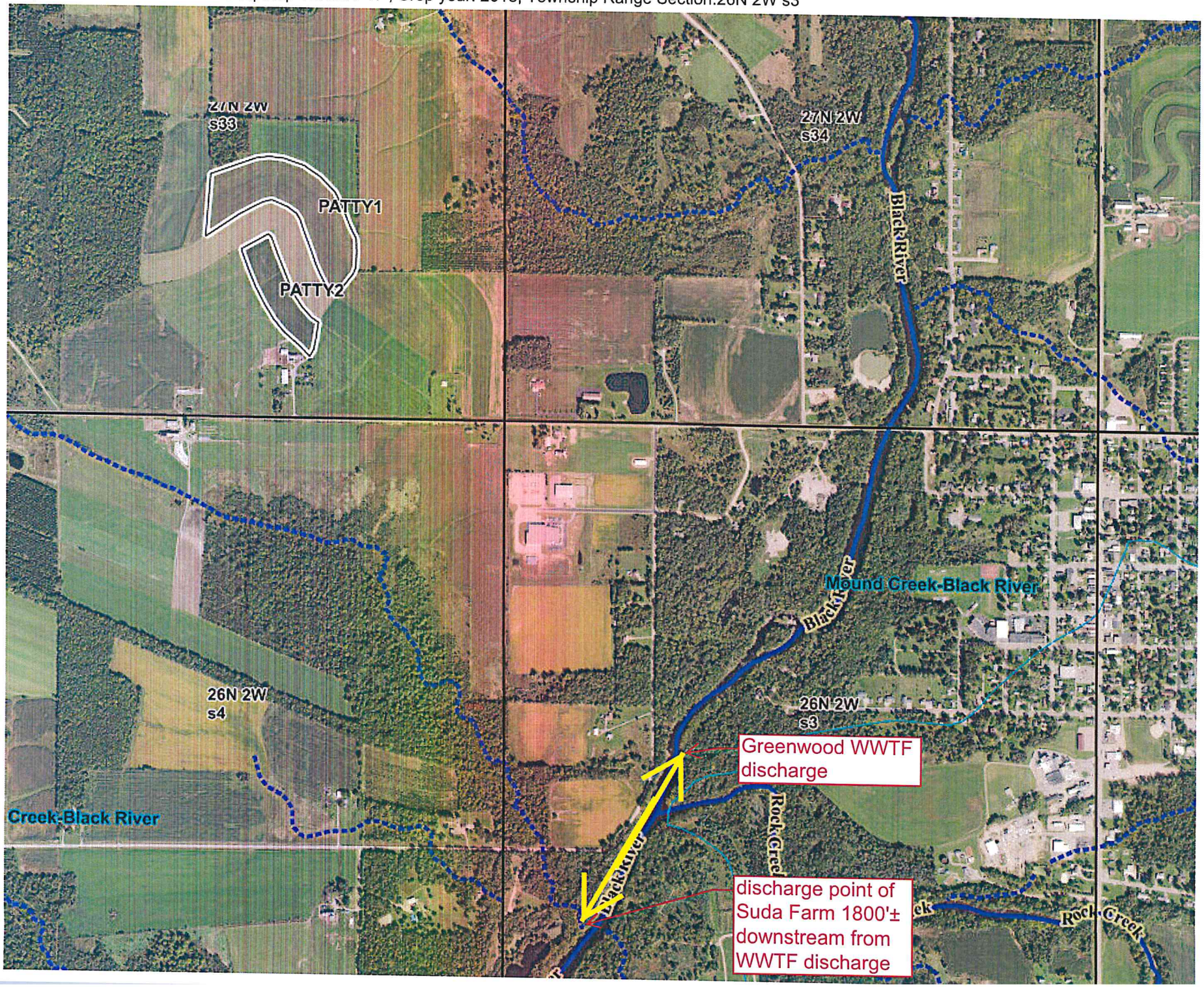
For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

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

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022	2023
PATTY1	FLAMBEAU	FhB	17	66	66	66	66	65	65
PATTY2	FLAMBEAU	FhB	7	26	15	26	15	26	15
Total			**23**	**92**	**81**	**92**	**81**	**92**	**80**

Attachment D

Map Generated on:9/5/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s3



SUDA

ATTACHMENT D

SUDA
ATTACHMENT E

NM1: Narrative and Crops Report

Starting Year	**2018**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date:	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
PATTI SUDA
attn:PATTI SUDA

Farm has 2 fields totalling 23.3 acres
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Acres	2018	2019	2020	2021	2022	2023
PATTY1	16.6	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage 30-60	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4
PATTY2	6.7	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage 30-60	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4	Grass hay None 3.1-4

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

Crops Grouped By Category		2018	2019	2020	2021	2022	2023
Grass hay	Acres		23 82	23 82	23 82	23 82	23 82
Oats w/ Alfalfa/Grass Seeding Spring	Acres	23 1,035					

FM6: Soil Test Report

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
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attn:PATTI SUDA

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
PATTY1		16.6	FhB	FLAMBEAU	2018-05-03	Soil & Forage Analysis Lab	2075	3	1	7.0	2.9	63	270	0	0
PATTY2		6.7	FhB	FLAMBEAU	2018-05-03	Soil & Forage Analysis Lab	2075	1	1	7.0	2.8	120	274	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2018	2019	2020	2021	2022	2023
PATTY1	2018-05-03					X	
PATTY2	2018-05-03					X	

FM2: Application Summary Report

Starting Year	**2018**
Reported For	**PATTI SUDA**
Printed	**2018-09-06**
Plan Completion/Update Date:	**2018-05-16**

SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
PATTI SUDA
attn:PATTI SUDA

Annual Manure Production And Use By Source

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

Source

Application Results Reported For Farm All

Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

		2018	2019	2020	2021	2022	2023
Produced from Manure (lb)	Ninj	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0
	K2O	0	0	0	0	0	0
Total Available Manure Nutrients Applied (lb)	Ninj	0	0	0	0	0	0
	P2O5	0	0	0	0	0	0
	K2O	0	0	0	0	0	0
Total Fertilizer Nutrients Applied (lb)	N	0	2,144	2,144	2,144	2,144	2,144
	P2O5	0	0	0	0	0	0
	K2O	2,144	0	0	0	0	0
Total Crop Removal (lb)	P2O5	1,282	1,282	1,282	1,282	1,282	1,282
	K2O	4,893	4,544	4,544	4,544	4,544	4,544
Nutrient Balance (Applied - Crop removal, lb)	P2O5	-1,282	-1,282	-1,282	-1,282	-1,282	-1,282
	K2O	-2,749	-4,544	-4,544	-4,544	-4,544	-4,544

NM3: Field Data and 590 Assessment Plan

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb

Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23 Total Acres Reported.

Field Name	Sub Farm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	N/Fld Res	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 P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
PATTY1				16.6	Clark	FLAMBEAU FhB	4	250	0 - 2	1001 - 5000	%	On contour / No	No	No	OgAGs-GH-GH-GH-GH-GH	SVT-None-None-None-None-None	2018-2023	**5**	**0**	**1.5**	**0**	63	-330	
PATTY2				6.7	Clark	HUMBIRD HuC	9	150	0 - 2	1001 - 5000	W %	On contour / No	No	No	OgAGs-GH-GH-GH-GH-GH	SVT-None-None-None-None-None	2018-2023	**3**	**0**	**1.5**	**1**	120	-330	-83

Crop Abbreviations

Abbreviation	Crop
GH	Grass hay
OgAGs	Oats w/ Alfalfa/Grass Seeding Spring

Tillage Abbreviations

Abbreviation	Tillage
None	None
SVT	Spring vertical tillage

Restriction Legend

Code	Description of Code
S	Field is in SWQMA
D	Drinking water well within 50 feet of field.
C	Conduit to groundwater within 300 feet
L	Local restrictions on nutrient applications.
%	Slope restriction for winter applications
P	High permeability N restricted soils
R	N restricted soils with less than 20 inches to bedrock
W	N restricted soils with less than 12 inches to apparent water table
+	This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present.

FM3: Producer's Plan Report

Crop Year	**2018**
Reported For	**PATTI SUDA**
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SnapPlus Version 17.1 built on 2018-05-25

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Prepared for:
PATTI SUDA
attn:PATTI SUDA

Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2017 Crop and Tillage	2018 Crop and Tillage	Adjusted Crop Need lb/ac	2018 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Soybeans 15-20 inch row Spring Chisel, disked	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-0-0	20	0	0-0-92	20-0-92	0-0-92	0-0-0	Potassium chloride 0-0-61	150 lb	Spring Unincorp	2,490 lb
											legume		20-0-0	
PATTY2	6.7	Soybeans 15-20 inch row Spring Chisel, disked	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	20-0-0	20	0	0-0-92	20-0-92	0-0-92	0-0-0	Potassium chloride 0-0-61	150 lb	Spring Unincorp	1,005 lb
											legume		20-0-0	

FM3: Producer's Plan Report

Crop Year	**2019**
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2018 Crop and Tillage	2019 Crop and Tillage	Adjusted Crop Need lb/ac	2019 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-0-0	60	0	92-0-0	152-0-0	22-0-0	0-0-0	Urea 46-0-0	200 lb	Spring Unincorp	3,320 lb
											legume		60-0-0	
PATTY2	6.7	Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage	Grass hay None	130-0-0	40	0	92-0-0	132-0-0	2-0-0	0-0-0	Urea 46-0-0	200 lb	Spring Unincorp	1,340 lb
											legume		40-0-0	

FM3: Producer's Plan Report

Crop Year	**2020**
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Printed	**2018-09-06**
Plan Completion/Update Date	**2018-05-16**
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2019 Crop and Tillage	2020 Crop and Tillage	Adjusted Crop Need lb/ac	2020 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	3,320 lb
PATTY2	6.7	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	1,340 lb

FM3: Producer's Plan Report

Crop Year	**2021**
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2020 Crop and Tillage	2021 Crop and Tillage	Adjusted Crop Need lb/ac	2021 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	3,320 lb
PATTY2	6.7	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	1,340 lb

FM3: Producer's Plan Report

Crop Year	**2022**
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Prepared for:
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2021 Crop and Tillage	2022 Crop and Tillage	Adjusted Crop Need lb/ac	2022 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	3,320 lb
PATTY2	6.7	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	1,340 lb

FM3: Producer's Plan Report

Crop Year	**2023**
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Prepared for:
PATTI SUDA
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Field Data: 23.3 Total Acres Reported.

Field Name	Ac.	2022 Crop and Tillage	2023 Crop and Tillage	Adjusted Crop Need lb/ac	2023 Legume Credit N lb/ac	2nd Year N Manure Credit lb/ac	Manure Fert Apps lb/ac	Total Credits and Apps	Over-Application based on UW Recs	Under-Application based on UW Recs	Product Name and Analysis	Rate per Acre	Season and Method	Field Amount
PATTY1	16.6	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	3,320 lb
PATTY2	6.7	Grass hay None	Grass hay None	130-0-0	0	0	92-0-0	92-0-0	0-0-0	38-0-0	Urea 46-0-0	200 lb	Spring Unincorp	1,340 lb

WQ1: P Trade Report

Reported For	PATTI SUDA
Printed	2018-09-06
Plan Completion/Update Date	2018-05-16
SnapPlus Version 17.1 built on 2018-05-25	
M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb	

Prepared for:
PATTI SUDA
attn:PATTI SUDA

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

Questions? Please contact DNRphosphorus@wisconsin.gov

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

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

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022	2023
PATTY1	FLAMBEAU	FhB	17	23	8	7	5	4	4
PATTY2	FLAMBEAU	FhB	7	11	6	5	4	4	3
Total			**23**	**34**	**14**	**12**	**9**	**8**	**7**

SUDA

ATTACHMENT F

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
City of Greenwood	WI- 020249-09	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Lonna Klinke	102 N. Main Street	Greenwood	WI	54437

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 ◉ Agricultural NPS ○ Other		Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips	1,000	1.2:1	Snap plus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Clark	Black River	see attached maps	Phosphorous

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
Lamy Lotham	8-6-18

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
Lonna Klinke	8-6-18

Leave Blank -- For Department Use Only

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

SUDA
ATTACHMENT G

Larry Gotham

To: Ezra Gotham (egotham@centurytel.net)
Subject: FW: Greenwood WQT

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

From: Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
Sent: Tuesday, September 12, 2017 8:53 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
Subject: RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

From: Fassbender, Lori - DNR
Sent: Monday, September 11, 2017 4:55 PM
To: Larry Gotham <lgotham@centurytel.net>
Cc: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Subject: RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

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

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

From: Larry Gotham [mailto:lgotham@centurytel.net]
Sent: Friday, March 31, 2017 10:22 AM
To: Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
Subject: Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

Larry Gotham, P.E., R.L.S.
Morgan & Parmley, Ltd.
rusk surveying
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

Larry Gotham

From: Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
Sent: Friday, February 02, 2018 9:17 AM
To: Larry Gotham; Fassbender, Lori - DNR
Cc: Ezra Gotham; Hartenbower, Benjamin P - DNR
Subject: RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

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

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

> **From:** Larry Gotham [mailto:lgotham@centurytel.net]
> **Sent:** Thursday, February 01, 2018 2:05 PM
> **To:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
> **Cc:** Ezra Gotham <egotham@centurytel.net>
> **Subject:** RE: Greenwood WQT
>
> Hi Pat:
> Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.
>
> **Larry Gotham, P.E., R.L.S.**

Operation, Maintenance & inspection Plan
Field Patti 1 & 2, Patti Suda Farm
For Water Quality Trading
City of Greenwood

The goal of the operation and maintenance plan is to ensure that the perennial grass cover will persist. The primary purpose of the grass cover is to reduce the phosphorus and sediments that leave the farm and degrade water quality on the Black River. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop.

Section 1 - Seeding Year 2018

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** as hay at the boot stage. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6" or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6" or after September 1st.

E. **Inspection Frequency** shall be **monthly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

Section 2 - 2019 and beyond

1. **Weed Management**,
    - Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
    - Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edge. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for soil erosion.
2. **Erosion control**. It is unlikely that there will be erosion issues or gully formation after the first year; the site has no highly erodible lands and no evidence of valleys or gullies in the fields. If erosion becomes evident with monthly inspections, it will be repaired as listed below:
    - Erosion will be filled by tillage or by importing topsoil
    - The area will be seeded with the original grass mix as listed in the water quality trading plan.
    - Erosion mat will be applied to the reseeded area.
    - American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.
3. **Harvesting**. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand.
    - The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
    - Frequency of the cutting will be dictated by the forage quality required.
    - The field should not be harvested after September 1st to allow for winter ground cover.
4. **Nutrient Management.** The field will be operated to draw down the high phosphorus level as based upon UW soil tests. This will be done by removing the grass hay crop without replacing Phosphorous. The nutrients will be drawn down to the optimum level on the soil test, at which point in time fertilizer can be applied to maintain the optimum level on the soil test. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the optimum level.
5. **Soil Sampling.** Soil sampling will be completed on a 4 year schedule to monitor the nutrients and maintain them at a level no higher than the optimum range. The soil tests will be used to prescribe the correct fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section. The sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW Soil & Forage Analysis Lab in Medford. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension Bulletin A2809.
6. **Inspection** is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be monthly during the growing season. The following inspection and reporting procedure shall be used:
    - **Monthly Reporting (<u>seeding year</u>)** - Each month the Soil Conservationist or Engineer shall file the report with the Clerk assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly

discharge report certifying that management practices established are in good condition and properly maintained. This monthly update will also be used to record the following:

  - Harvest dates
  - Approximate hay yields to determine nutrient removal rate

- **Quarterly Reporting (<u>second year</u>)** Quarterly reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>third year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer, and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Notification of Problems with Permanent Grass Cover -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

WATER QUALITY TRADING INSPECTION FORM
FOR THE CITY OF GREENWOOD
LOCATION: THE W1/2 - SE ¼, SECTION 33, T.27N. – R.2W.

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual
Practice compliance (check appropriate box)
Seeding year ☐
Photo taken ☐
Established perennial hay crop ☐
Summary of findings:

_____
_____
_____
_____
_____

Identification of Items of non-compliance:

_____
_____
_____

Corrective measures required:

_____
_____
_____

Notice of **non-compliance** to the DNR required: Yes: _____ No: _____
Phosphorus credits used by City (annual report only): _____
Phosphorus credits available (annual report only): _____
Phosphorus credits deductions for failed practice

Field #	Failed practice & reason	Credit Deduction

FIELD # WHERE PHOTO WAS TAKEN	# OF PHOTOS TAKEN	GENERAL CONDITION OF FIELD

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
City of Greenwood	WI- 020249-10	

Facility Address	City	State	ZIP Code
Clearwater Drive	Greenwood	WI	54437

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Kayla Schar	201 S. Main Street	Greenwood	WI	54437

Project Name

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Black River	Phosphorus	070400070405

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: See Attachment A
- ○ 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				

Water Quality Trading Checklist

Form 3400-208 (1/14)

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	Perennial Vegetation "Conservation easement"	Snap-plus	not assigned	◉ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part
◯ Urban NPS ◯ Agricultural NPS ◯ Other				◯ Yes ◯ No ◯ Only in part

Does plan have a narrative that describes:			Plan Section
a. Description of existing land uses	◉ Yes	◯ No	C-3, Sec C-G
b. Management practices used to generate credits	◉ Yes	◯ No	C-3, Sec. I
c. Amount of credit being generated	◉ Yes	◯ No	C-3, Sec. A
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	C-3, Sec. K
e. Location where credits will be generated	◉ Yes	◯ No	Attachment A
f. Timeline for credits and agreements	◉ Yes	◯ No	C-3 Sec. M
g. Method for quantifying credits	◉ Yes	◯ No	C-3 Sec. F

Water Quality Trading Checklist

Form 3400-208 (1/14)

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	C-3 Sec. L
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	C-3 Sec. O
j. Reporting requirements should the management practice fail	◉ Yes	○ No	C-3 Sec. N
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	Attachment H
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	Attachment D
m. Practice registration documents, if available	◉ Yes	○ No	Attachment F
n. History of project site(s)	◉ Yes	○ No	C-3, Sec C
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
Kam Lotham	2-20-24

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
Kayla Jones	2-20-2024

SUDA
ATTACHMENT J

Certification of Section C-3 of The Water Quality Trading Plan

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schar

Kayla Schar, City Clerk

Project Engineer:

Larry Gotham 2-20-24

Larry Gotham P.E., Morgan & Parmley Ltd.

WATER QUALITY TRADING INSPECTION FORM
FOR THE CITY OF GREENWOOD, Patti Suda Farm
LOCATION: THE W1/2 - SE ¼, SECTION 33, T.27N. – R.2W.

Date: 11-13-19___ Inspector: _Ezra Gotham_____ Weather: 18° cloudy__

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual
Practice compliance (check appropriate box)
Seeding year ☐
Photo taken ☒
Established perennial hay ☒
Summary of findings: Field Patti 1 & Patti 2 have Grass, Clover, and Alfalfa present. The stand is primarily grass, although not as dense as would be expected, possible winter kill from winter of 2018-2019. A late hay cutting was taken, the fields show little regrowth for winter protection. The concentrated flow channels in the field are well established with grass and appear to be in good condition.

Identification of Items of non-compliance:

Corrective measures required: _
_No corrective measures at this time, the grass stand should improve with time and will be reevaluated at the with the next inspection

Notice of **non-compliance** to the DNR required: Yes: _____ No: __X_____
Phosphorus credits used by City (annual report only): ____56 lb.____(Revised 1-27-20)_____
Phosphorus credits available (annual report only): _____0 lb. (Revised 1-27-20)_____
Phosphorus credits deductions for failed practice

Field #	Failed practice & reason	Credit Deduction

FIELD # WHERE PHOTO WAS TAKEN	# OF PHOTOS TAKEN	GENERAL CONDITION OF FIELD
Patti 1 & 2	2	See attached photo with notes

Field Patti 2, looking down the concentrated flow channel

Field Patti 1, Looking east from the center of the field.

Soil Analysis

Submitted By: **BN06005**
EZRA GOTHAM
24406 County Highway F
New Auburn, WI 54757-5346

Submitted For:
EZRA GOTHAM
24406 CTH F
NEW AUBURN, WI 54757

AgSource LABORATORIES

Laboratory Sample #
CT74680 - CT74689

Date Received:
12/07/2023

Date Processed:
12/08/2023

Information Sheet #
715493

Lab ID: 7103-17 to 7103-19
State: WI **Acres:** 17
County: Clark **Tiled:** No
Plow Depth: 7 **Irrigated:** No

Field: **PATTI_1**
Soil Name: Flambeau
Map Unit:

WISCONSIN NUTRIENT RECOMMENDATIONS

Cropping Sequence	Yield Goal - per acre -	Nutrient Needs N	P_2O_5	K_2O	Fertilizer Credits Legume N --- lbs/a ----
		--------- lbs/a ---------			
Grass, hay	4	130	55.00	195.00	0.00

LABORATORY ANALYSIS

Sample No.	Text Code	Est CEC	Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	SO4-S ppm	Density	Buffer pH	60-69 Lime	% Base Saturation %K	%Ca	%Mg	Tot %	%H
1	2		6.3	2.8	19	125							0.87	7.3						
2	2		6.4	3.2	16	111							0.88	7.1						
3	2		6.4	3.5	35	146							0.87	7.2						
Adjusted Avg:			6.4	3.2	18	127														

INTERPRETATION

	Very Low	Low	Medium	Optimum	High	Very High	Excessive
Phosphorus				Optimum			
Potassium				Optimum			

There is no lime recommendation for this rotation. Please see Additional Information below.

ADDITIONAL INFORMATION

- If a legume crop preceeds the first crop listed on the sample submission form, N credits should be subtracted from the N recommendation for the first crop listed. See Chapter 9 in UWEX Publication A2809 for more details.
- If manure, biosolids, septage or other waste materials have been applied to this field, be sure to take nutrient credits and adjust fertilizer rate. See Chapter 9 in UWEX Publication A2809 for more details.
- Recommended rates are the total amount of nutrients to apply (N-P-K), including starter fertilizer.
- A lime recommendation is calculated only when soil pH is more than 0.2 units below the optimum pH. Starter fertilizer (e.g. 10 + 20 + 20 lbs N + P205 + K2O/a) is advisable for row crops on soils slow to warm in the spring.
- A soil nitrate test may better estimate actual corn N needs. If conservative tillage leaves more than 50% residue cover when corn follows after corn, add an additional 30 N lb/a.

DISCLAIMER: Data and information in this report are intended solely for the individual(s) for whom samples were submitted. Reproduction of this report must be in its entirety. Levels listed are guidelines only. Data was reported based on standard laboratory procedures and deviations.

106 North Cecil Street, PO Box 7 • Bonduel, WI 54107 • P: 715.758.2178 • bonduel@agsource.com

Soil Analysis

Submitted By: **BN06005**
EZRA GOTHAM
24406 County Highway F
New Auburn, WI 54757-5346

Submitted For:
EZRA GOTHAM
24406 CTH F
NEW AUBURN, WI 54757

Laboratory Sample #
CT74680 - CT74689

Date Received:
12/07/2023

Date Processed:
12/08/2023

Information Sheet #
715493

Lab ID: 7103-20 to 7103-21
State: WI **Acres:** 7
County: Clark **Tiled:** No
Plow Depth: 7 **Irrigated:** No
Field: **PATTI_2**
Soil Name: Humbird
Map Unit:

WISCONSIN NUTRIENT RECOMMENDATIONS

Cropping Sequence	Yield Goal - per acre -	Nutrient Needs N	P_2O_5	K_2O	Fertilizer Credits Legume N --- lbs/a ----
		--------- lbs/a ---------			
Grass, hay	4	130	0.00	100.00	0.00

LABORATORY ANALYSIS

Sample No.	Text Code	Est CEC	Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	SO4-S ppm	Density	Buffer pH	60-69 Lime	% Base Saturation %K	%Ca	%Mg	Tot %	%H
1	2		6.4	3.1	129	144							0.96	7.4						
2	2		6.2	3.4	41	141							0.81	7.2						
Adjusted Avg:			6.3	3.3	85	143														

INTERPRETATION

	Very Low	Low	Medium	Optimum	High	Very High	Excessive
Phosphorus							Excessive
Potassium					High		

There is no lime recommendation for this rotation. Please see Additional Information below.

ADDITIONAL INFORMATION

- At least one map unit for the soil has a different interpretation for soil group and/or soil yield potential. The interpretations presented are based on the interpretation of the majority of the map units. For more detailed information about individual map units see: SnapPlus nutrient management software or https://snapplus.wisc.edu/planning/soil-details/.
- If a legume crop preceeds the first crop listed on the sample submission form, N credits should be subtracted from the N recommendation for the first crop listed. See Chapter 9 in UWEX Publication A2809 for more details.
- If manure, biosolids, septage or other waste materials have been applied to this field, be sure to take nutrient credits and adjust fertilizer rate. See Chapter 9 in UWEX Publication A2809 for more details.
- Recommended rates are the total amount of nutrients to apply (N-P-K), including starter fertilizer.
- A lime recommendation is calculated only when soil pH is more than 0.2 units below the optimum pH. Starter fertilizer (e.g. 10 + 20 + 20 lbs N + P205 + K2O/a) is advisable for row crops on soils slow to warm in the spring.
- A soil nitrate test may better estimate actual corn N needs. If conservative tillage leaves more than 50% residue cover when corn follows after corn, add an additional 30 N lb/a.

DISCLAIMER: Data and information in this report are intended solely for the individual(s) for whom samples were submitted. Reproduction of this report must be in its entirety. Levels listed are guidelines only. Data was reported based on standard laboratory procedures and deviations.

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