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# 2nd Bulletin of the Minnesota Agriculture Water Quality Certification Program and Assessment Tool

May 2014

What's in this bulletin?

1. Soil hydrologic group and tile drainage
2. Irrigation scoring
3. Alternative scoring practice: manure P rate and application
4. Landowner certification eligibility
5. Shoreland buffers



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## Preface

The information provided in these Bulletins is intended to be complementary to the handouts and Technical Guides, the first of which was published September 2013. If major modifications are made to the Assessment Tool, a new Technical Guide will be published at that time and the previous version retired. Bulletins, however, are cumulative and can be used as references going forward.

As this is a pilot program, procedural and technical positions presented in this bulletin are adapting to the findings of the program. New participants and certifiers using the MAWQCP Assessment Tool are encouraged to consult the Bulletins and latest version of Technical Guides.

## 1 Technical Positions

### ***What do I do if a field's predominant hydrologic soil group is a dual designation such as B/D or C/D?***

The dual designation is for soil units that have different properties when in drained versus undrained conditions. If the field you are working with is well-drained by artificial means, such as drain tile, there will be less surface flow of water and, as a result, less erosion. In these situations, the lesser designation (i.e., A,B or C) is the proper hydrologic group to use in

completing the assessment. If the field is not artificially drained, the more erodible designation of D would be the hydrologic group that you would want to choose.

### ***What are the alternative scoring practices available for manure-derived P?***

In areas with high native levels of soil test phosphorus or long histories of manure application, producers using manure are by default scored as having a high risk to water quality, regardless of their management practices.

University of Minnesota studies show that there is little crop response to additional P application once soil test phosphorus (STP) levels are >21 ppm Bray P1. Therefore, no additional P is recommended once STP reaches this level. For producers who have STP levels greater than 21 ppm and apply livestock manure to meet nitrogen needs, the current scoring schedule would place them at '50% or greater' as *any* P applied is greater than the crop response recommendation.

This scoring does not necessarily align with water quality risk as it assumes all P applied greater than crop response rate is lost to the environment. This ignores the soil's sorption potential. To more accurately measure the risk of P loss, over 40 states, including Minnesota, have adopted the Phosphorus Index concept. This concept examines the risk of soluble and insoluble P to water quality as it relates to a host of parameters, including slope, runoff timing and buffers. The index concept also takes

into consideration existing STP levels.

The concepts in the index approach have also been incorporated into the regulatory Minnesota Pollution Control Agency (MPCA) 70.20 rules and the non-regulatory Natural Resource Conservation Service (NRCS) 590 Nutrient Management standards. Basic principles are as follows. 1) As STP levels increase the risk of P loss to the environment increases. 2) Vegetative buffers are instrumental in reducing P loss. 3) The ability of the harvested crop to remove phosphorus removal rates should be considered.

To comprehensively address these issues and align the program with regulatory and voluntary practices, alternative scoring for P manure is proposed. A summarized table is presented below:

STP Levels Bray P1 (ppm)	STP Levels Olsen (ppm)	Buffer*			No buffer		
		application =crop response rate	crop response< application ≤P205 removal**	application >P205 removal	application =crop response	crop response< application ≤P205 removal	application >P205 removal
<21	<16	10	9	1	10	8	1
22-75	17-60	n/a	7	1	n/a	6	1
76-150	61-120	n/a	5	1	n/a	4	1
>150	>120	n/a	1	1	n/a	1	1
>150	>120	n/a	1	1	n/a	1	1
Sheet and rill erosions >6 tons acre-1 year-1		1	1	1	1	1	1

\*non-manured permanent vegetation strip that is min. 100 feet wide. \*\*P205 removal is defined as manure application rates that are based on the ability of the crop to remove P205 over the course of the cropping year or rotation not to exceed 6 years.

To determine the score, locate the STP level along the left side of the table. Both Olsen and Bray tests are presented. Next, determine if there is a buffer present along waterway or area of concentrated flow. Lastly, determine if the actual P application rate (denoted as ‘application’) corresponds to the crop response rate or if it is above/below the crop’s ability to remove phosphate over the rotation.

For example, a producer’s soil test shows STP levels based on the Bray P1 test of 50 ppm. The producer has a functional 100’ wide buffer of permanent vegetation along a stream. Upon review of the manure lab tests and the manure application plan, it is determined that producer’s actual phosphate rate is below crop P205 removal rate across a four-year rotation. This score in this case would be 7.

***What is 'sprinkler vs 'center pivot' irrigation and why is scoring different between the two?***

Sprinkler irrigation, also known as a traveling gun system, consists of a sprinkler gun mounted on a wheeled cart. Center pivot is a self-propelled tower system nozzles that rotates around a central pivot point.

The difference in scoring between the traveling gun and center pivot is largely tied to area covered and amount of water delivered.

In many situations, traveling guns are delivering irrigation water at lower flow rates than center pivots. Consider two adjoining fields: a 60 acre field with a traveling gun system delivering water at 120 gpm and a 130 acre field with a center pivot delivering water at 780 gpm. In both fields, the goal of the irrigation event is to deliver 1.5 acre-inches or just under 41,000 gallons per acre. A single, random acre in the field with the traveling gun system would take over five hours to receive the targeted amount of water. Whereas a single, random acre in the field with the center pivot system could receive that amount in as little as one hour (depending upon where that acre is in relation to the center pivot's orientation). If a rain event occurs during irrigation, a larger portion of the acre under center pivot irrigation would be at field capacity and thus, more susceptible to runoff.

In addition to the temporal issue, there is also a spatial consideration. Consider again the two adjoining fields with the different irrigation systems. Under both systems, it would take just under 5 days of continuous irrigation to deliver the target 1.5 acre-inches. Let's say on the final day of the irrigation schedule, a rain event occurs and causes runoff on the portions of the field at field capacity. About 20% of each field is at field capacity, or 6 and 13 acres for the traveling gun and center pivot fields, respectively. The potential yield of sediment or nutrients is greater from the larger field with the larger irrigation equipment.

While the two systems often have a disproportionate risk in terms of water quality, both systems could benefit from irrigation scheduling. NRCS CP449 Irrigation Water Management is one tool to accomplish this. Under this program producers use evapotranspiration rates, growing-degree days and/or soil sensors to determine water needs. It is available under the EQIP Ag Certainty pool and can help control pumping costs while maintaining optimal crop water availability.

In terms of scoring, producers utilizing irrigation scheduling, including traveling guns, under CP449 are eligible for the lower (-1.5%) adjustment. Future versions of the tool will incorporate this change.

***The application form asks producers to self-certify that they are in compliance with MPCA 70.20 rules, what regulations does this include?***

MPCA 70.20 rules relate to livestock feedlots and manure application. While some operations may need a specific permit, all producers applying manure to soil need to comply with the rules. For the certifiers convenience, attached is a list of the rules organized by major feature. All those designated in with an ‘R’ are regulatory while those designated with a ‘V’ are voluntary. This reference table was adapted from the MPCA’s *Applying Manure in Sensitive Areas* publication.

Features	Non-winter application	Winter applications (frozen, snow covered or actively thawing)
All fields with manure application	R: Do not apply manure at rates that exceed crop N needs. R: Obtain all necessary NPDES, State Disposal System, interim or construction short form permits which may be more restrictive than practices presented in this table.	
Surface waters- Streams, wetlands, drainage ditches, lakes, streams	<p style="text-align: center;"><i>Without a filter strip</i></p> R: within 25 feet of surface waters- do not apply R: within 25-300 feet of surface waters- inject/incorporate manure within 24 hours R: within 25-300 feet of surface waters- if STP exceeds 21 ppm Bray p1 or 16 ppm Olsen apply manure at or below P removal rates	R: within 300 feet- do not apply
	<p style="text-align: center;"><i>With a filter strip</i></p> R: if buffer of 100 feet around lakes and streams or 50 feet wide around intermittent streams, wetlands, drainage ditches- exempt from 300’ incorporation/inject requirement V: inject and incorporate even if a buffer is present.	
	<p style="text-align: center;"><i>With or without a filter strip</i></p> R: Intermittent streams that are maintained as in-field grass waterways for erosion control are excluded from manure application requirements. R: Drainage ditches with earthen berms and NO side inlets are excluded from manure application requirements V: incorporate/inject AND apply manure at or below P removal rates on all lands that slope toward surface waters.	

Features	Non-winter application	Winter applications (frozen, snow covered or actively thawing)
Open tile intakes	R: within 300 feet- inject/incorporate within 24 hours V: sloping land toward intake- inject/incorporate immediately AND apply manure at or below P removal rates.	R: within 300 feet- do not apply
Wells and wellhead protection areas	R: within 50 feet- do not apply V: divert field runoff away from wells V: sloping land toward improperly sealed well- inject/incorporate manure V: wellhead protection area- fall manure application only on average daily soil temperatures at a six inch depth are below 50F	R: within 50 feet- do not apply
Quarries/Mines	R: within 50 feet- do not apply V: within 50-300 feet upslope, inject/incorporate within 24 hours of rainfall/runoff V: divert runoff waters from entering feature V: plant vegetative buffers around feature	R: within 50 feet- do not apply
Road ditches	R: no manure application V: use the same requirements and voluntary practices at surface water	R: no manure application
Sinkholes	R: within 50 feet- do not apply R: within 50-300 feet upslope- inject or immediately incorporate R: incorporation is not required if berms or diversions keep contaminated water from entering sinkhole V: divert field runoff from sinkholes V: plant vegetative filter strips upslope of sinkholes	R: within 50 feet downslope and 300 feet upslope- do not apply
Steeply sloping lands	V: do not apply manure on land where gully erosion is not controlled V: control sheet/rill erosion below 2-5 tons acre-1 yr-1	V: do not apply
Frequently flooded soils	V: do not apply during usual peak flooding periods V: immediately incorporate/inject when there is a risk of flooding	V: do not apply
High water tables (> 2 feet depth)	V: maximize separation (> 24") between manure and water table	
Shallow bedrock (<40 inches)	V: maximize separation (> 24") between manure and bedrock. V: do not fall apply until average daily soil temperatures at six inch depth are below 50F	

Features	Non-winter application	Winter applications (frozen, snow covered or actively thawing)
Coarse textured soils	V: do not fall apply until average daily soil temperatures at six inch depth are below 50F	
High P soils	R: within 300 feet of surface waters- STP >22 ppm Bray P1 or > 17 Olsen- apply manure at or below P removal rates. R: within 300 feet of surface waters AND 100/50 foot vegetative buffer- STP >76 ppm Bray P1 or > 60 Olsen-apply manure at or below P removal rates. V: STP >22 ppm Bray P1 or > 17 Olsen- apply manure at or below P removal rates V: STP >75 ppm Bray P1 or > 60 Olsen -do not apply manure every year. V: STP >150 ppm Bray P1 or > 120 Olsen do not apply manure V: use grain types and feed additives that reduce P in manure V: inject or incorporate manure within 24 hours and prior to rainfall V: plant field edge filter strips	

## 2 Procedural Positions

### ***Is a producer who rents out their farmland eligible for certification?***

Yes, producers who solely own the land yet retain the authority to act as a decision maker for the management of the land can obtain certification. Like all certified producers, all the eligible land in the operation must meet the certification requirements and they must verify that they meet current water quality standards.

For discussion purposes, producers who own the land, such as lessors, shall hereafter be referred to as ‘landowner-producer’. Producers who lease the land, such as lessees, will hereafter be referred to as ‘lessee-producer.’

Below are a few recommendations and reminders to help certifiers communicate the responsibilities of all parties involved.

Landowner-producers may want to highlight specific management practices they have committed to under the certification program in leases they sign with lessee-producers. For example, if a landowner-producer commits to following the BMPs for nitrogen fertilizer use, they may want to articulate in the lease the specific practices they committed to.

The obligation to retain records pertaining to certification on their land is with the landowner-producer. They may want to

take measures, such as keeping copies of fertilizer records, to ensure their fields are being managed the way they have committed to in certification. While a lessee producer may actually pay for and apply the fertilizer, the onus is on the landowner-producer.

The program benefits and obligations only apply to the certified producer. For example, in the situation where the landowner-producer is certified and the lessee-producer is not, regulatory certainty only applies to the entity and land under certification. A non-certified lessee-producer is not covered under the certification contract.

Like all certified producers, if a landowner-producer changes practices they have to update their certification records. Their local certifier can assist them.

While the process may seem overwhelming, remind landowner-producers that the certifier is there to assist them and it is good practice to keep records. They should know and understand what they have committed to and make sure it aligns with what is happening in the fields. Good communication and clear leases are a first step.

### ***Where can I find more information on the state water laws highlighted in the application form?***

The various water laws are managed by different state agencies and, in some instances, by the local county government units on behalf of the state. The following

table lists the agency responsible for administering and enforcing the laws. It is in the certifiers best interest to compile a short-list of local field office staff to assist when producers have specific questions. If you need help finding a point-person, the MAWQCP staff is happy to assist.

<b>Resource</b>	<b>Administrators</b>
Irrigation permits	Department of Natural Resources
Feedlots and manure including NPDES and SDS permits	Pollution Control Agency or in some cases, County government.
Wetland Conservation Act	County government and Board of Water and Soil Resources
Pesticide and fertilizer use, storage, handling and disposal	Department of Agriculture
Shoreland protection	County government
Septic systems	County government

***How do I approach field verification of the required Shoreland Management buffers?***

When producers apply for the program they must self-certify compliance with Shoreland Management rules and Drainage Law. These rules are administered by local government units (LGU) at the county level. What the rules require is that on agricultural lands adjacent to lakes, rivers and streams a 50 foot vegetated buffer be in place. Also on public ditches a 1 rod (16.5 feet) vegetated buffer be installed when newly constructed or when improvements

occur. There are exceptions to the 50 foot buffer rule. One is when a county has adopted a minimum buffer other than 50 feet and this has been approved by the DNR Commissioner. The other exception is when the area is covered by an approved Resource Management System (RMS) plan. A RMS plan by definition is a plan that covers all resource concerns in the planning unit. In almost all circumstances a proper RMS plan in an area subject to Shoreland Management rules would include a Filter Strip or Riparian Forest Buffer to address the surface water quality resource concern.

Consider the following scenarios:

An applicant is not in compliance and the field is without a buffer:

- they can decline Technical Assistance (TA) and Financial Assistance (FA) and install a buffer that meets the legal requirement thus becoming program eligible.

- they can elect to receive TA and possibly FA and install a buffer to the NRCS Filter Strip or Riparian Forest Buffer practice standard (this could be greater or less than 50 ft if the producer is given an RMS plan), thus becoming program eligible.

An applicant certifies they are in compliance and the buffer is in place:

- if the buffer meets the 50 foot requirement they are eligible for the program.

- if the buffer is less than 50 feet wide, the producer can decline TA and FA and widen

the buffer to 50 feet thus meeting compliance and be eligible for the program.

-if a required buffer is less than 50 feet and the producer elects to seek TA, the buffer will be designed to meet the NRCS practice standard. If this design is less than 50 feet wide, the resource concern is still determined to be treated and a RMS plan can be delivered to the producer that puts them in compliance. They are program eligible.

An applicant is in compliance according to the LGU with no buffer in place:

-This is the most difficult scenario since the program's intention is not to supersede the authority of the LGU. They would be eligible in terms of satisfying the Shoreland Management rules but likely not in terms of meeting the resource concern. The purpose of field verification is not just to verify compliance but to identify resource concerns pertaining to water quality and to provide conservation practices and management options to address those concerns. Any plan that deviates from the accepted norm of installing buffers adjacent to lakes, rivers and streams would need to be approved on a case by case basis.