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**RE:** **Evaluation of Wisconsin's Water Quality Compliance Programs for Clearinghouse Framework Considerations, Requirements and Constraints**

This K&A memorandum presents an evaluation of the state of Wisconsin's three major phosphorus implementation programs including Water Quality Trading (WQT), Adaptive Management (AM), and Multi-Discharger Variance (MDV) options in the context of a Wisconsin Clearinghouse framework to facilitate program transactions. This evaluation addresses two main topics: 1) the opportunities for a clearinghouse structure to facilitate each program; and 2) the potential requirements and/or constraints to a clearinghouse structure currently presented by these programs. The memo begins with a summary of each program, including information on program activity. Opportunities for a clearinghouse structure to potentially facilitate each program are presented in Section 2. Section 3 addresses potential policy, programmatic, and/or legal constraints that may impede the ability of a clearinghouse to facilitate each program.

The assessment of program activity used information provided by Michael Best Strategies to Newtrient and K&A on MDV projects, as well as information obtained from the Wisconsin Department of Natural Resources (WDNR) online map of current WQT and AM projects. In addition, the WDNR permit public notice website was reviewed for additional project documentation. One additional MDV project was found and included in the review.

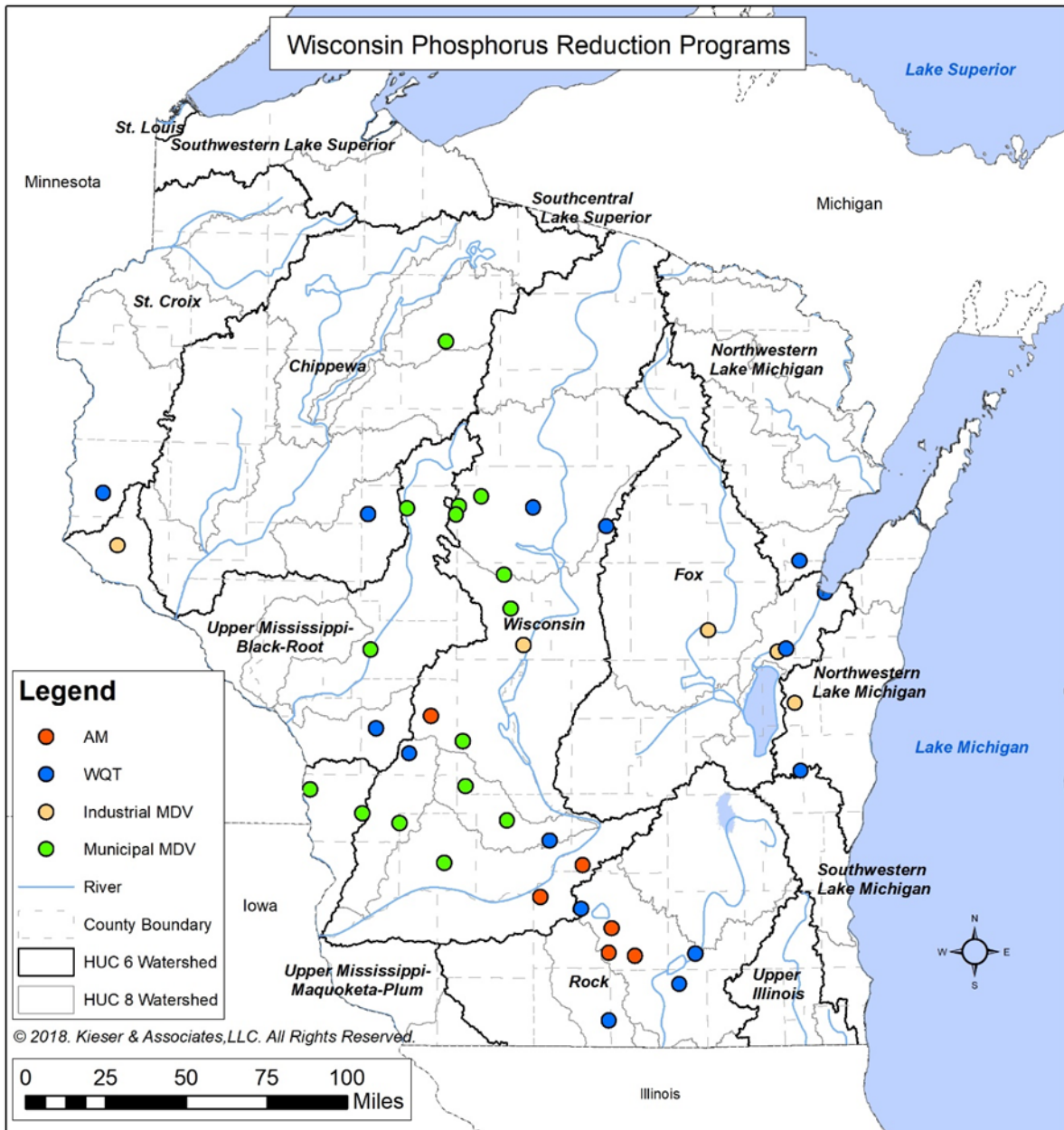
## **1.0 SUMMARY OF WISCONSIN PHOSPHORUS REDUCTION PROGRAMS**

This section summarizes each of the three Wisconsin programs with an introduction on each program's history and regulatory basis, activity to date, and challenges in the context of clearinghouse applications. A map of projects implemented and/or proposed under one of these three programs is provided as Figure 1.

### **1.1 Water Quality Trading**

Water quality trading is a regulatory compliance option for permitted dischargers to pay for other discharger reductions at a lower cost than more expensive treatment at their own point of discharge. Reductions from other sources must typically yield contemporaneous and equivalent (or greater) mass loading reductions of nutrients or sediments than the trading buyer's end-of-pipe, load reduction

requirements. Trading is currently guided by 2003 U.S.EPA Water Quality Trading Policy.<sup>1</sup> States and other agencies have adopted and implemented (to varying degrees) various derivatives of this policy.



**Figure 1.** Locations of Water Quality Trading (WQT), Adaptive Management (AM), and Multi-Discharger Variance (MDV) projects for which application forms have been submitted to WDNR.

<sup>1</sup> See: <https://archive.epa.gov/ncer/events/calendar/archive/web/pdf/finalpolicy2003.pdf>

### ***1.1.1 Wisconsin Water Quality Trading Program Introduction***

In 1997, water quality trading was introduced to Wisconsin through state legislation under Section 283.84 *Trading of water pollution credits*. Section 283.84 directed the WDNR to pilot at least one project to evaluate the trading of water pollution credits. This prompted WDNR to pilot water quality trading in three study areas (Red Cedar River Watershed, Fox-Wolf Basin, and Rock River Basin) in response to a technology-based phosphorus effluent limit of 1 mg/L in the three watersheds. Only one trade occurred between a point source and agricultural nonpoint sources during the pilots. Credits were purchased in this trade by the City of Cumberland, which paid \$3.85/pound of phosphorus for credits generated by the conversion of conventional tillage to no-till systems. In response to promulgation of phosphorus water quality criteria (ch. NR 102, Wis. Adm. Code) and methods for deriving water quality-based phosphorus limits in 2010, WDNR released their first framework for water quality trading in Wisconsin in 2011, later building on this framework with the 2013 guidance document *Guidance for Implementing Water Quality Trading in WPDES Permits* (WDNR 2013c).

Water quality trading is authorized in Wisconsin for municipal and industrial Wisconsin Pollutant Discharge Elimination System (WPDES) permit holders to meet compliance with water quality-based effluent limitations. The process for potential credit buyers seeking compliance through water quality trading (WQT) is outlined in WDNR's 2013 guidance and summarized in Table 1.

**Table 1.** Process in WDNR Guidance for Water Quality Trading Credit Buyers (N/A = not applicable).

<b>Steps for Potential Buyers for Obtaining Compliance Through WQT</b>	<b>Details for Steps</b>	<b>Associated WQT Documents</b>
1. Evaluate Compliance Options & Select Trading	Calculate pollutant offset needed	N/A
	Identify a credit broker/exchange, if applicable	
	Identify potential credit generators	
	Assess availability of credits	
2. Submit Notice of Intent to WDNR	Submit Notice of Intent to wastewater engineer/specialist	Notice of Intent
	Submit Notice of Intent to WDNR	
3. Develop Trading Plan, Checklist, and Trade Agreements	Identify NPS willing to generate credits	Trading Plan Trading Checklist Trade Agreements
	Identify significant pollution generating site in watershed for cost-effective nutrient reductions	
	Consider economic issues associated with credit costs including: installation, maintenance, administrative, and trade ratios	
4. Submit Trading Plan, Checklist, and Trade Agreements	Submit Trading Plan, Checklist, and Trade Agreements to the WDNR for Review	Trading Plan Trading Checklist Trade Agreements
5. Public Comment Period on Final Water Quality Trading Strategy	Public Comment Period	N/A
6. Permit Reissued, Modified, or Revoked	WDNR reviews and reissues or modifies permit with trading conditions	N/A
7. Implement NPS Management Practice	Register practice once it has become effective by submitting Management Practice Registration to WDNR	Management Practice Registration

Section 283.84 requires a binding written agreement between the credit buyer and credit generator, and/or WDNR or a local government unit. Depending on the entities engaged in the trade, there are five different trade agreements. Section 283.84 also specifies that the terms and conditions related to trade agreements are included in new, reissued, or modified permits.

### ***1.1.2 Current Status of Water Quality Trading Program***

WQT activity assessed using Notice of Intent (NOI) documents submitted to WDNR between October 2013 and July 2017 includes 14 different projects in multiple watersheds (defined at the HUC12 level). All involve phosphorus, though total suspended solids (TSS) is also to be traded in one case. Permittees include municipalities and dairy-related industries. Most are located in non-point source (NPS)-dominated watersheds, with a range of credit generator types such as agriculture NPS, non-permitted urban discharges, and permitted MS4s. In some cases, credit generators were located in a different HUC12, and in some cases also are located downstream of the WQT applicant. Four applicants indicated they were unsure whether a broker/exchange would be used to facilitate the trade, two indicated that a

broker/exchange would be used, and the remainder indicated that no broker/exchange would be used. Methods for quantifying credits involve modeling in most cases, though monitoring is also indicated by some applicants. Modeling tools included SnapPlus, SLAMM, and STEPL. The projected date that credits would be available ranged from 2013 for an NOI submitted in the same year to 2021 (“and beyond”).

### ***1.1.3 Challenges of Water Quality Trading Program***

This section of the memorandum considers issues associated with the contracting process, transaction costs, economic benefits of trading, and uncertainty associated with credit quantification for Wisconsin WQT applications as these would relate to clearinghouse opportunities.

#### ***1.1.3.1 Lengthy Contracting Process for Credit Buyers***

WDNR forecasts that the current process for a potential credit buyer to execute a water quality trade to meet compliance may take 3 to 5 or more years. Table 2 describes the approximate timeline for these steps and WDNR’s parallel regulatory process.

The lengthy contracting process can be attributed to the time required to develop a trading agreement and trading plan as well as the time required by WDNR to perform the administrative review and permit modification. Each potential buyer must spend a substantial amount of time and resources developing trading agreements and plans. This includes identifying potential participants in the watershed who can generate credits and assess availability of credits. For most potential buyers, it will take more than a year before a Notice of Intent can be submitted to the WDNR and approved.

The administrative review process is also relatively lengthy as potential buyers must wait for the WDNR to sequentially review and approve the Notice of Intent, WQT Plan & Checklist, and Management Practice Registration before a credit can be effective. Trade agreements are required by law but do not have to be submitted to WDNR. However, if trade agreements are not submitted to WDNR, WDNR will have to initiate an additional certification step to validate that a trade agreement exists. Section 283.84 requires that the terms of the trade agreement are memorialized in the reissued or modified permits. This not only requires time for WDNR to review and reissue permits, but also time for a public comment period.

**Table 2.** Approximate timeline for Credit Buyer and associated WDNR Steps.

Approximate Timeline	Credit Buyer Steps	WDNR Steps
Year 0 to Year 1	<ul style="list-style-type: none"> <li>Evaluate compliance options for WQBELs</li> <li>Select water quality trading as preferred compliance option</li> </ul>	Provide permittee WQBELs Aid permittee in Evaluating WQT
Year 1	<ul style="list-style-type: none"> <li>Submit a WQT Notice of Intent to WDNR</li> <li>Complete s. 283.84, Wis. Stats, Trade Agreements</li> </ul>	Review WQT Notice of Intent
Year 2	<ul style="list-style-type: none"> <li>Submit a WQT plan &amp; checklist</li> <li>Install NPS management practices (NPS generators only)</li> </ul>	Review WQT plan & checklist Reissue or modify WPDES discharge permit to allow WQT
Year 3	<ul style="list-style-type: none"> <li>Practices become effective</li> <li>Submit management practice registration (NPS credit generators only)</li> </ul>	Review management practice registration (NPS credit generators only)
Year 4 to Year 5+	<ul style="list-style-type: none"> <li>WQBELs become effective</li> <li>Continue to comply with WQBELs &amp; Permit Requirements</li> </ul>	Evaluate compliance with WQBELs Continue to review compliance. modify permit as necessary

Source: WDNR. 2013c. *Guidance for Implementing Water Quality Trading in WPDES Permits*, Figure 7, p. 39.

### *1.1.3.2 Excessive Transaction Cost for Credit Buyers/Sellers*

The lack of connectivity between point sources and nonpoint sources in Wisconsin creates excessive transaction costs attributed to identifying credit purchasers/generators and negotiating every trade agreement. As acknowledged by the WDNR, most point sources will not have working relationships with nonpoint sources that can generate credits. Although WDNR recommends the use of credit brokers or exchanges to overcome this challenge, brokers and exchanges are not well established in Wisconsin. There are only a few examples of credit brokers being used for a water quality trade in Wisconsin including:

- The “Fox P Trade” brokered by the Great Lakes Commission in 2016 where only one pilot transaction occurred with a very high administrative burden to the Commission, (e.g., trade documentation exceeded six hundred pages of paperwork for a credit contract of \$17,000)
- Two trades brokered for the Marathon City WWTP and Springfield Clean Water LLC in 2016, and
- A trade brokered by the Barron County Land Conservancy Department for the Village of Cumberland the late 1990s

In light of this lack of credit brokers and exchanges, point sources interested in water quality trading will likely have to self-assess the feasibility in their watersheds and search for available credits or potential nonpoint source generators themselves. If potential credit generators are unknown, WDNR recommends conducting a watershed inventory, which will require specialized expertise. Once a point source has

identified potential credit generator(s), both parties then must negotiate the terms of their trade agreement, including credit price and monitoring. Although some of these transaction costs apply to credit sellers including identifying potential buyers, negotiating legal and financial arrangements, and potentially verification of project performance, most of these transaction costs are fixed to point sources as the majority of the tasks required to be completed in WQT, AM, and MDV are the responsibility of the point source seeking a compliance option or variance.

#### *1.1.3.3 Uncertainty or Credit Economics for Credit Buyers/Sellers*

As previously mentioned, trade agreements are statutorily required in Wisconsin between credit buyers and sellers. The nature of these bilateral trade agreements may generate occasional individual trades but are a hinderance to the development of credit marketplaces that can create certainty around credit economics for buyers and sellers. These trade agreements require the negotiation of terms between the point source and nonpoint source, which presents a stumbling block for the establishment of credit marketplaces such as clearinghouses, exchanges, or auctions. Without these types of marketplaces, it can be very difficult for potential credit buyers and sellers to predict the potential availability of credits, demand for credits, and credit price. The uncertainty of credit economics paired with the lengthy lead time for credits to be generated presents a significant challenge to: 1) risk-averse point sources seeking to pursue water quality trading as a cost effective and reliable compliance option, and 2) nonpoint sources considering incorporating conservation practices or technologies into long-term farm economics.

#### *1.1.3.4 Lack of Uniformity in Quantifying Water Quality Benefits for WDNR*

WDNR currently recognizes several models for estimating phosphorus and total suspended solids (TSS) reduction from agricultural conservation practices:

- Program for Predicting Polluting Particle Passage thru Pits, Puddles, & Ponds (P8)
- SNAP-PLUS (Wisconsin Phosphorus Index)
- Spreadsheet Tool for Estimating Pollutant Load (STEPL)
- Soil and Water Assessment Tool (SWAT)
- Source Loading and Management Model for Windows (WinSLAMM), and
- UW Barnyard Tool APLE-Lots

Although WDNR has recommendations for which models should be considered for each best management practice, each practice has at least two alternative ways of quantifying pollutant reductions. While allowing some flexibility in the use of models is appropriate, differences in modeling approaches can lead to differences in estimated pollutant reduction, and can undermine the confidence of buyers, sellers, regulators, and the public. These concerns will principally apply to WQT, though excessive uncertainty in model predictions can impact the viability of AM programs as well. A clearinghouse may facilitate consistency in the application and use of modeling approaches in a WQT program.

## **1.2 Adaptive Management**

Adaptive management (AM) allows point and nonpoint sources to work together to improve water quality to meet phosphorus standards within a watershed through collaborative efforts and resources. This programmatic approach is not considered to be a direct parallel to WQT where there are individual transactions for specific load reductions used for a permittees NPDES permit compliance. Rather, this program obligates an entity to the long-term responsibility of watershed reduction efforts to ultimately

meet compliance of instream phosphorus standards rather than just their end-of-pipe permit limit. AM was conceived of in Wisconsin for this application but has not been similarly adopted in other states in this programmatic form to the knowledge of K&A.

### ***1.2.1 Adaptive Management Introduction***

The same phosphorus criteria created in 2010 that prompted legislation for Water Quality Trading also triggered the development of Adaptive Management (AM) as another compliance option for point and nonpoint sources. Adaptive Management was codified in S. NR217.19, Wis. Adm. Code. WDNR released their *Adaptive Management Technical Handbook* in 2013 to guide stakeholders through the adaptive management process.

WPDES permittees that choose to use AM as a compliance option will have their permits renewed or modified with the applicable phosphorus criterion on a WDNR-approved schedule; progress will be measured by instream monitoring within the watershed. Adaptive management is not prescriptive in the management practices that need to be implemented.

Permit holders may be eligible for Adaptive Management: 1) if the receiving water is in exceedance of the applicable phosphorus criterion, 2) if filtration or equivalent technology would be required to meet phosphorus limits, and 3) where either at least 50% of the total contribution of phosphorus is from nonpoint sources and permitted municipal separate storm sewer systems (or permittee can demonstrate that the applicable phosphorus criterion cannot be met without control of phosphorus from nonpoint sources). The process for permit holders seeking to use adaptive management is described in Table 3.

**Table 3.** Steps for Potential Buyers for Obtaining Compliance Through Adaptive Management.

Evaluate Compliance Options and Select AM
Submit AM Eligibility Form to WDNR
Develop an AM Plan
Submit AM Plan with Permit Application or Request for Permit Modification
Public Comment on AM Plan
Permit Reissued, Modified, or Revoked and Reissued

Requirements for adaptive management include the adaptive management plan, in-stream monitoring, effluent monitoring, compliance of interim limits, and annual reporting. Developing an adaptive management plan takes a significant amount of time and resources to organize stakeholders. The steps and associated tasks for developing an adaptive management plan are summarized in Table 4.

Interim limits are applied to the facility and are meant to be achievable by facility optimization and modest upgrades. Interestingly, a permittee can also use water quality trading to meet these interim limits.



**Table 4.** 9 Steps for implementing Adaptive Management.

<b>Step of the Adaptive Management Plan</b>	<b>Tasks in the Step</b>
<b>1. Identify partners</b>	Identify potential partners, their role in adaptive management, and develop a communication strategy. Create Memorandum of Understanding (MOU) between partners, if desirable.
<b>2. Describe the watershed and set load reduction goals</b>	Describe the adaptive management action area including the counties in the watershed, available water quality data, number of reaches, hydraulic retention time and/or stream order data.
<b>3. Conduct a watershed inventory</b>	Gather current and historic land use data, and describe the physical features of the action area, typical agricultural practices in the watershed, and potential land uses in the future.
<b>4. Identify where reductions will occur</b>	Evaluate all data gathered in step 3 for decision-making purposes and identify critical areas within the action area to target management practices.
<b>5. Describe management measures</b>	Complete a facility plan to comply with interim limits, if necessary, and identify management measures that will be installed throughout adaptive management implementation to control nonpoint sources of excess phosphorus.
<b>6. Estimate load reductions expected by permit term</b>	Quantify the phosphorus reductions needed from point sources, and approximate the phosphorus reductions expected from nonpoint source management measures.
<b>7. Measuring success</b>	Develop a monitoring strategy that will identify who will collect TP data, who will analyze these data, when and where samples will be collected, and the quality assurance protocols that will be followed.
<b>8. Financial security</b>	Evaluate adaptive management implementation costs, and provide a written statement from adaptive management participants that these financial needs are achievable.
<b>9. Implementation schedule with milestones</b>	Prioritize implementation measures, and develop a schedule by setting compliance dates for adaptive management interim limits and water quality milestones.

Source: WDNR. 2013b. *Adaptive Management Technical Handbook*, Table 3, p. 24.

### ***1.2.2 Current Status of Adaptive Management***

Only six adaptive management requests were available to review at the time of this writing. Three of these are identified as associated with the Yahara River watershed AM plan, including a request

submitted by the Madison Metropolitan Sewerage District. All request forms indicate that adaptive management plans have been completed. A review of the Yahara River AM Plan revealed several important elements. Madison Metropolitan Sewerage District is WPDES-permitted point source. Their AM plan builds off of existing partnerships from a previous pilot project, including WPDES permit holders that are identified in the Rock River TMDL, other wastewater treatment plants and MS4s. Other partners are not WPDES permit holders and include agricultural producers (e.g., Yahara Pride Farms), county, state and federal agencies, and non-profits.

Achieving the water quality criterion is expected to come through implementation of agricultural phosphorus control practices in Dane County which are expected to occur in three phases. The first phase includes an evaluation of the Rock River TMDL to: 1) establish load reductions and prioritization for NPS phosphorus-contributing areas, and 2) develop an inventory of resource concerns based on prioritized source areas. The second phase focuses on conservation planning and practice implementation as well as phosphorus reduction quantification as a result of implementation. The third phase includes verification of installed practices with follow-up landowner visits, addressing maintenance and operation concerns, updating phosphorus load reduction modeling, and developing reports of adaptive management plan activities.

The AM Plan also addresses financial aspects of the Plan. The preliminary cost estimate for this AM effort is approximately \$94 million over the 20-year implementation period beginning in 2017, targeting a total P load reduction of roughly 94,000 lbs/year. Of this, roughly \$30 million is for planning, designing, constructing, and on-going verification of installed practices. Roughly \$58 million cover the estimated cost of the practices, and roughly \$6 million is allotted to water quality monitoring. Some \$5,669,000 will cover water quality monitoring and the installation of two new USGS gages for the life of the adaptive management project. Costs are to be divide among WPDES permittees, producer cost-share, and funding from local, state and federal programs.

### ***1.2.3 Challenges of Adaptive Management***

#### *1.2.3.1 Difficulties Associated with Developing Adaptive Management Plan for Permittees and Pollutant Load Reduction Generators*

Adaptive Management suffers from the same lack of connectivity between point sources and nonpoint sources found in the water quality trading program. The task of developing an Adaptive Management plan is complicated and requires a significant amount of coordination between stakeholders. Permittees must identify partners, determine their roles, create a communication strategy, negotiate Memorandums of Understanding, gather and evaluate data, target most effective reductions, and plan a strategy for measuring success. Additionally, there are few avenues for nonpoint sources interested in generating pollutant reductions to solicit their services for an AM plan without the help of a local conservation district.

#### *1.2.3.2 Uncertainty of Compliance Cost for Permittees Due to Uncontrollable or Unforeseen Circumstances*

One of the inherent difficulties of AM is a degree of cost uncertainty related to the attainment of phosphorus criterion at the watershed scale. Although permittees can prepare for compliance costs according to the initial adaptive management plan, WDNR expects changes to be made. The reality of this uncertainty is recognized in WDNR's guidance where WDNR provides flexibility for adjustments to the

AM plan to be documented in each annual report, and not in permit reissuances or modifications. The uncertainty of compliance costs is exacerbated in watersheds with less existing instream monitoring data; uncertainty in the amount of pollutant reductions required in a watershed will translate to changes in the number of practices required and cost to negotiate and implement those practices.

Additionally, the AM compliance option can be dismissed by WDNR and replaced with a phosphorus effluent limit for circumstances beyond a permittee's control. According to S. NR217.19, Wis. Adm. Code, WDNR is authorized to terminate the AM option due to such situations or circumstances that make compliance goals and measures infeasible. Even new information that becomes available which changes the department's determinations of applicability of AM can trigger the termination of the AM compliance option. With no basic force majeure provisions, permittees utilizing AM can be subject to a new and costly phosphorus effluent limit for uncontrollable or unforeseeable issues.

#### *1.2.3.3 Inviability Compliance Option for Some Permittees*

Adaptive Management is not viable for all dischargers due to eligibility requirements and economic feasibility. For example, municipal lagoon systems and other small dischargers may struggle to achieve economies of scale with pollutant reduction that may be required to make adaptive management a cost-effective compliance option. WDNR has tried to address this by allowing smaller dischargers to work in smaller watersheds. However, the amount of phosphorus that some small dischargers contribute often does not justify the use of AM.

### **1.3 Multi-Discharger Variance**

Similar to an individual variance, the MDV allows multiple point sources to obtain a variance from low-level phosphorus limits during an extended period with the commitment to reduce effluent phosphorus. MDV is a unique program specific to Wisconsin that was an outgrowth of legislative concerns with costs or WQT or AM. Unlike WQT and AM options, MDV cannot be used for achieving compliance.

#### ***1.3.1 Multi-Discharger Variance Introduction***

In response to the phosphorus criterion developed in 2010, the Wisconsin Phosphorus Variance became effective in 2013 through the codification of Section 286.16, Wis. Stat. Wisconsin's phosphorus Multi-Discharge Variance was later approved by EPA in 2017. The MDV was explored as a temporary option for permittees facing costly facility upgrades to achieve phosphorus effluent limits after many wastewater treatment facilities found WQT and AM infeasible. Among the barriers cited in these regards are "insufficient political support, unwilling partnerships, eligibility constraints, economic limitations, and compliance risk" (WDNR 2017).

The purpose of the MDV is to streamline the requesting and granting of variances by forgoing the formal EPA review process for individual variance requests and instead having DNR make site-specific determinations on MDV applications. Permittees using MDV will be required to meet interim facility-specific requirements and watershed project requirements. The default interim facility-specific requirements are described in Table 5, but site-specific interim requirements can be calculated on a case-by-case basis depending on the highest attainable condition.

**Table 5.** Default Interim Limitations by Permit Term Specified in s. 283.16, Wis. Stat.

Permit Term 1	0.8 mg/L
Permit Term 2	0.6 mg/L*
Permit Term 3	0.5 mg/L*
Permit Term 4	MDV concludes TP WQBEL included in WPDES permit

\*- MDV permit terms and conditions cannot extend beyond the expiration date of the MDV approval, February 5, 2027. DNR, EPA, and stakeholders will continue to evaluate options to maximize the duration of the MDV, as appropriate. Source: WDNR. 2017. *Guidance for Implementing Wisconsin's Multi-Discharge Variance for Phosphorus*, Table 2, p. 12.

Watershed projects can be implemented through three options. Permittees can either: 1) make a payment to counties in the same HUC8 of \$50 per pound of required effluent load reductions (adjusted for inflation and capped at a total of \$640,000 per year), 2) enter into an agreement with WDNR to allow the permittee to implement projects in the HUC8 equal to the phosphorus reductions required, or 3) enter into an agreement with a third party to implement projects in the HUC8 to generate the phosphorus reductions required. In watersheds with a TMDL, the number of pounds of phosphorus required to be purchased through the variance will be equal to the permittee's phosphorus load that exceeds their phosphorus effluent limitations based on the TMDL. Non-TMDL watersheds will have a target set at an average phosphorus effluent limitation of 0.2 mg/L. Permittees using the self-implementation or third-party watershed projects option will have to enter into binding agreements and provide annual reporting to WDNR. Permittees using the county payment option will not have to abide by a written agreement. The counties are responsible for submitting an MDV plan of proposed projects to the WDNR, verification, monitoring, annual reporting, and certifying that MDV funds are being used appropriately.

### **1.3.2 Current Status of Multi-Discharger Variance**

MDV applications include five industrial and 15 municipal permittees. Industrial permittees were from cheese (2), paper (2), and food (1) categories located in five different counties. Applications were signed between March and June of 2017. One applicant identifies a TMDL (Fox River) as the basis for the requested variance. All applicants indicate that a major facility upgrade is required to achieve compliance with the WQBEL. Average phosphorus concentrations in effluent range from 0.64 mg/L to 0.95 mg/L. In all cases, the MDV is requested to apply in all 12 months (i.e., the entire year rather than for specific months). The total cost for complying with phosphorus WQBELs ranges from \$2.5 million to \$62 million, and the needed phosphorus offset to comply with AM or WQT ranges from 415 lbs/year – 3,300 lbs P/year (one of the five industries indicates that the size of offset is unknown at this time). All five applicants indicate that the feasibility of WQT and AM have been evaluated, that all are eligible, and that none determined that WQT or AM were feasible. All selected the county payment option instead of the option to enter into a binding, written agreement with WDNR or another entity.

Municipal permittee applications were signed between March 2017 to February 2018. Facilities were located in nine different counties (three were in a single county). Discharges for all applicants ranges from 0.05 MGD to 2 MGD. None were applying for relief from TMDL limits (all indicated concentration-based WQBELs were the driver of their MDV application). Phosphorus concentrations in effluent ranged from 0.26 mg/L to 6.7 mg/L (includes some P99 estimates). In all cases, the variance is being requested for all 12 months, and applicable WPDES permit limits are not less than 1 mg/L. Total cost estimates for complying with the phosphorus WQBEL range from \$1.1 million to \$10.2 million. All applicants indicate that the feasibility of WQT and AM have been evaluated, that all are eligible, and that

none determined that WQT or AM were feasible. Phosphorus offsets needed range from 30 lbs/year to 7,134 lbs/year (one indicating “unknown at this time”).

### **1.3.3 Challenges of Multi-Discharger Variance**

#### *1.3.3.1 Lack of Accountability and Uncertainty for Water Quality Benefits Generated by County Payment Funded Watershed Projects for WDNR*

Counties receiving payments from the MRV’s watershed project option must submit an MDV plan and report progress and estimated reductions on an annual basis to the WDNR. However, counties are not incentivized to generate the most cost effect reductions as 35% of these payments can be used by the county for staffing, monitoring, and modelling efforts alone and do not directly contribute to generating the estimated phosphorus reductions in the MDV plan. Additionally, unlike the self-implementation and third-party options, where liability for project conditions are explicit and assigned in the binding contract, there are no liability conditions for counties in the event that the estimated reduction in the MRV plan do not materialize. Unlike WQT, AM, and the other two watershed project options of MDV, the projects implemented by the county payment option do not assign liability or provide assurances if estimated phosphorus reductions are not generated. This creates uncertainty as to whether expected water quality benefits are being realized.

## **2.0 OPPORTUNITIES FOR CLEARINGHOUSE TO ADDRESS WISCONSIN PHOSPHORUS REDUCTION PROGRAM CHALLENGES**

This section assesses challenges to Wisconsin’s phosphorus reduction programs that could be addressed through a clearinghouse structure and offers initial considerations. K&A also identifies herein whether there are challenges that cannot or likely will not be addressed through a clearinghouse structure.

### **2.1 Water Quality Trading**

#### *Reducing Lengthy Process, Eliminating Transaction Costs, and Providing Uniformity in Quantification of Water Quality Benefits*

A clearinghouse could reduce the lengthy process for credit buyers and sellers by providing assistance with a range of program needs and requirements including: documentation and reporting, consistent use of credit calculations, providing ‘one-stop’ shopping, development of partnerships, and assistance with technical information. This would likely help eliminate some transaction costs and provide greater uniformity in quantifying water quality benefits.

A Wisconsin clearinghouse could reduce the time it takes for a permittee to receive a permit modification or reissuance by reducing the burden currently placed on permittees to evaluate the feasibility of WQT in their watersheds, identifying and negotiating trade agreements with a standardized form, and developing consistent trading documents through a standard protocol. Interested buyers and sellers of WQT credits could submit one document to the Clearinghouse with the information required in the current documents including:

- Notice of Intent
- Trading Plan
- Trading Plan Checklist
- Management Practice Registration (upon project implementation)

The Clearinghouse would provide technical expertise to WQT applicants and the standard quantification method to provide greater uniformity in credit calculations. The clearinghouse could either match credit buyers and sellers in the same watershed, or have outright ownership of credits generated by sellers and purchased by buyers. All required information would be verified by the clearinghouse and submitted to WDNR for review. This would streamline the entire process for all parties. The clearinghouse would also manage the tracking and registering of credits and projects.

Overall, transaction costs associated with current WQT experiences would likely be reduced. Cost-savings might vary depending on whether there was one state-wide clearinghouse, or individual clearinghouses established by watershed. Locally-established clearinghouses might inherently have greater access to local champions and knowledge providing refined and relevant watershed information. An existing organization could potentially staff the entire clearinghouse needs, though standardized, state-wide available infrastructure (e.g., a registry, forms, etc.) would likely be needed. A state-wide clearinghouse option would likely have fewer staff needs, have the need to manage infrastructure a one location, and rather rely on a local entity for coordinating watershed-based needs. MDV approaches for the local coordination could be a model for how to facilitate a single state-wide clearinghouse at the local level.

*Reducing Uncertainty or Credit Economics for Buyers/Sellers*

The clearinghouse could identify and match buyers and sellers by creating a marketplace. A clearinghouse also could go a step further and purchase credits from credit generators and transact the credit to permittees, creating increased certainty around credit purchase price and availability. If this process can be designed to occur within a compliance year, a clearinghouse may also create an opportunity to incentivize nonpoint sources to implement practices prior to the permit modifications by the state. This is because reductions generated by the project during the compliance year could be credited if they are implemented early enough. This effect would be further advanced if the clearinghouse were to operate by purchasing credits from credit generators and then transacting the credits to permittees. Either approach could be connected to a registry to track credit transactions.

*Potential to Provide Environmental Assurances for WDNR and Project Failure and Risk Management for Buyers*

A clearinghouse could afford WDNR the opportunity to provide environmental assurances for project failure. This could be accomplished most easily through the establishment of a surplus pool of credits within the clearinghouse. Additionally, a greater incentive could be provided to permittees to utilize WQT if a degree of liability could be absorbed by the clearinghouse. Although complete displacement of regulatory liability for permittees in the instance of project failure may be unlikely, it may be possible for the clearinghouse to cover this with an insurance pool of credits. This could ease the uncertainty of buyers by taking on the responsibility to ensure an ample credit supply and replacement credits are available for each trade. WDNR guidance for WQT states that credit exchanges can take some liability, which could potentially extend to the clearinghouse.

## **2.2 Adaptive Management**

### *Difficulties associated with Developing Adaptive Management Plan for Permittees and Pollutant Load Reduction Generators*

The clearinghouse can function very similarly in this capacity as it would for WQT. The clearinghouse could identify pollutant reduction generators within the watershed, even prioritize those for AM investments. The clearinghouse could do this through provision of technical expertise in crafting a watershed AM Plan, making necessary adjustments to the AM Plan and/or manage the ongoing reporting and documentation. If not all of these responsibilities, the clearinghouse could minimally provide and manage project investment approaches like reverse auctions to generate and track load reductions while the AM-responsible entity would manage other AM program requirements.

### *Facilitate the use of WQT for Interim Limits for Permittees*

Permittees seeking to use AM as a compliance option may use water quality trading to meet interim phosphorus limits for their facilities. However, this may not currently be a viable option due to the currently lengthy procedure to acquire WQT credits. The Clearinghouse could provide a synergy between the AM and WQT by offering available water quality trading credits for permittees without requiring permittees to bear the full burden of the current lengthy and resource-intensive WQT process. This could potentially be done with reductions generated through reverse auctions where a portion of these could be traded with the insurance pool being the other reductions generated.

### *Providing Permittees a More Feasible Compliance Alternative if Adaptive Management is Terminated or Anticipated Water Quality Improvements are not Observed*

This synergy between AM and WQT could be further expanded in the circumstance that Adaptive Management is terminated as a compliance option due to uncontrollable or unforeseen circumstances, or water quality criteria in the receiving water are not achieved within the AM time limits. In these circumstances, permittees are brought back into a permit with a phosphorus effluent limit. The clearinghouse would be able to provide more readily accessible WQT credits for permittees that cannot meet these effluent limits without costly facility upgrades. Potentially, accrued reductions could be used in these regards, though such would need to be approved by WDNR.

The clearinghouse also could potentially provide permittees who need to modify their AM plan with more phosphorus reductions, an option for pre-approved and quantified phosphorus reduction generating projects in the watershed at a pre-determined price. The permittee could potentially make a payment to the clearinghouse for these pre-approved projects, making it easier for the projects to be implemented immediately upon the clearinghouse transacting the funds to the credit generator.

## **2.3 Multi-Discharger Variance**

### *Providing Creditability and Accountability for MDV-funded Watershed Projects for WDNR*

A clearinghouse structure would be able to provide many of the benefits to all three watershed project options of the MDV that it does to WQT and AM options. The clearinghouse could provide technical assistance for quantifying reductions using a more standardized methodology across all three programs, manage reporting, documenting, and tracking of compliance. In some MDV forms, the clearinghouse could also match buyers and sellers. The clearinghouse could provide technical expertise to county

partners and provide a means for them to prioritize, publicly track, and register their progress providing public transparency and accountability which is otherwise not required under this MDV option.

## **2.4 Examples Provided by Other Clearinghouses**

A clearinghouse approach would likely facilitate some or most of the programmatic elements of Wisconsin's WQT, AM, and MDV options. This especially would help advance WDNR phosphorus reduction goals by streamlining and standardizing a range of program requirements. In addition to creating a stable marketplace for the exchange of phosphorus reduction credits, the clearinghouse could provide assistance to credit buyers with several programmatic needs that are common across all three options depending on how it was structured. These include: 1) technical needs, 2) coordination/partnership needs, 3) reporting/documentation needs, and 4) communication, marketing, and stakeholder outreach needs. The K&A Task 1 memorandum titled "Crosscut Analysis of Clearinghouse Structures for Water Quality Trading in North America" previously provided to Newtrient, reviews several existing clearinghouses that are functioning in a WQT context. The following section provides a review of programmatic needs and some examples from these clearinghouses of ways in which Wisconsin needs addressed in support of their phosphorus reduction programs.

### **2.4.1 Technical Needs**

The amount of modeling and technical expertise required to assess, identify, and quantify the baseline and/or pollutant reductions required for all three types of phosphorus reduction programs in Wisconsin is substantial. Although counties may have the staff to perform these activities, point source permittees and nonpoint sources must rely on technical assistance which creates another barrier to entry for participation in WQT, AM, and in some variations of the MDV program. Many clearinghouse-like entities have staff to support and facilitate the modeling and technical needs of potential participants.

In the context of WQT, a specific technical need is assistance in providing credit information and a platform to conduct credit trades. These kinds of services are important for permittees weighing the benefits of WQT against costly facility upgrades, and farmers interested in incorporating conservation practices as part of their farm economics. Any assistance that can be provided in a WQT program to make credit pricing and credit availability more transparent and predictable can substantially aid participation by permittees and credit generators.

Some WQT programs such as Long Island Sound, South Nation TP Management Program, Colorado Water Quality Control Commission, and Virginia Nutrient Credit Exchange use clearinghouse-like entities to provide administratively determined prices for the purchase and sale of credits. Clearinghouses such as PENNVEST and the Great Miami River Watershed Trading Pilot not only assist in providing potential participants information on credit economics, but provide services for transacting credits. These include marketplaces with auctions, reverse auctions, and forward contracts available for potential participants to find buyers and sellers while providing information on credit pricing and availability.

### **2.4.2 Coordination/Partnering Needs**

Water quality programs like WQT, AM, and MDV are created based on the recognition that meeting a phosphorus criterion in affected watersheds will require both point sources and nonpoint sources efforts. However, this can be a difficult proposition for most point sources that do not have working relationships with nonpoint sources that could provide potential pollutant reductions. Other clearinghouses have been able to address this by introducing marketplaces in WQT that reduce the need for substantial coordination



between credit buyers and sellers. Clearinghouse-like entities can also be developed to assist in planning and creating partnerships such as the Virginia Nutrient Credit Exchange Association, which was developed to facilitate the WQT program, assist in identifying sellers and providing sufficient credits to meet buyer needs.

### ***2.4.3 Reporting/Documentation Needs***

None of the Wisconsin water quality programs are readily scalable without a system to manage the documentation and reporting required to confirm the performance of pollutant reduction generating projects, compliance with interim phosphorus limits, and progress towards AM and MDV plans from the array of stakeholders (i.e., point sources, nonpoint sources, counties, conservation districts).

Clearinghouses could manage documents, reporting, and registration through a registry to manage documentation and provide a publicly-accessible version to provide transparency and accountability.

In the context of WQT, clearinghouses can use the registry track credit transactions and provide information on credit economics. At some level, however, the clearinghouse structure will need to carefully define what it can and cannot manage in the context of administrative costs in alignment with credit pricing. Where there are easily purchasable and well-documented credits, buyers will likely find these attractive where they otherwise have assessed their own administrative costs are too high to otherwise invest in NPS phosphorus reductions. This lends validity to the need for supplemental funding for clearinghouse development whereby revenue from initial mark-ups on credit purchases will likely be insufficient for startup.

### ***2.4.4 Communications, Marketing, and Stakeholder Outreach Needs***

Resources and efforts to engage in stakeholder outreach and communication are necessary when the array of participants in the program are disparate and not well-connected to one another. Engaging and building trust with wastewater treatment plant representatives, individual farmers, county soil and water conservation districts, farm bureau offices, certified agronomists, and community-based watershed organizations was instrumental in the success of the Great Miami River Watershed Trading Pilot. Clearinghouses such as the Long Island Sound have used advisory boards composed of representatives of different stakeholders to improve communication and collaboration with different sectors and environmental organization.

But these relationships come at a cost that is not easily defined, and take time. Thus, how a clearinghouse can build upon and integrate existing local partnerships will be key to start-up. A state-wide clearinghouse (such as PENNVEST) has no objective need to work with local partners as they are the ‘grocery store’ for buying and selling credits with little to no investment of time and effort needed at the local level. In such cases, technical expertise must otherwise be in place to facilitate buyer and seller movement to the ‘grocery store’. Established by the state, PENNVEST is already structured to manage this level of clearinghouse responsibilities.

Other clearinghouses that offer a broader range of market/program services have existing structures and staff to address these. Alternatively, they have established relationships with other third parties that can be contracted as needed to assist where there is no in-house expertise. Again, the cost of both internal and external services will need to be covered with a sustainable funding stream. This is why most clearinghouses operate the governmental agencies and their existing structures.

### **3.0 REQUIREMENTS AND CONSTRAINTS FOR CLEARINGHOUSE**

This section is intended to summarize the policy, programmatic, or legal constraints that may hinder or affect the adoption or structure of the clearinghouse. This section will first focus on requirements/constraints associated with Wisconsin's three water quality programs.

#### **3.1 Considerations for Clearinghouse Based on Wisconsin Water Quality Programs**

##### *Program and Policy Considerations for Water Quality Programs*

Although a WQT plan is not required by law or regulation, WDNR WQT guidance does require a completed WQT plan to be submitted by the permittee prior to the modification or renewal of their permit. If a Clearinghouse were to facilitate WQT in Wisconsin, one of the roles it could provide is completing and submitting Water Quality trading plans and other trading documents to WDNR using applicant information on behalf of the credit buyer and seller. This would require WDNR to revise their policy to allow permittees utilizing the clearinghouse for WQT to forgo the process of separately developing and submitting a Notice of Intent, WQT plan, checklist, and Management Practice Registration and possibly the Notice of Termination if this information were to be managed by the Clearinghouse and submitted to the WDNR for review. Permittees utilizing Adaptive Management and self-directed/third-party Multi-Discharge Variance options must still conduct a watershed inventory and submit an adaptive management or watershed plan to the WDNR for review. However, the WDNR's process steps for Adaptive Management and Multi-Discharge Variance generally require fewer types of documents to be completed and submitted by the permittee. A change to the current Adaptive Management and Multi-Discharge Variance program/policy may not be necessary but could be beneficial for allowing a clearinghouse to provide more extensive services. Clarifying program language in WQT, AM, and MDV may allow the opportunity for a clearinghouse to aid permittees, nonpoint source phosphorus reduction generators, and counties in utilizing these programs.

##### *Legislative Considerations for Water Quality Programs*

In WQT, Section 283.84 requires a binding, written agreement between the credit buyer and credit generator, and/or WDNR or a local government unit and requires the terms of the trade agreement to be reflected in the permit through modification or renewal before WQT credits can be utilized for compliance. This type of trade agreement is designed to operate in bilateral trading of water quality credits. This currently requires a trade agreement between the credit buyer and credit generator. However, if a clearinghouse is intended to facilitate WQT for credit buyers/sellers by purchasing credits from generators and then transacting these credits to permittees, the statute would still require the original credit generator to be recognized in the trade agreement with the permittee. Not only would this make the process of transacting credits more difficult for the clearinghouse, it would also eliminate the opportunity for the clearinghouse to accept any liability, as liability is assigned in the trade agreement. This statute also presents a similar difficulty to the clearinghouse if it intends to facilitate WQT through operating a marketplace (although this can be mitigated in this scenario by tracking and attributing the credits generated by a project and creating the trade agreement after the transaction). A simple solution would be a revision to Section 283.84 recognizing trade agreements with a clearinghouse entity.

There are minor statutory considerations in implementing a clearinghouse intending to help permittees and partners with document management and submittal for Adaptive Management. This includes statutory language in S. NR 217.18, Wis. Adm. Code that only authorizes permittees to submit adaptive

management plans. There are also no significant statutory barriers for a clearinghouse to facilitate and provide services to permittees and counties under the Multi-Discharge Variance.

*Liability Considerations for Water Quality Trading Credit Exchanges*

WDNR guidance for implementing WQT does mention that credit exchanges can potentially take on some degree of liability for permittees. This is not further explained in the guidance and will require more discussion with WDNR to understand the extent of liability that could be absorbed for permittees through Water Quality Trading.

*Administrative Cost Considerations for Water Quality Programs*

In WQT, administrative costs would likely need to be paid for by the permittee separate from a potential markup on future trades as these are often burdensome, front-loaded costs. Standardization by the clearinghouse could likely streamline costs as there would be one approach to these submissions. These upfront efforts, however, might best be outsourced as there will not likely be a steady stream of WQT applications to consistently support clearinghouse staff for these duties. These administrative costs will likely be paid by permittees at the onset of utilizing clearinghouse services for AM and self-directed/third-party MDV options. If counties utilize a clearinghouse for the MDV county payment option, there may be the potential for this administrative burden to be paid by the permittee's county payment as part of the 35% of the payment that can be utilized for administrative and staffing purposes.

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