

## Water Quality Trading Framework Version 1.0 January 27, 2016

### Cover Letter

The Water Quality Trading Framework is being submitted to the Clean Water Commission for approval including a period for public comment. The framework, once approved, will set general policy guidelines for water quality trading in Missouri. Those seeking to create a trading program would then apply for approval of their specific program before having the terms of the trading program written into the applicable permits, as required. The department anticipates a small number of pilot trading programs will be established to help provide a practical test of the framework and are committed to making changes in the framework based on early experiences.

Starting in July of 2015, the department convened a work group of those parties interested in water quality trading as recommended in the state Nutrient Loss Reduction Strategy (LINK). The group's basic goal was to provide a framework for water quality trading programs in Missouri to help meet water quality goals. The department provided a facilitator for these meetings and had staff participate as members of the work group. These discussions continued roughly monthly. Each month a small set of factors critical to establishing water quality trading were selected for discussion and the group developed considerations that needed to be addressed related to each of the factors, which of these should be defined on a state-wide basis and which should be allowed to be set to fit local water quality conditions and goals.

This work group used a recent publication by the Willamette Group as a general guide to issues related to water trading (Willamette Partnerships World Resources Institute and National Network on Water Quality Trading, 2015. *Building a Water Quality Trading Program: Options and Considerations*. <http://willamettepartnership.org/wp-content/uploads/2015/06/BuildingWQTProgram-NNWQT.pdg>). In September, roughly a dozen members of the work group went to Lincoln Nebraska for a workshop on water quality trading sponsored jointly by the U.S. Department of Agriculture and the U.S. Environmental Protection Agency.

While all the general concepts in this document have been discussed and the early drafts were open to review by the members of the work group, no member of the work group or the organizations that each represents has formally endorsed this draft framework.

Public comment will be accepted from \_\_\_\_ until \_\_\_\_\_. The Missouri Clean Water Commission will hold a hearing to accept public comment on July \_\_\_\_ at \_\_\_\_ as part of the regularly scheduled Commission meeting.

Comments on the Strategy should be sent to:

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## **Goals and the Use of This Framework**

This document sets forth the basic policy required for water quality trading in Missouri. It is designed to guide any organization seeking to create a water quality trading program through the process for doing so. Each proposal must address the elements discussed in this document, but the framework allows flexibility for implementing these elements in the proposal.

This framework contains:

- Definitions of the terms used
- A description of common infrastructure available to support trading programs in order to keep costs of establishing and operating water quality trading programs to a minimum
- Descriptions of each element and the considerations that should guide decision-making for each element.
- References to key documents

The department established a working group in July of 2015 to examine water quality trading. The goal of this group was to provide a framework for water quality trading programs in Missouri that will serve as the policy statement on such trading by the Clean Water Commission and department.

The department and those stakeholders participating in this work group supported the establishment of voluntary water quality trading programs in Missouri as one of the tools to help meet local and state-wide water quality goals. The members of the group recognized that Missouri needed a framework that supports trading programs that are effective, efficient, and equitable for all those who wish to form a program or to buy or sell credits within a program.

Trading programs function best when adapted to and driven by local water quality conditions and specific water quality goals. Integrating water quality trading into watershed-based management provides a straightforward way to ensure water quality trading provides applicants the opportunity to meet water quality requirements in an economic way.

The group decided that any water quality trading framework must meet the following criteria to be effective. It must:

1. be both practical and protective of water quality.
2. create a clear financial benefit for trading as part of an overall water quality plan that outweighs the risks of trading.
3. balance risks to those buying and selling credits as well as risks to water quality.
4. be based on the best science available and be built to adjust to advances in understanding of practices, water quality impacts of actions and existing water quality in Missouri's lakes and streams.
5. assure accountability and monitoring to provide the necessary transparency to build confidence in water quality trading.

Water quality trading programs may take many forms in order to properly fit the local water quality goals, hydrology, pollutant(s) of concern, and credit market. This framework supports a broad range of options for trading programs.

Trading may occur:

1. between individual sources operated by a single permitted entity (such trades can be done through permitting without a formal trading proposal);
2. as a bilateral trade between two point sources operated by different continuing authorities;
3. through trades organized and implemented by the local, permitted entity or their agent; or
4. through the clearinghouse at the request of and in accordance with the water quality trading proposal of a local, permitted entity.

The latter two options may include both point source to point source trading and point source to non-point source trading.

**Anti-backsliding and Anti-degradation statements**

**Use of SWCP and NRCS practices in trading (as long as above any baseline defined in program)**

**Definitions:**

**Adaptive Management** – A systematic approach, used in natural resource management, to improve a system in response to additional information by incorporating new knowledge into the system. As applied to Water Quality Trading, this means changing the framework and its implementation as more is learned about trading, operating trading programs, water quality conditions and the efficacy of different practices.

**Attenuation** – A decrease in the quantity of a pollutant as it moves downstream as a result of physical, chemical and biological interactions within a stream or lake. Because trading is based on loading of a pollutant rather than concentrations of that pollutant, dilution is not applied to trading programs.

**Baseline** – The expected minimum level of performance with regard to pollution discharge. Only reductions of a pollutant beyond this level are eligible to be traded. For example, a point source's baseline will be its permit limit (as calculated as an annual load) in the absence of a water body impairment, TMDL or other restriction.

**Best Management Practice (BMP)** – A structural or non-structural action that reduces pollutant discharge. For agricultural non-point sources, BMPs are vetted by the USDA's Natural Resources Conservation Service and the Missouri Soil and Water Conservation Program.

Credits – The measured or estimated unit of pollution reduction resulting from a project or practice. This is the unit of exchange in water quality trading and is generally expressed in annual reduction in a pollutant load per year at a given point.

Common Infrastructure – Standardized capabilities run by the department of natural resources and its partners that support trading. The department uses the Missouri Soil and Water Information System (MoSWIMS) to track agricultural practices, the Nutrient Tracking Tool (NTT) to model the reductions in soil, nitrogen and phosphorus loss tied to individual and groups of practices. In addition, the Environmental Improvement and Energy Resources Authority (EIERA) will operate a standardized ledger that contains all of the practices eligible for purchase by location. These services will be charged through **\*\*\*TBD\*\*\***

Hotspot – An increased concentration of a pollutant that causes a localized violation of water quality standards. While trading may increase the concentration of a pollutant at some point within a watershed, a trading program must not allow a hotspot to occur. This can be accomplished by careful selection of project and practice locations.

Ledger (or registry) – The record of actions taken and credits awarded within a trading program. It provides a transparent method of tracking credits and determining whether a trading program is meeting its regulatory requirements. **Certain elements of the ledger (information on specific practices from individual private landowners) will be protected in accordance with state law.**

Life Cycle of Credits – The length of time after a practice has been implemented during which it can be traded.

Measuring Point – The point within a watershed at which the water quality for the trading program is determined. The measuring point must be downstream of the location of all practices and the point source(s) involved in trading.

Nutrient Tracking Tool – A validated, computerized system for estimating pollutant reductions that will result from a single or set of practices on agricultural lands.

Permit Condition – Enforceable component of a permit that allows water quality trading by the permitted entity while defining requirements to be met for trading.

Practice/Project – An effort to improve water quality through a specific action or set of actions. Practice, in general, refers to an action in agriculture, such as a BMP, while project tends to refer to actions at point sources or in urban areas. The terms are used interchangeably in this document.

Point Source to Point Source Trading – One point source makes improvements beyond those required by its permit in order to allow another point source to achieve a lesser level of performance than would otherwise be required.

Point Source to Non-Point Source Trading – A point source pays non-point sources in its watershed to implement projects or practices that improve water quality in lieu of installing more expensive solutions at the point source.

Reserve Credit – A credit earned prior to its use in a trade. Reserve credits can protect a point source against failing to meet its regulatory obligations as a result of unintended underperformance or failures of some of the projects/practices in its ledger. Reserve credits for annual practices can be used in the year after the practice is implemented. Credits for multi-year practices can be used in either of the following two years after implementation.

Total Maximum Daily Loads –The maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Trading Area – The area that contains all of the projects and practices as well as the point source buying water quality credits. Trading areas are set by the trading program, based on watersheds and the specific goals of each trading program.

Trading Framework – The state-level outline of policy that defines the expected elements to be included in any water quality trading program in Missouri.

Trading Program – A watershed-based effort in which regulatory requirements are met by reducing pollutant loads at one or more locations in exchange for lesser reductions at the permitted facility.

Trading Proposal – The document submitted to the Missouri Clean Water Commission that details the critical elements of a proposed trading program. The proposal will be subject to public comments and Commission approval before the trading program can become operable.

Trading Ratio – The numeric value applied to pollution reductions that accounts for differences in sources, seasonal pollutant loss, locations, attenuation, water quality risk and other factors that affect the fate and transport of the pollutant traded.

Water Quality Trading – An agreement between two parties in which one completes a practice or project that will improve water quality in exchange for payment from a party which will take credit for the water quality improvement resulting from that project or practice.

Watershed – The area of land that drains to a single point on a river or stream. Each trading program must define the watershed(s) or parts of a watershed that will serve as its trading area.

Watershed Plan – A coordinated effort to describe water quality conditions and to address the water quality concerns in a watershed. Missouri uses the 66 Hydrologic Unit Code 8 watersheds as the basis for its watershed planning.

## **Common Infrastructure**

The Department of Natural Resources will make available to trading programs a suite of systems or capabilities in order to support the greatest breadth of water quality trading in Missouri in return for payment for the services rendered. While no trading program is required to use these systems, each provides a function that will reduce the amount of locally-supported infrastructure required for trading.

### **Flesh out these sections**

**MoSWIMS – Provides accounting support**

**NTT – Models practice efficacy**

**Clearinghouse – Handles trades and provides a form of “insurance” for buyers against failed practices**

**Attenuation modeling**

There are three acceptable methods for determining the attenuation ratio to be incorporated into the trading program through the trading ratio. The ratio should reflect the amount of attenuation likely to occur for the specific pollutant(s) in the program and the size distribution of streams within the watershed. The department encourages all those planning to create a trading program to work with the department to establish a ratio appropriate for their program.

- a. A program can use a set of values that are provided by an external party and currently in use (for example the USGS attenuation ratio used in the USGS Mississippi River analyses and published by Anderson et al., 2008) or other values that have been calibrated such as those used in the Ohio River trading program.
- b. The program can set an attenuation value for all trades based on basin size and characteristics) and based on a method noted in option #1
- c. The program can calculate an attenuation ratio for each trade using accepted ratios and the position and stream characteristics of both sides of the trade.

**(Decide at February meeting)**

## **Required Elements of a Water Quality Trading Proposal**

Each water quality trading proposal must address all of the elements listed below in the order presented. Each proposed water quality trading program should clearly explain how it plans to accomplish the tasks needed for trading.

Elements #1-6 and #13 should match local conditions and goals. Elements #7-9 have been defined at a state wide level, but should be noted within the proposal. Elements #10-12 can be done locally or through the state Water Quality Trading Common Infrastructure. If the program does not plan to use the common infrastructure, it should explain how it will replicate those services and complete its reporting requirements as defined in permit.

### **Introductory Information**

1. The proposing organization, main contact with contact information;
2. The point sources to be included in the trading program;
3. Description of the major operational components, use of the clearinghouse, etc.
4. If done by a part other than the trading program organization, define the role of third parties in:
  - i. Assessing and validating practices
  - ii. Providing supporting services such as edger, practice or financial oversight
  - iii. Conducting WQ monitoring

### **Additional Information Needed**

#### **Element #1 - Water Quality Goal**

The trading program should have a clearly defined water quality goal that addresses the reason for the establishment of the program. This should include details including the location and any causes of impairments of water bodies within the area, location of point sources to be involved in trading and how the proposed trading program goals fit with watershed goals if these have been defined through Our Missouri Waters or other methods.

The following considerations may help define the water quality goal:

5. the water quality impairments, their extent and the location of sources of pollution within the watershed upstream of the impaired water body;
6. The chemical species responsible for the impairment;
7. Permit requirements on point sources within the watershed;
8. Common agricultural BMP's in use in the area and their distribution;
9. The local interest in additional BMP implementation;
10. Locations and discharges of other point sources within the watershed;
11. Stream size distribution and impacts on attenuation ratios;
12. The measuring point for the trading program;

13. How the program will prevent violations of water quality criteria in the watershed as a result of trading.

**THIS SECTION IS NOT YET COMPLETE. Please suggest additions.**

### **Element #2 - Trading Areas**

Each proposed water quality trading program must define the area for trades. The trading area defines where trades may occur and must include the site of any point sources to be involved in trading. The area must be justified in terms of water quality goals for the pollutants to be traded. Larger areas promote the greatest opportunity for trades, but present additional challenges in assuring that water quality benefits accrue as a result of trading. Applicants will need to address a broader range and higher number of concerns for potential local water quality degradation for larger trading areas.

The following issues should be addressed in defining the trading area:

1. The justification of the area selected in terms of water quality goals;
2. The location of the point source(s) within the trading area and the likelihood that overall water quality benefit will occur as a result of the proposed trading program;
3. Local factors, including water quality impairments, Total Maximum Daily Loads (TMDLs) and other Clean Water Act or other permit requirements related to the chemical species being traded;
4. The potential creation of local water quality degradation caused by the locations of those projects providing water quality benefits;
5. Clear delineation of the water quality risks of the proposed trading program and steps to mitigate those risks;
6. The location of any specially designated water bodies, including Metropolitan No-Discharge Streams and Outstanding State and National Resource Waters, and how those restrictions will be addressed within the trading program;
7. Synchronization of permits within the trading area for point source to point source trades;
8. The defined point source to point source trading area need not correspond to that for point source to non-point source trades, but any differences need to be justified in the proposal;
9. The equivalency of water trading impacts and credits across any state boundaries. Formal agreements between the State of Missouri or the Missouri Clean Water Commission and the other state involved in interstate trading may be required before approval of a program proposing to accept interstate trades.

### **Element #3 - Trading Types**

Two types of water quality trades generally occur: Trades between two or more point sources; and trades between one or more point sources and non-point sources.

The State of Missouri allows either type of trade to occur and allows both to occur within a single water quality trading program. Each trading program should define which trades will be allowed.

The following should be addressed in defining the types of trades to be included in the program.

1. The benefits of each type of trades to be included;
2. Potential sources of water quality benefits from each type of trade;
3. Any risks created by including a trading type and how these will be addressed;
4. Any geographic or other limitations on one or the other type of trade, if considered.

#### **Element #4 – Chemical Species for Trading**

Water quality trading can be done for a number of pollutants. While some toxic chemicals are not eligible for trading because of acute toxicity or other reasons, most common chemical species can be traded. Missouri will allow trading of any chemical species allowed by the federal Clean Water Act if reliable estimates of attenuation exist for that species.

**REVISIT THIS DECISION IN FEBRUARY. FULLER DEFINITION OF SPECIES ALLOWED NEEDED**

Generally, Missouri will use loadings of chemical species as the basis for trading. Loadings of pollutants are averaged over one year to accommodate the seasonal nature of contributions from some sources. Any variation from annual loadings will have to be justified in the water quality trading proposal.

The following characteristics of species should be considered in establishing the species to be traded:

1. The exact chemical species to be traded and the units of measure for each;
2. Averaging period, if other than annual, must be clearly justified by the water quality goals for the trading program;
3. The process for providing equivalence between different forms of a given pollutant. For example, various forms of nitrogen may be present within a watershed, but one form (total nitrogen, total Kjeldahl nitrogen, nitrogen measured as nitrate, etc.) must be selected for measurement.
4. Cross-pollutant trading will need a strong justification and a clear, scientifically valid explanation of how the species interact in the watershed, how the program proposes to avoid negative water quality impacts of these trades, how conversions between the loadings of the two pollutants will be determined, and whether any of these factors varies with location within the trading area.

#### **Element #5 - Monitoring**

Each program will design and operate a monitoring network to measure water quality within the trading area. Most monitoring is anticipated to fall to the point source(s) involved in trading with the DNR having an oversight role.

Monitoring requirements will include point source monitoring to measure the loadings of species involved in trading. Each trading program proposal will also include a plan for water quality monitoring at implementation sites and at key sites within the included watersheds to provide a clear measure of the efficacy of the program.

Modeling is expected to be used for those agricultural practices through the Nutrient Tracking Tool or its equivalent where such models have been validated to control costs and to provide consistency in the valuation of individual practices and groups of practices. However, new practices may require monitoring to provide a good measure of their value to be developed.

Here are some potential considerations with respect to monitoring

- Locations of and loadings from point sources;
- Implementation monitoring of projects;
- Watershed-based WQ monitoring;
- Monitoring of potential sites of higher loading and or higher water quality risk to ensure anti-degradation requirements are met;
- Justification for the use of modeling vs. monitoring for non-agricultural practices or those practices not included in the tool being use to quantify the water quality benefits of agricultural practices;

#### **Element #6 - Baseline Performance Standards**

The baseline performance expectations for a point source are the permit conditions, where present, or average effluent quality without nutrient removal in the absence of a permit limit. If a facility installs nutrient removal ahead of a driver, it can accrue credits for trading consistent with timelines established in this framework.

For agricultural lands, the current condition sets the baseline as these properties are not currently regulated nor has any minimum standard been set for such lands. Trading program may consider the requirement that a conservation plan is in place on the farm where the BMP or other credit-earning activity will take place. Programs may also consider a gradual increase in baseline to increase performance expectations in the watershed.

**Considerations: To be completed.**

## **Element #7 - Time Term of Trades**

The time term of trade refers to the length of time that a specific water quality trade is in place. This depends on the period during which the practice or project improves water quality. It begins when a practice or project is implemented and the water quality benefit is achieved and continues until that benefit no longer exists or is no longer documentable. For some agricultural practices, the practice needs to be implemented or maintained each year, while other agricultural practices and most point source infrastructure projects have extended lifetimes providing a longer term for the trade which involves that project or practice. Trades have a minimum time of one year; the maximum time will depend on the practice/project.

The amount of credit earned by any project or practice may be held for up to two years after implementation before those credits expire. For annual practices, the holding time is one year. To provide an example, if an agricultural practice put in place in the spring of 2015, the credits earned by that practice can be used in either 2015 or 2016 if it is an annual practice, but until 2017 if it is a multi-year practice that, when properly maintained, provides water quality benefits for more than one year.

This applies retroactively as well, allowing early adopters to earn credits for their actions while not allowing water quality to deviate over time as a result of trading current loadings for historical reductions. It also allows a facility to build up credits in one year against possible higher rates of practice failure due to weather conditions the following year.

Many trading programs will create a portfolio of implemented practices and projects that earn credits. These practices and projects can have a mix of shorter and longer time terms as a way to mitigate the risk of project failure and changes in credit costs.

While the amount of credit earned by a given practice or project will change as more is learned about each one's water quality benefits, these changes in crediting for practices that provide a multi-year benefit to water quality will occur at the time of permit renewal for each point source as a way to provide stability and predictability of the trading environment.

The time terms for specific projects or practices will be included in the trading program ledger. In defining the time terms of trades, the following considerations should be addressed:

1. Aligning time terms with permit timeframes for those projects or practices with long time terms;
2. Effective time frames as well as the required maintenance periods for the agricultural practices and any point source projects involved in trades;
3. Method for the renewal of practices, especially those with short time terms;
4. Each program can create a changeable portfolio of projects and practices that suits its needs and the availability of projects that can earn water quality credits.
5. Note that some forestry practices take years to achieve their peak water quality benefit and may not earn full credit in years immediately following implementation.

### **Element #8 - Trading Margin**

Missouri does not definitive top ends for trading margins. The lower end of the margin for point sources is defined as the permit condition or other water quality-derived limit. The bottom end of the margin from non-point sources is the current condition of the field or other area where credits are proposed to be earned.

The following **considerations** were offered with regard to the trading margin to be used:

- EAP guidance on this topic as presented in the EPA **DOCUMENT FORMAL NAME**, in the Willamette report and at the workshop in Lincoln;
- Define the bottom of the trading range (baseline) if different than in element #6, above ;
- Define the top of the trading range, if different from defined above;
- The margin may vary with species to be traded; depending on permit limits or other local water quality conditions. It must be defined for each species to be traded.

### **Element #9 - Extreme Events**

Many extreme events are defined within permit conditions. In those situations, the permit condition applied to the trading program as well. A program can use a federal declaration for determining whether an extreme event has caused the failure of practices involved in trading.

For events where no formal definition of extreme exists, **WE NEED TO RESOLVE THIS PROCESS**.

After an extreme event, a program must recalculate its ledger and return to **compliance ...**

The following **considerations** were offered with regard to extreme events:

- The need to define an extreme event and incorporate it into the program;
- Extreme events are defined in many permits for rainfall events, but not so for other potential events;
- There is a temporal component to these definitions;
- The acceptance of a recovery time from an extreme event and how that impacts trading;
- Accomplishing the reporting and accounting of these events and their impacts.

### **Element #10 - Liability**

**The terms of a water quality trading program will be reflected in the permits of those entities buying credits as part of a plan to improve water quality. The permittee thus assumes some liability within a trading program. This liability and risk arise from the permittees reliance on the actions of third parties to perform the proposed practices or projects and to maintain those**

practices, as necessary to create the water quality benefits projected to accrue as a result of those practices.

The permittee must always have sufficient credits to meet their permit responsibilities. This is best assured by the purchase of reserve (or insurance) credits that can be used to offset the failure of a practice or project within the trading program. The water quality trading proposal should address the risk of project failure and the program's method of addressing this risk.

In the case that a permittee uses the clearinghouse established by the department, its liability is limited to the availability of sufficient credits in the trading area to satisfy the permit requirements.

A buyer, not using the clearinghouse, can choose to use any legal or financial instruments that are agreeable to both parties to clarify responsibilities as a way to reduce liability.

#### **Element #11 – Tracking of Credits**

It is the responsibility of all permitted facilities involved in water quality trading to maintain sufficient credits to meet its permit obligations at all times. These credits must be tracked clearly through a ledger that is open for review.

The department, through the Water Protection Program, has the authority to enforce this requirement through the permit conditions and the ability to audit the ledger to assure compliance. The department does not have the authority to enforce conditions on non-point source activities, but can review these to assure that the practices included in the ledger are in place and properly maintained.

For those water quality trading program that use the clearinghouse, tracking will be done through the clearinghouse.

#### **Element #12 – Enforcement of Conditions of Individual Trades**

**NOT COMPLETED YET.**

Legal means for point to point source trades

Use of existing state and federal auditing procedures of agricultural practices

Potential for farmer to farmer tie

Possible implications of using the clearing house

**ROLES AND RESPONSIBILITIES DISCUSSION WILL IMPACT THIS.**

#### **Element #13 - Trading Ratios**

Trading ratios will reflect a mix of factors that account for attenuation ratio (accounting for the in-stream chemical and biological reactions of some species of pollutants), equivalency ratio (different chemical forms of the same pollutant), uncertainty (loading uncertainties), estimated failure rates of practices, and a retirement ratio (kept to assure water quality improvement). Those proposing a trading program are encouraged to work with the department to determine an appropriate attenuation ratio.

Need to address the level of change in an agreement before it must go back to the Commission for approval of the change.

Monitoring to determine credits for new practices (WQT program and state role?)