M & P Project No. 12-180

-WATER QUATLITY TRADING PLAN (WQTP)-

for

Village of Hawkins Wastewater Treatment Facility

Hawkins Wisconsin

November, 2017

Prepared by:

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SECTION I - INTRODUCTION

A. EXECUTIVE SUMMARY

The Village of Hawkins will complete a Water Quality Trading Plan to comply with the phosphorus limit requirements of the WPDES Permit. The Village proposes to purchase an active dairy farm and convert the row crop farming to permanent hay. The Village will trade with themselves to meet the phosphorus requirements. On an annual basis, over the last ten years, the Village of Hawkins has discharged an average of 117 pounds per year of phosphorous. The rate varies from a low of 9 pounds per year to a maximum of 355 pounds per year. The WPDES Permit limits the phosphorous discharge to Main Creek at approximately 22 pounds per year. For design purposes, the Village proposes to mitigate (350#/year – 22#/year) X 1.2 = 400#/year of phosphorus by Water Quality Trading with themselves. Upon approval of this Water Quality Trading Report, the Village will exercise their option to purchase the Olson Farm which will generate 1,000 pounds of phosphorus credits for the Village. The Village proposes to sell the remaining 600# of phosphorus credits.

B. BACKGROUND AND NEED

The Village of Hawkins owns and operates a municipal Wastewater Treatment Facility (WWTF). This WWTF is authorized to operate by the DNR under its current WPDES Permit, No. WI 0024201-09-1 and is due to expire June 30, 2018.

The existing WWTF was constructed in 1983 and consists of a two-cell aerated lagoon system with a seasonal storage cell that can be operated as a fill & draw, or a continuous discharge. A control building is located between the cells, and an outfall pipe, with valves, is located at the west end of the seasonal storage cell. There is a flow control valve and effluent meter located at the outfall to South Fork of Main Creek. The outfall is located in HUC 070500040303.

The Village's WWTF has been meeting the WPDES Permit's effluent limits since it was placed on line, following construction in 1983. In their current WPDES Permit, issued on July 1, 2013, Item 5.2, Water Quality Based Effluent Limits (WQBELs) contained a schedule to meet the future (final) phosphorus effluent limit of 0.124 mg/L, six-month average; 0.372 mg/L, monthly average; and 0.4 lbs./day. The current phosphorus limit is 4 mg/l which is being met. This will expire on July 1, 2018.

The operator has been collecting phosphorous data in various forms since 2005. The influent and effluent concentrations vary. The average influent phosphorous concentrations were 4.3 mg/l over this period. The average effluent concentration was 1.3 mg/l (2014-2015) and the average annual pounds of phosphorous discharged is 117 (2005-2015). The pounds vary from a low of 9 in 2015 to a high of 283 pounds in 2011. However, in 2016, the average effluent phosphorous concentration varied from 0.7 to 2.7 mg/l over the spring and fall discharge periods. The 2016 average was 1.6 mg/l or 355 pounds of total phosphorus discharged to the surface water for the entire year. The average annual flow was 21.5 million gallons (2010-2015). Coupling the average annual flow to the final water quality based effluent limits of 0.124 mg/l of phosphorous yields a total permitted phosphorous discharge of only 22 pounds per year.

Since the WPDES permit will only allow 22 pounds of phosphorous to be discharged to the South Fork of Main Creek on an annual basis, and the WWTF has discharged a maximum 355 pounds, all exceedances must be mitigated. **Water Quality Trading (WQT) will be used as the method to comply with the required phosphorous effluent limits at the outfall to the South Fork of Main Creek.**

SECTION II - WATER QUALITY TRADING

A. PURPOSE:

This Water Quality Trading Plan for phosphorous will be used by the Village of Hawkins to comply with the future WPDES permit requirements for effluent phosphorous. The Village will continue to discharge to the South Fork of Main Creek but will offset the discharge limit exceedances for phosphorous at the outfall by crediting the nonpoint discharge phosphorous runoff reductions from an agricultural property. The agricultural practices on the property will be modified to reduce the phosphorus discharge from cropland by eliminating tillage and unincorporated applications of dairy herd manure.

The cropland was modeled with SnapPlus, under the farm's current management system and again under a continuous grass hay system, to quantify the potentially tradeable phosphorus. The farmstead will also be evaluated for tradeable phosphorus through the removal of a barnyard, animal housing and all impervious surfaces. The Village will purchase the property, to have complete control for the duration.

Credits generated by the above will be traded by the Village to comply with their WPDES permit, excess credits will be available for sale to other WPDES permit holders, subject to their respective trade ratios and DNR approval.

B. LOCATION:

1. **Location of Outfall**: The Village of Hawkins discharges from its WWTF outfall to the South Fork of Main Creek at approximate latitude 45.51158°, longitude 90.70847°. The discharge point is located in HUC 12, number 070500040303
2. **Location of Agricultural Property**: The property generating the phosphorus credits is located upstream of the Village of Hawkins outfall in the same HUC 12 watershed. The property discharges to an unnamed perennial waterway that splits the property. Attachment A shows the drainage area's HUC 12 map and Attachment B shows an aerial view of the Olson property. The agricultural property, Olson Farm, consists of the NE ¼ of the NW ¼, and the SE ¼ of the NW ¼, Section 7, T.35N.-R.2W., located in the Town of Kennan, Price County.

The unnamed waterway which passes through the center of the farm originates east of the farm and north of USH 8. This photo is taken looking south, down the centerline of the farm road. The unnamed waterway fills the roadway as it flows from east to west. The water flows into Stony Creek and then the South Fork of Main Creek; all in the same HUC 12 and above the WWTF outfall. This roadway will be obliterated and restored to grass during the conversion.

C. EXISTING OPERATING CONDITONS OF THE FARM:

1. **Existing Operation.** The farm has been under the management of Brian Olson as a dairy farm. The 80 acre farm is home to a continuous milking herd of approximately 50 cows plus associated dry cows and young stock. The manure from the dairy herd is applied to all the tillable acreage on the farm. The primary crop grown is corn silage due to the small land base available to the farm. Spring tillage is performed to create the seed bed for the following crop.

2. **Soil Sampling.** Soils were sampled on fields 3, 4-1, 4-2, and 5 (pasture) in November 2016, refer to Attachment E for field location. The Soils in field 6 were sampled in March 2017, the soil was not frozen at the time of sampling, field 7-0, 7-1, 8 were sampled September of 2017. Fields were divided into approximately 5 acre sections. One composite sample was made for each section; the sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples were sent to the UW Soil & Forage Analysis Lab in Medford. Fields with multiple composite samples were averaged to create a single recommendations for that field. See Attachment C for results.

3. **Cropland.** There are 68± tillable acres on the Olson farm. In the 2017 crop year: approximately 45 acres were planted to corn for silage with the goal of producing 500 ton of corn silage; approximately 8 acres were in grass hay; and approximately 14 acres in pasture. In the 2016 Crop year: 26 acres of corn silage were planted but only 10 acres were harvested due to the fact that field 6 was too wet to harvest; 27 acres were in grass hay production and the remaining 14± acres were pastured.

This photograph is taken from Field 8 looking southeast into Fields 7-0 and 7-1. Concentrated feeding is done along the buildings, with runoff travelling down the farm road into the unnamed waterway.

The manure loading area receives runoff from Fields 7, 7-1, 8 and the building site. Runoff travels beneath the barn cleaner and down the farm road into the waterway. There is no filter strip, only concentrated flow on the eroded farm road.

4. Nutrients from Manure

A. 50 milking cows are confined indoors for their entire lactation. For purposes of calculation, 43- 1400 pound cows will be in their 2nd lactation and 7- 1200 pound cows will be 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
- [(365 days x 148 lb. manure x 43) + (365 days x 127 lb. manure x 7)]/2000 lb.= 1324 ton of manure/53 acres of cropland = 25 ton per acre of manure spread on all cropped Fields

Verification Check: Olson's use a 400 bushel (heaped) manure spreader and spread 4 times per week. This equates to a level spreader of 1870 gallons. Therefore:

(1870/7.48 gal. per cu. ft. x 60 lb. per cu. ft. x 4 times per week) x 52 weeks /2000 lb. = 1560 ton versus 1324 ton as calculated

B. Dry cows are not confined in housing and have access to pasture. A portion of the pasture receives high density stocking around the buildings and feed bunk, the remainder of the pasture is low density stocking. The manure will be split with 50% being deposited on each type of pasture.

- (7 - 1200 lb. dry cows x 98.5± lb. of manure per day x 365 days)/2000lb.= 126 ton/year
- (7 - 1000 lb. heifers x 82± lb. of manure per day x 365 days)/2000lb.= 105ton/year
- (105 ton + 126 ton) x 50%)/0.7 ac. = application rate of 165 ton. per. acre on a high stocking density pasture **Field 7-1**
- (105 ton + 126 ton) x 50%)/10.7 ac. = application rate of 10.8 ton. per. acre on a low stocking density pasture **Field 5**

C. Young stock are not confined in housing and have access to pasture. A portion of the pasture receives high density stocking around the buildings and feed bunk, the remainder of the pasture is low density stocking. The manure will be split 50% being deposited on each type of pasture.

- (10 - 250 lb. heifers x 21± lb. of manure per day x 365 days)/2000lb.=38 ton
- (10 - 500 lb. heifers x 42± lb. of manure per day x 365 days)/2000lb.=77 ton
- (10 - 750 lb. heifers x 65± lb. of manure per day x 365 days)/2000lb.=119 ton
- (38+77+119) x 50%/3.4 ac.=34 ton per. acre on low density pasture **Field 8**
- (38+77+119) x 50%/.2 ac.=585 ton per. acre on high density pasture **Field 7-0**

5. Nutrient Sources Applied to Silage Corn

- Commercial starter fertilizer 200 lb. per acre of 9-20-30
- Commercial fertilizer 100 lb. per acre of 46-0-0
- Manure 25 ton per acre (from 4.A. above) applied containing 50 lb. N, 75 lb. P2O5, and 125 lb. K2O; based upon UW standard values @ 11-20% dry matter.

6. Summary Table of Current Farm Management Practices to be Modeled in SnapPlus

FARM INPUT SUMMARY – CURRENT PRACTICES						
		POUNDS OF NUTRIENTS APPLIED PER. ACRE				
FIELD	CROP	N	P	K	TILLAGE	YEILD GOAL
3	CORN	114	115	185	moldboard	10-15 ton
4-0	CORN	114	115	185	moldboard	10-15 ton
4-1	GRASS	50	75	125	n/a	2-3 ton
5	PASTURE	32	32	65	n/a	1-2 ton
6	CORN	114	115	185	moldboard	10-15 ton
7-0	PASTURE	1,755	1,755	3,510	n/a	1-2 ton
7-1	PASTURE	495	495	990	n/a	1-2 ton
8	PASTURE	102	102	204	n/a	1-2 ton

Note: Spread manure was estimated at a dry matter content between 11-20%, and pasture manure was estimated at >20% dry matter.

7. Potentially Tradeable Phosphorus under Current Management. SnapPlus Modeling will be used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model 8 fields under current management practices. The current management, crops and nutrient applications will be modeled out to 2022, to create a baseline, to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. **The 2022 PTP is considered to be permanent baseline.** 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
- Nutrient Management Report
- Spreading and Nutrient Management Sorted By Crop

- Producers Plan Report
- Phosphorous Trade Report

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022
3	FREEON	757B	10	285	285	287	289	292
4-0	FREEON	757B	19	328	474	502	520	525
4-1	FREEON	757B	8	16	15	15	16	16
5	FREEON	757B	11	7	7	7	7	8
6	MAGNOR	3456A	16	250	249	251	232	237
7-0	FREEON	757B	0	5	5	6	6	6
7-1	FREEON	757B	1	15	15	15	16	16
8	FREEON	757B	3	8	8	8	8	9
Total			**68**	**914**	**1,059**	**1,092**	**1,094**	**1,109**

D. PROPOSED OPERATING CONDITONS OF THE FARM:

After the Water Quality Trading Plan has been approved by the DNR and accepted by the Village of Hawkins, the farm will be purchased from the Olson's and deeded to the Village of Hawkins. The Village has a signed purchase agreement in place, refer to Appendix J. The dairy herd will leave with the Olson's; so will the need for the home, farm buildings, and barnyard. All buildings and impervious surfaces will be demolished. The entire farm, including: former building sites, farm roads, cropland and pastures will be seeded to permanent grass cover. The only exception may be approximately 2 acres of non-farmland located adjacent to the existing well and septic system that may be reserved for a future building site.

1. **Nutrient Management.** The farm will be managed to draw down the phosphorus levels in fields testing at excessively high levels based upon the UW soil tests. This will be done by removing the grass hay crop without replacing the nutrients. The nutrients will be drawn down to the optimum level on the soil test. After which point in time, the farm operator will be allowed to fertilize in order to maintain the optimum nutrient levels on the soil test.

2. **Soil Sampling.** Soil sampling will be conducted 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 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 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 refer to UW Extension A2809.

3. **Cropping.** Fields 3, 4-0, 4-1, 5, 6, 7-0, 7-1 and the non-wooded portion of field 8 will be cropped as follows.
    a. **Seeding year 2018**
        - **Burn Down.** Pasture lands and cropland 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.
        - **Soil preparation.** The fields will be chisel plowed, disked/cultivated and finished by not less than 2 passes to prepare a smooth seedbed.

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

30%	Perennial Ryegrass
20%	Fawn Tall Forage Fescue
20%	Timothy
30%	Reed Canarygrass

- **Nurse Crop.** 1 ½ bushel per acre of oats will be seeded with the grass mix, as a conservation practice to reduce sediments leaving the field. Oats are a cool season annual grass that will provide ground cover.
- **Seed Placement.** Seed will be sown using either a grain drill with two seed compartments or by a Brillion type seeder. Upon final seed placement a single pass shall be made with a large smooth drum roller.
- Nurse crop will be taken off as oatlage or harvested as grain at maturity

b. Year 2019-2022 (and in perpetuity)

- **Grass Hay.** Will be harvested by a local farmer and removed from the property upon harvest.

4. **Corrective Measures:** Prior to seeding in the spring of 2018, the Village of Hawkins will complete the following corrective measures to the existing farm:
   - Raze the existing farmstead improvements. All debris will be removed from the site or buried as permitted by law. The ground will be levelled, covered with topsoil, tilled and seeded. The former building sites will be converted to permanent grass.
   - The interior fences and debris on the farm will be removed so that there will be no obstructions to harvesting.
   - All debris and rock piles in the existing drainage way will be removed. The drainage way will be restored using NRCS design standards.
   - The existing farm road will be obliterated and become part of the permanent grass cover.
   - The existing stream crossing will be upgraded to a rock ford.
   - All fields shall receive 4 ton per acre of lime prior to soil preparation

5. **Potentially Tradeable Phosphorus (Permanent grass)**

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2018	2019	2020	2021	2022
3	FREEON	757B	10	57	10	7	5	4
4-0	FREEON	757B	19	64	15	10	7	6
4-1	FREEON	757B	8	5	5	4	3	3
5	FREEON	757B	11	7	4	3	2	1
6	MAGNOR	3456A	16	39	7	4	3	2
7-0	FREEON	757B	0	3	3	2	2	2
7-1	FREEON	757B	1	9	3	2	2	2
8	FREEON	757B	3	8	5	4	3	3
Total			68	191	52	37	27	23

There is an existing waterway that runs along the east side of the farm road. Currently there is manure in the waterway along with rock and debris. The waterway will be restored according to NRCS waterway design standards.

The exiting farm road is eroded and rutted. The farm road will be restored and converted into part of the farm fields.

The existing farm road crosses the unnamed waterway in an unimproved fashion. This crossing has eroded and grown to be about 200 hundred feet long and 1 ½ feet deep. The crossing will be corrected and stabilized. Work will be coordinated with the DNR to construct a stable rock ford.

E. TRADEABLE PHOSPHORUS

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. **Trade Ratio Factors**
    - **Delivery** - N/A Credit generator and user within same HUC-12
    - **Downstream** - N/A Credit generator is upstream of credit user, see Attachment D
    - **Equivalency** - N/A for Phosphorus
    - **Uncertainty** - Whole Field Management 1:1 per. Table 16, Pg. 57 of A WQT How To Manual WI DNR
    - **Habitat Adjustment** - N/A no habitat work

    The sum of the Trade ratio factors yields a 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: trade ratio will be applied between the Olson Farm and the Village of Hawkins WWTF.**

2. **Phosphorus Credit Generation.** Credits are calculated as the difference between phosphorus lost under current baseline practices and phosphorus lost under the proposed practices. The credits are calculated on an annual basis. The tables below show the trade rates per field beginning in 2018 and extending to 2022. Note: the following phosphorous losses are not included in the Tradeable Phosphorus calculations:
    - Gulley erosion from the farm road
    - Losses resulting from existing manure piles
    - Losses resulting from current manure handling practices

3. Tradeable Phosphorus

Tradeable Phosphorus 2018				
Field	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
3	285	57	228	190
4-0	328	64	264	220
4-1	16	5	11	9
5	7	7	0	0
6	250	39	211	176
7-0	5	3	2	2
7-1	15	9	6	5
8	8	8	0	0
Total	**914**	**192**	**722**	**602**

Tradeable Phosphorus 2019				
Field	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
3	285	10	275	229
4-0	474	15	459	383
4-1	15	5	10	8
5	7	4	3	3
6	249	7	242	202
7-0	5	3	2	2
7-1	15	3	12	10
8	8	5	3	3
Total	**1058**	**52**	**1006**	**838**

Tradeable Phosphorus 2020				
Field	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
3	287	7	280	233
4-0	502	10	492	410
4-1	15	4	11	9
5	7	3	4	3
6	251	4	247	206
7-0	6	2	4	3
7-1	15	2	13	11
8	8	4	4	3
Total	**1091**	**36**	**1055**	**879**

Tradeable Phosphorus 2021				
Field	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
3	289	5	284	237
4-0	520	7	513	428
4-1	16	3	13	11
5	7	2	5	4
6	232	3	229	191
7-0	6	2	4	3
7-1	16	2	14	12
8	8	3	5	4
Total	**1094**	**27**	**1067**	**889**

Tradeable Phosphorus 2022				
Field	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
3	292	4	288	240
4-0	525	6	519	433
4-1	16	3	13	11
5	8	1	7	6
6	237	2	235	196
7-0	6	2	4	3
7-1	16	2	14	12
8	9	3	6	5
Total	**1109**	**23**	**1086**	**905**

Summary of Tradeable Phosphorus from 2018 through 2022				
Year	CURRENT PRACTICES PTP	PERMANENT GRASS HAY PTP	TRADEABLE PHOSPHORUS W/O TRADE RATIO	TRADE RATIO APPLIED 1.2:1
2018	**914**	**192**	**722**	**602**
2019	**1058**	**52**	**1006**	**838**
2020	**1091**	**36**	**1059**	**879**
2021	**1094**	**27**	**1067**	**889**
2022	**1109**	**23**	**1086**	**905**

Tradeable phosphorous in years 2023 and beyond will be based upon the 2022 Total Tradeable Phosphorus w/o Trade Ratio of 1086 pounds per year.

F. REPORTING

1. Management Practice Registration

Submit the following to the DNR to register that the management practices have been installed (2018):

- Date of land purchase
- Date corrective measures have been completed
- Date of seeding
- Date of 90% ground cover and photo verification
- Date of nurse crop harvest
- Date and photos of permanent seeding upon regrowth
- 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

2. Monthly Reporting. Each month the Village 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.**

3. Annual Reporting. The Village 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
- Any application of nutrients and a copy of the soil test recommending that application
- At least 1 photo of the permanent vegetative cover, indicating condition
- A summary of credits used each month over the calendar year

4. Notification of Problems with Permanent Grass Cover. The Village shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the Village are not being generated as approved in the WQT plan. The Village will work to restore the vegetative cover and update the DNR on the progress.

G. DNR RIGHT OF ENTRY

The Village of Hawkins grants to the DNR the Right to inspect the permanent grass cover management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented.

H. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLSIT

This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 8, page 37 of Guidance for Implementing Water Quality Trading Plans, Guidance No: 3800-2013-04; Form 3400-208 is included as Attachment G. 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 0024201-09-1

• **Permittee's/credit users contact information:**	Janice Krings, Village Clerk Village of Hawkins P.O. Box 108 509 Main Street Hawkins, WI 54530 Phone 715-585-6322
• **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 Summary Table page 11
• **Certification that the content of the trading application is accurate and correct.**	See Section J, page 14
• **Signature and date of signature of permittee's/ credit users authorized representative:**	See Section J, page 14
• **Location where credits will be generated:**	See Attachment B and E
• **Identification of methods including management practices that will be used to generate credits:**	See Section D, page 6
• **Duration of agreement with each credit generator:**	Permanent, unless the WPDES removes the phosphorous requirement
• **Schedule for installation/construction of each management practice:**	See Section D, page 6
• **Operation and Maintenance plan for each management practice,**	See Attachment I
• **Date when credits become available for each management practice:**	Upon successful seeding estimated at July, 2018
• **Models used to derive the amount of credits:**	SnapPlus, see Attachment C
• **The applicable trade ratio for each management practice including supporting technical basis:**	See section E-1.

I. Summary of Phosphorus Trading

Following is a summary of the phosphorus credits being generated by the conversion of the Olson Farm to permanent grass and the estimated credits required by the Hawkins WWTF.

SUMMARY OF PHOSPHORUS TRADING				
YEAR	**CREDITS GENERATED BY OLSON FARM**	**LBS. OF PHOS. REQD. TO BE MITIGATED FOR HAWKINS WWTF**	**PHOS. CREDITS REQD. AT A TRADING RATIO OF 1.2:1**	**EXCESS PHOS. CREDITS TO BE SOLD**
2018	**722**	**333**	**400**	**322**
2019	**1006**	**333**	**400**	**606**
2020	**1059**	**333**	**400**	**659**
2021	**1067**	**333**	**400**	**667**
2022 and beyond	**1086**	**333**	**400**	**686**

Note: The WPDES phosphorus limit is 0.124 mg/l which equals approximately 22 pounds per year. The actual phosphorus discharged per year varies from 9 to 355 pounds with an average of 117. Pounds of phosphorus to be mitigated is based upon the maximum year of 355 pounds minus the allowable discharge of 22 pounds equals 333 pounds. This provides a safety factor of 3.5 for the 10 year average phosphorus discharge of 117 pounds.

J. **Certification 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.

Village of Hawkins:

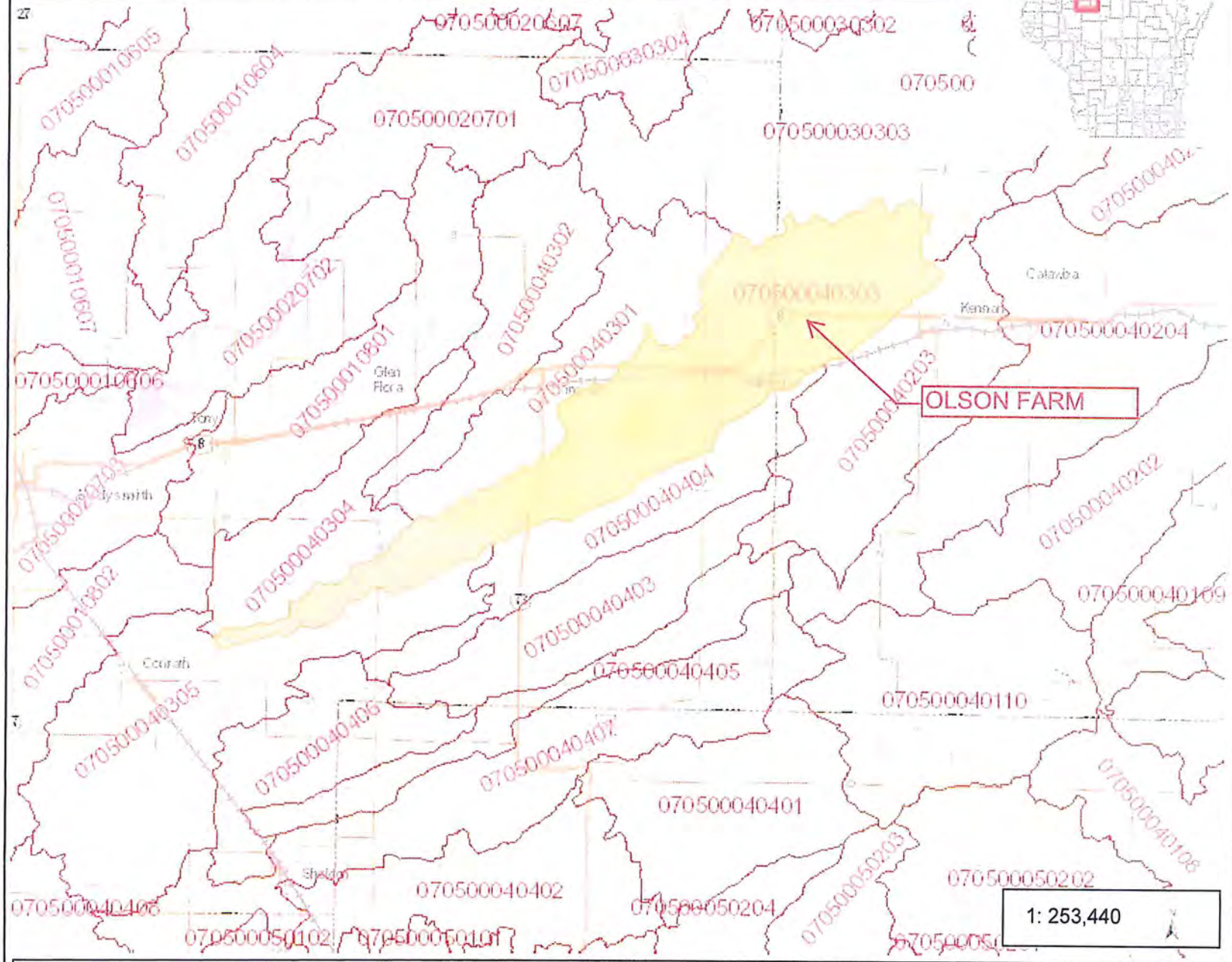
Janice Krings, Village Clerk

Project Engineer:

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

APPENDIXES

Surface Water Data Viewer Map



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

1: 253,440

8.0 0 4.00 8.0 Miles

NAD_1983_HARN_Wisconsin_TM

ATTACHMENT A HUC 12

Notes

Hawkins WWTF HUC -12


ATTACHMENT B
OLSON FARM
PERENNIAL WATER
022104003000
022104005000
022104005010
022104009000
022104010000
022104108000
022104107000
022104103000
022104102000
022104109000
022104110000
022104202000
022104201000
PRICE RD
8
6
7
N
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.

SnapPlus Narrative and Crops Report

Starting Year 2016

Reported For Hawkins

Printed 2017-10-10

Plan Completion/Update Date: 2017-01-25

SnapPlus Version 16.3 built on 2016-10-31

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Prepared for:
Hawkins
attn:Hawkins
509 Main St
Hawkins, 54530

Farm has 8 fields totalling 68 acres
Farm Narrative: None
Concentrated Flow Notes: None

3	9.8	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre
4-0	19.2	Grass hay None 2-3 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre
4-1	7.7	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre	Grass hay None 2-3 ton/acre
5	10.7	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre
6	16.3	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre	Corn silage Spring MB Plow 10-15 ton/acre

APPENDIX C

Field Name	Acres	2016	2017	2018	2019	2020	2021	2022
7-0	0.2	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre
7-1	0.7	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre	Pasture, continuous stocking, high density None 1-2 ton/acre
8	3.4	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre	Pasture, continuous stocking, low density None 1-2 ton/acre

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
Corn silage	Acres	26	45	45	45	45	45	45
	ton	325	563	563	563	563	563	563
Grass hay	Acres	27	8	8	8	8	8	8
	ton	68	20	20	20	20	20	20
Pasture, continuous stocking, low density	Acres	14	14	14	14	14	14	14
	ton	21	21	21	21	21	21	21
Pasture, continuous stocking, high density	Acres	1	1	1	1	1	1	1
	ton	2	2	2	2	2	2	2

SnapPlus Soil Test Report

Reported For **Hawkins**

Printed **2017-10-10**

Plan Completion/Update Date **2017-01-25**

SnapPlus Version 16.3 built on 2016-10-31

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Prepared for:
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attn:Hawkins
509 Main St
Hawkins, 54530

			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
3		9.8	757B	FREEON	2016-11-08	Soil & Forage Analysis Lab	6830	2	2	5.8	5.2	78	211	0	0
4-0		19.2	757B	FREEON	2016-11-15			4	1	5.8	4.9	54	133	0	0
4-1		7.7	757B	FREEON	2016-11-15			2	1	5.8	4.9	54	133	0	0
5		10.7	757B	FREEON	2016-11-08	Soil & Forage Analysis Lab	6830	2	4	5.3	4.3	20	68	0	0
6		16.3	3456A	MAGNOR	2017-03-31	Soil & Forage Analysis Lab	1668	3	4	5.6	4.4	21	81	0	0
7-0		0.2	757B	FREEON	2017-10-02	Soil & Forage Analysis Lab	5496	1	1	8.0	11.4	371	1185	0	0
7-1		0.7	757B	FREEON	2017-10-02	Soil & Forage Analysis Lab	5496	1	1	8.0	11.4	371	1185	0	0
8		3.4	757B	FREEON	2017-10-02	Soil & Forage Analysis Lab	5496	1	1	6.2	8.9	142	345	0	0

Crop Year Soil Test Needed

Field Name	Soil Test Date	2016	2017	2018	2019	2020	2021	2022
3	2016-11-08						X	
4-0	2016-11-15						X	

Field Name	Soil Test Date	2016	2017	2018	2019	2020	2021	2022
4-1	2016-11-15						X	
5	2016-11-08						X	
6	2017-03-31						X	
7-0	2017-10-02							X
7-1	2017-10-02							X
8	2017-10-02							X

SnapPlus Application Summary Report

Starting Year 2016

Reported For Hawkins

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Hawkins, 54530

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 Grazing	Production (Tons)	0	0	0	0	0	0	0
	Used (Tons)	0	464	464	464	464	464	464
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6
	Dry Matter (%)	13	13	13	13	13	13	13
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Semi-Solid	Production (Tons)	0	0	1,237	0	0	0	0
	Used (Tons)	193	1,325	1,325	1,325	1,325	1,325	1,325
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5
	Dry Matter (%)	15	15	15	15	15	15	15
	Total Value	0.00	0.00	1,237.00	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.

		2016	2017	2018	2019	2020	2021	2022
Produced from Manure (lb)	Ninj	0	0	3,711	0	0	0	0
	P2O5	0	0	3,711	0	0	0	0
	K2O	0	0	6,185	0	0	0	0
Total Available Manure Nutrients Applied (lb)	N	385	4,037	4,037	4,037	4,037	4,037	4,037
	P2O5	578	5,362	5,362	5,362	5,362	5,362	5,362
	K2O	963	9,409	9,409	9,409	9,409	9,409	9,409
Total Fertilizer Nutrients Applied (lb)	N	444	2,899	2,899	2,899	2,899	2,899	2,899
	P2O5	1,001	1,812	1,812	1,812	1,812	1,812	1,812
	K2O	1,515	2,718	2,718	2,718	2,718	2,718	2,718
Total Crop Removal (lb)	P2O5	2,626	2,722	2,722	2,722	2,722	2,722	2,722
	K2O	7,332	6,660	6,660	6,660	6,660	6,660	6,660
Nutrient Balance (Applied - Crop removal, lb)	P2O5	-1,047	4,452	4,452	4,452	4,452	4,452	4,452
	K2O	-4,854	5,468	5,468	5,468	5,468	5,468	5,468

SnapPlus Manure Tracking Report

Starting Year 2016

Reported For Hawkins

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Prepared for:
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Hawkins, 54530

Acres/ Crop Year	2016	2017	2018	2019	2020	2021	2022
Acres in plan	68.0	68.0	68.0	68.0	68.0	68.0	68.0
Acres receiving manure	7.7	53.0	53.0	53.0	53.0	53.0	53.0

Annual Manure Production And Use By Source

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

Source		2016	2017	2018	2019	2020	2021	2022
Dairy Grazing	Production (Tons)	0	0	0	0	0	0	0
	Used (Tons)	0	464	464	464	464	464	464
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6	3/0/0-3-6
	Dry Matter (%)	13	13	13	13	13	13	13
	Total Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy Semi-Solid	Production (Tons)	0	0	1,237	0	0	0	0
	Used (Tons)	193	1,325	1,325	1,325	1,325	1,325	1,325
	Analysis Date	-	-	-	-	-	-	-
	Analysis (N/Ninc/Ninj-P2O5-K2O)	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5	2/2/3-3-5
	Dry Matter (%)	15	15	15	15	15	15	15
	Total Value	0.00	0.00	1,237.00	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 1200 lbs			7	365	100	0	162	0
Dairy Calf 250 lbs			10	365	0	0	0	0
Dairy Dry Cows 1200 lbs			7	365	0	0	0	0
Dairy Heifer 1000 lbs			7	365	0	0	0	0
Dairy Heifer 750 lbs			10	365	0	0	0	0
Dairy Youngstock 500 lbs			10	365	0	0	0	0
Dairy Lactating Cows 1400 lbs			43	365	100	0	1,161	0
						Farm Totals	1,323	0

Manure Storage For 2018

No Storages Found

Spreaders For 2018

No Spreaders Found

SnapPlus Field Data and 590 Assessment Plan

Reported For **Hawkins**

Printed **2017-10-10**

Plan Completion/Update Date **2017-01-25**

SnapPlus Version 16.3 built on 2016-10-31

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Prepared for:
Hawkins
attn:Hawkins
509 Main St
Hawkins, 54530

Field Data: 68 Total Acres Reported.

Field Name	Sub Farm	FSA Tract	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
3				9.8	Price	FREEON 757B	4	150	0 - 2	0 - 300	S	No / No	No	No	Csl	SP	2021-2021	4	9.6	-0.7	29	78	70	0
4-0				19.2	Price	FREEON 757B	4	150	0 - 2	0 - 300	S	No / No	No	No	Csl	SP	2021-2021	4	9.6	-0.7	27	54	70	0
4-1				7.7	Price	FREEON 757B	4	150	0 - 2	0 - 300	S	No / No	No	No	GH	None	2021-2021	4	0	1.7	2	54	35	0
5				10.7	Price	FREEON 757B	4	150	0 - 2	0 - 300	S	No / No	No	No	Pcl	None	2016-2016	4	0.1	1.8	0	20	0	-
6				16.3	Price	MAGNOR 3456A	2	250	0 - 2	0 - 300	S	No / No	No	No	Csl	SP	2016-2016	4	5.5	-0.5	8	21	0	-
7-0				0.2	Price	FREEON 757B	4	150	0 - 2	301 - 1000		No / No	No	No	Pu-Pu-Pu-Pu	None-None-None-None	2016-2019	4	0.6	1.5	20	371	5165	-25
7-1				0.7	Price	FREEON 757B	4	150	0 - 2	301 - 1000		No / No	No	No	Pu	None	2016-2016	4	1.1	1.0	12	371	-25	-6
8				3.4	Price	FREEON 757B	4	150	0 - 2	301 - 1000		No / No	No	No	Pcl	None	2016-2016	4	0.1	1.8	1	142	-25	-6

Crop Abbreviations

Abbreviation	Crop
Csl	Corn silage
GH	Grass hay
Pcl	Pasture, continuous stocking, low density
Pu	Pasture, continuous stocking, high density

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 200 feet upslope of field.
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.

SnapPlus Nutrient Management Report

Crop Year 2016

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Prepared for:
Hawkins
attn:Hawkins
509 Main St
Hawkins, 54530

Field data: 68 total acres reported.

Field Data			Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions	Avg P	Avg K	2015 Crop	2016 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
3	9.8	FREEON 757B	78	211	missing	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	25	0	0	0	-145	0	-25
4-0	19.2	FREEON 757B	54	133	missing	Grass hay	2-3	None	130	0	70	0	0	0	-130	0	-70
4-1	7.7	FREEON 757B	54	133	missing	Grass hay	2-3	None	130	0	70	50	75	125	-80	75	55
5	10.7	FREEON 757B	20	68	missing	Pasture, continuous stocking, low density	1-2	None	100	25	100	11	25	38	-89	0	-62
6	16.3	MAGNOR 3456A	21	81	missing	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	45	160	20	45	68	-125	0	-92
7-0	0.2	FREEON 757B	371	1185	missing	Pasture, continuous stocking, high density	1-2	None	70	0	0	0	0	0	-70	0	0
7-1	0.7	FREEON 757B	371	1185	missing	Pasture, continuous stocking, high density	1-2	None	70	0	0	0	0	0	-70	0	0
8	3.4	FREEON 757B	142	345	missing	Pasture, continuous stocking, low density	1-2	None	100	0	0	0	0	0	-100	0	0

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 200 feet upslope of field.
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.

SnapPlus Nutrient Management Report

Crop Year 2017

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Prepared for:
Hawkins
attn:Hawkins
509 Main St
Hawkins, 54530

Field data: 68 total acres reported.

Field Data				Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions		Avg P	Avg K	2016 Crop	2017 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
3	9.8	FREEON	757B	78	211	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	25	114	115	185	-31	115	160
4-0	19.2	FREEON	757B	54	133	Grass hay	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	105	114	115	185	-31	115	80
4-1	7.7	FREEON	757B	54	133	Grass hay	Grass hay	2-3	None	130	0	15	70	75	125	-60	75	110
5	10.7	FREEON	757B	20	68	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	25	100	32	32	65	-68	7	-35
6	16.3	MAGNOR	3456A	21	81	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	45	160	114	115	185	-31	70	25
7-0	0.2	FREEON	757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	1755	1755	3510	1685	1755	3510
7-1	0.7	FREEON	757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	495	495	990	425	495	990

Hawkins

SnapPlus Nutrient Management Report

10/10/2017

Field Data			Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions	Avg P	Avg K	2016 Crop	2017 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
8	3.4	FREEON 757B	142	345	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	0	0	102	102	204	2	102	204

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 200 feet upslope of field.
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.

SnapPlus Nutrient Management Report

Crop Year 2018

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Prepared for:
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attn:Hawkins
509 Main St
Hawkins, 54530

Field data: 68 total acres reported.

Field Data			Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions	Avg P	Avg K	2017 Crop	2018 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
3	9.8	FREEON 757B	78	211	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	0	134	115	185	-11	115	185
4-0	19.2	FREEON 757B	54	133	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	25	134	115	185	-11	115	160
4-1	7.7	FREEON 757B	54	133	Grass hay	Grass hay	2-3	None	130	0	0	80	75	125	-50	75	125
5	10.7	FREEON 757B	20	68	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	18	100	43	32	65	-57	14	-35
6	16.3	MAGNOR 3456A	21	81	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	135	134	115	185	-11	115	50
7-0	0.2	FREEON 757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	2340	1755	3510	2270	1755	3510
7-1	0.7	FREEON 757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	660	495	990	590	495	990

Field Data			Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions	Avg P	Avg K	2017 Crop	2018 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
8	3.4	FREEON 757B	142	345	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	0	0	136	102	204	36	102	204

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 200 feet upslope of field.
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.

SnapPlus Nutrient Management Report

Crop Year 2019

Reported For Hawkins

Printed 2017-10-10

Plan Completion/Update Date 2017-01-25

SnapPlus Version 16.3 built on 2016-10-31

M:\M Drive\2012\2012-180 Hawkins Facility Plan, Phos. Operational Evaluation Report\snap plus\snap plus from county\Entire farm snapplus \Hawkins.snapDb

Prepared for:
Hawkins
attn:Hawkins
509 Main St
Hawkins, 54530

Field data: 68 total acres reported.

Field Data				Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions		Avg P	Avg K	2019 Crop	2019 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
3	9.8	FREEON	757B	78	211	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	0	144	115	185	-1	115	185
4-0	19.2	FREEON	757B	54	133	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	0	144	115	185	-1	115	185
4-1	7.7	FREEON	757B	54	133	Grass hay	Grass hay	2-3	None	130	0	0	80	75	125	-50	75	125
5	10.7	FREEON	757B	20	68	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	11	100	48	32	65	-52	21	-35
6	16.3	MAGNOR	3456A	21	81	Corn silage	Corn silage	10-15	Spring MB Plow	145 0.05 /MRTN	0	110	144	115	185	-1	115	75
7-0	0.2	FREEON	757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	2633	1755	3510	2563	1755	3510
7-1	0.7	FREEON	757B	371	1185	Pasture, continuous stocking, high density	Pasture, continuous stocking, high density	1-2	None	70	0	0	743	495	990	673	495	990

Field Data			Soil Test ppm		Crop Data				Recommendations			Planned Applications and Credits			Over(+)/Under(-) UW Recs		
Field Name	Ac	Predominant Soil and N Restrictions	Avg P	Avg K	2018 Crop	2019 Crop	Yield Goal	Tillage	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac	N lb/ac	P2O5 lb/ac	K2O lb/ac
8	3.4	FREEON 757B	142	345	Pasture, continuous stocking, low density	Pasture, continuous stocking, low density	1-2	None	100	0	0	153	102	204	53	102	204

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 200 feet upslope of field.
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%	Slope restriction for winter applications
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