

Missouri Water Quality Trading Framework

Version of April 11, 2016

Cover Letter

The Water Quality Trading Framework is being submitted to the Missouri Clean Water Commission for approval. 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 to the Department of Natural Resources for approval of their specific trading program by preparing a prospectus 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 is committed to making changes in the framework, as needed, based on these early experiences.

Starting in July of 2015, the department convened a stakeholder work group of those parties interested in voluntary water quality trading as recommended in the state Nutrient Loss Reduction Strategy (2014). The work 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 convener for these meetings and had staff participate as members of the work group. These discussions continued roughly monthly. During each meeting a small set of elements critical to establishing water quality trading were selected for discussion. The group developed considerations that needed to be addressed related to each of the elements. It also determined which of these elements 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 as a general guide to issues related to water quality trading (Willamette Partnerships World Resources Institute and National Network on Water Quality Trading, 2015.). The U.S. Environmental Protection Agency (EPA) guidelines for water quality trading (EPA, 2003) provided additional guidance. In September, roughly a dozen members of the work group traveled to Lincoln Nebraska to participate in a workshop on water quality trading sponsored jointly by the U.S. Department of Agriculture and the EPA.

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 June 20 until August 20, 2016. The Missouri Clean Water Commission will hold a hearing to accept public comments on July 13, 2016 at the Lewis and Clark State Office Building in Jefferson City 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 the Missouri Water Quality Trading Framework

This document sets forth the basic policy for water quality trading in Missouri. It defines the major elements that any entity that seeks to create a trading program will need to provide to the department in its water quality trading prospectus. The framework, when combined with the water quality trading procedures document, is designed to guide any organization through the process of developing a water quality trading program. Some of these elements in the prospectus will be reflected in the state operating permit for point source(s) involved in trading. The framework allows flexibility for implementing these elements in the prospectus in recognition of differences in water quality, basin geography, individual water quality drivers and local circumstances.

The Water Quality Trading Framework contains:

- A description of common infrastructure available to support trading programs;
- Descriptions of each element and the considerations that should guide decision-making for each element;
- References to key documents; and
- Definitions of the terms used

In response to interest in nutrient trading expressed during the development of the Missouri Nutrient Loss Reduction Strategy, the department established a stakeholder work 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 Clean Water Commission and department policy statement on such trading.

The department and a large majority of the stakeholders participating in this work group support the establishment of voluntary water quality trading programs in Missouri. The work group recognizes water quality trading as one of the tools to help meet local and state-wide water quality goals. The work group members also recognize that Missouri needs 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 those wishing to establish a water quality trading program a straightforward and economical way to meet water quality requirements.

In its discussions, the work 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 that outweighs the risks of trading as part of an overall water quality plan;

3. Minimize and balance risks to those buying and selling credits as well as risks to water quality;
4. Be based on the best science available and adjust to advances in understanding of practices, water quality impacts of actions and existing water quality in Missouri's lakes and streams; and
5. Ensure 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 (although such trades could also be done through permitting without a formal trading proposal);
2. as a bilateral trade between two or more point sources operated by different continuing authorities;
3. through trades organized and implemented by the local, permitted entity or their agent; or
4. through trades facilitated by the clearinghouse at the request of and in accordance with the water quality trading prospectus 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.

Nothing in this policy waives requirements of state or federal Clean Water Law, including antibacksliding and antidegradation provisions. Once a trading prospectus is approved by the Missouri Clean Water Commission, staff of the Operating Permits Section of the Water Protection Program will prepare a state operating permit or permits that include conditions that match those found in the approved prospectus.

Common Infrastructure

The department will make available to trading programs a suite of systems or capabilities that enable 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 or capabilities, each provides a set of functions that can reduce the amount of locally-supported infrastructure required for trading, particularly if point source to non-point source trading is anticipated.

The decision to support a centralized infrastructure was based on the following:

1. A common infrastructure supports water quality trading by lowering the costs to establish a water quality trading program. It achieves this by reducing administrative costs, particularly for point to non-point source trades. Using established systems, such as the

Missouri Soil and Water Information Management System (MoSWIMS) and the Nutrient Tracking Tool (NTT), a common infrastructure lowers the cost of operating a trading program. It also frees the point source from having to search for, form and monitor agreements with individual farmers.

2. It reduces risks for point sources that wish to engage in trading with non-point sources as the clearinghouse assumes the risks of individual practice failure.
3. It provides a stable market as new credits are created each year through the Soil and Water Conservation Program cost-share program.
4. The clearinghouse will track credits ensuring no discrepancies occur.
5. Because the producer pays for 25% of the practice cost and that fraction is not involved in trading, the department can use a lower trading ratio making water quality trading more economically attractive while ensuring that water quality is improved through the trading program.
6. Because there are no additional requirements beyond those of the cost-share program, agricultural producers have no additional requirements that would discourage participation in a trading program.

Missouri Soil and Water Information System (MoSWIMS)

The Missouri Soil and Water Information Management System (MoSWIMS) is a web-based system that automates cost-share procedures for the Missouri Soil and Water Conservation District offices. MoSWIMS is used to allocate funds by resource concern, obligate funds to cost-share contracts, and document payments made. MoSWIMS generates printable cost-share forms and various financial and management reports. Conservation practices can be “built” into MoSWIMS including a selection of components necessary for construction, qualifying criteria (questions that must be answered prior to beginning the contract), contract or per acre maximums, soil loss information, the watershed where the practice is located, etc.

MoSWIMS has the capability to track cost-share fund usage by the districts from the time funds are allocated until cost-share payment is made. MoSWIMS automates cost-share procedures for the 114 counties by generating standardized cost-share forms such as contracts, change orders, and contract payments. The contract is composed of multiple pages and contains the conditions of the maintenance agreement. It must be signed by the cooperator, technician, and a district board member. The contract payment is also composed of multiple pages and calculates the cost-share payment the cooperator is to receive.

MoSWIMS generates various financial and management reports for use by the Soil and Water Conservation District Commission, Soil and Water Conservation Program, and the Soil and Water Conservation District offices. Reporting can be generated statewide, or for individual soil and water conservation districts. Reports can track practices (e.g. Grazing System Water Development), components needed for construction of practices, allocations, status of cost-share funds, and hydrologic unit codes.

MoSWIMS is not available to the public because of computer and data security concerns and access is limited to department and Soil and Water District staff. Therefore, any trading program that wishes to engage in point source to non-point source trading while not using the common infrastructure will need to develop a financial tracking system.

Missouri Nutrient Tracking Tool

The Missouri Nutrient Tracking Tool (NTT) is a web-based field-level conservation practice assessment program currently residing at (<http://104.239.136.28/NTTG2/Default.aspx>), that uses the Agricultural Policy Environmental eXtender model (APEX) to measure the effectiveness of conservation practices in reducing nutrient and sediment runoff from farm fields. The NTT provides long-term continuous simulations of tillage operations, fertilization, cropping systems, and conservation practices based on local average weather conditions over the period of record. Outputs include average annual estimates of nutrient and sediment reductions and crop yield changes between baseline and alternative management systems for most federal and state conservation practices. A water quality focus group of state, federal and local stakeholders was formed to provide input during the Missouri NTT development process for use in validating and calibrating the model outputs to soil and weather conditions in Missouri.

Important features of the NTT include:

- Geographic Information System (GIS)-based, that uses site-specific soils, slope and weather data, including automatic selection of soil groups and the closest weather station to the delineated field;
- An improved version of the field-level runoff model, Agricultural Policy Environmental eXtender (APEX). NTT estimations are based on APEX (Williams et al., 2000), which was developed to simulate individual fields and whole farms. APEX has components for routing water, sediment, and nutrients across complex landscapes and channels to the field or farm outlet;
- Default cropping, tillage, and fertilization operations; and
- Options to create custom cropping, tillage and fertilization operations.

The NTT can be used to evaluate the effectiveness of a wide variety of farm conservation practices implemented through federal and state cost-share programs in reducing nitrogen, phosphorus, and sediment runoff from individual farm fields and in documenting the statewide success of these programs. Training and certification of soil and water conservation district technicians in the use of the new version of the NTT is currently being developed by the Missouri Department of Natural Resources - Soil and Water Conservation Program. The United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) is currently developing a national version of the NTT.

Clearinghouse

Two department programs (Water Protection Program (WPP) and Soil and Water Conservation Program (SWCP)) and the Environmental Improvement and Energy Resources Authority

(EIERA) will coordinate to serve as a mechanism for managing trades for the trading programs using information on agricultural practices gathered through the SWCP. This clearinghouse will collect funds from credit buyers and track trades to ensure that the buyer has sufficient credits to fulfill its regulatory requirements.

The clearinghouse will work in a manner similar to a water quality mitigation bank operating in accordance with Section 404 of the federal Clean Water Act in that it will collect fees and track credits purchased. Once full payment is made to the clearinghouse, the credits purchased are considered fully implemented and cannot be withdrawn, cancelled or otherwise voided.

The process for implementation of a trade through the clearinghouse is illustrated here:

1. A simple explanation of water quality trading will be supplied to those who sign up for cost share funding through the SWCP. Farmers/producers who participate in the cost-share program will be asked to opt out if they do not want to allow their practices to be used for trading. (The department will have to contact past implementers to affirm that they would allow their credits to be used should a community want to use those credits.) There is no financial commitment or liability for the farmer that is different from signing up for cost-share funding now.
2. A water quality trading prospectus is developed by the point source with collaboration from the WPP on factors such as attenuation, antidegradation, antibacksliding and any hot spot risks within the proposed trading area.
3. The clearinghouse collects information on practices within the trading area and determines whether sufficient credits are available and the cost of the required credits once the trading ratio has been applied. (Interactive with step 2.)
4. The cost of the credits is sent to the buyer who then decides whether to buy credits or to implement whatever project is required to meet regulatory requirements. The credits available reflect the roughly $\frac{3}{4}$ of the practice cost that comes from the Soil and Water Conservation and Parks Tax. The $\frac{1}{4}$ paid by the farmer is left untouched to help ensure water quality gains in the watershed and to avoid some much more complex questions about funding, etc. (Because the program pays state average costs rather than actual costs, the 75/25% ratio may not apply exactly to every practice.)
5. The credit buyer pays money into a fund to be managed for the purpose of ensuring water quality gains in the watershed. These funds and the resulting practices will be tracked by establishing a separate account within MoSWIMS.
6. When credits are purchased, the funds go into a designated account and the districts that includes part or all of the trading area are informed that additional funding is available through trading within that area.
7. Districts can then sign up additional farmers or add practices on farms within the trading area that are already in the cost-share program. As these practices are implemented on farms, the same rules apply as in the normal cost-share program, except the practice maximum on individual farmers may not apply.

Should the number of credits available approach the number needed to fulfill the permit requirements of a permitted point source, the clearinghouse shall inform the permittee and work with the department and the permittee to either implement additional credit-earning activities

within the trading area or to adjust the trading area (and associated trading parameters) to ensure compliance with the conditions of the applicants permit.

Attenuation modeling

The department encourages all those entities planning to create a trading program to work with the department to establish an attenuation ratio appropriate for their program. The determination of the attenuation factor is discussed in the trading ratio section, below. The determination of an appropriate attenuation factor must be completed as part of the development of the water quality trading prospectus.

Required Elements of a Water Quality Trading Proposal

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

Elements #1-6 should be based on local conditions and goals. Elements #7-9 have been defined at a state wide level, but should be noted within the prospectus. Elements #10-13 can be done locally or through the state Water Quality Trading Clearinghouse. If the entity proposing the water quality trading program does not plan to use the clearinghouse, it must explain how it will replicate those services and complete its reporting requirements as defined in both the prospectus and its operating permit.

Introductory Information

1. The owner(s) of the point source(s) and contact address(es) for all point source facilities proposed to be involved in water quality trading;
2. The name of the facility to be included in the trading program, its permit number and its address;
3. The location of the facilities using both a legal description and UTM coordinates;
4. For each facility, the receiving stream, the first classified stream and its Water Body ID (WBID) and the USGS sub-watershed number;
5. If done by a third party partner or contractor other than the trading program organization as defined in the water quality trading proposal approved by the CWC, define the role of third party in:
 - i. Assessing and validating practices or projects,
 - ii. Providing supporting services such as ledger, practice/project or financial oversight,
 - iii. Conducting water quality monitoring.

Element #1 - Water Quality Goal

The trading program must have a clearly defined water quality goal that serves as the reason for the establishment of the program. The goals statement must include details such as the location and causes of any impairment to 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, a watershed-based plan or other methods.

The following considerations may help define the water quality goal:

1. Any water quality impairments, their extent and the location of sources of pollution to the watershed upstream of and within the impaired water body;
2. The pollutants responsible for the impairment;
3. Permit requirements on point sources within the watershed;
4. The locations and discharges of other point sources within the watershed;
5. The location of any specially designated water bodies, including Metropolitan No-Discharge Streams and Outstanding State and National Resource Waters, and how those designations will be addressed within the trading program, including antidegradation considerations;
6. How the program will prevent violations of water quality standards in the trading area (watershed) as a result of trading.

Element #2 - Trading Area

Each proposed water quality trading program must define the area for trades. The trading area defines where trades may occur and must include the discharge point 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 applicants may need to address a broader range and higher number of concerns regarding the potential for local water quality degradation associated with larger trading areas. In addition, larger areas will result in higher trading ratios for those pollutants that are attenuated in aquatic systems.

The following details must be addressed in defining the trading area:

1. The justification of the trading 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 benefits will occur within and downstream of the trading area 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 permit requirements related to the pollutant species being traded;
4. Clear delineation of the water quality risks of the proposed trading program and steps to minimize and mitigate those risks;

5. Synchronization of permits within the trading area for point source to point source trades;
6. The compliance point for the trading program;
7. 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;
8. The equivalency of water quality trading impacts and credits across any state boundaries must be clearly determined and agreed to by the states involved prior to the approval of the trading program. Formal agreements between the State of Missouri or the Missouri Clean Water Commission and the other state involved in interstate water quality trading may be required before approval of a program proposing to accept interstate trades.

Element #3 - Trading Types

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

The Missouri Water Quality Trading Framework allows either type of trade to occur and allows both to occur within a single water quality trading program. Each trading program must define which trades will be allowed.

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

1. The benefits of each type of trade 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 risks will be addressed;
4. Any geographic or other limitations on either type of trade.

Element #4 – Pollutant Species for Trading

Water quality trading can be done for a number of pollutants. EPA, in its 2003 trading policy, noted the significant potential for trading in nutrients and sediments, but also supported trading of a wide variety of pollutants to improve water quality and provide ancillary benefits. While some persistent bioaccumulative toxic pollutants are not eligible for trading because of acute toxicity or other reasons, most common pollutants can be traded under the Clean Water Act. The Missouri Framework will allow trading of any pollutants allowed by the federal Clean Water Act if reliable estimates of attenuation exist for that species.

Generally, Missouri will use loadings of pollutant species as the basis for trading. Loadings of pollutants will be 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 prospectus.

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

1. The exact pollutant species to be traded and the units of measure for each;
2. The averaging period, if other than annual, must be clearly justified by the water quality goals for the trading program;
3. The process for determining the 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 trading and 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 conversions between the loadings of the two pollutants will be determined, and whether any of these factors varies with location within the trading area.
5. For species without accepted attenuation factors, the factors to be applied should be agreed upon in consultation with the Water Protection Program prior to the submission of a trading prospectus.

Element #5 - Monitoring

Each water quality trading program will design and operate a monitoring network to measure water quality within the trading area. Most monitoring is anticipated to be conducted by the point source(s) involved in trading with the department having an oversight role. A Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP) and must be included in the water quality trading prospectus for approval.

Monitoring requirements will include point source monitoring to measure the loadings of pollutants involved in trading. In addition, monitoring is expected at critical locations within the trading area, including in stream segments that are currently impaired or that could experience degraded water quality as a result of trading (potential hot spots).

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 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 in the context of water quality trading.

Potential considerations with respect to monitoring include the following:

- Locations of, and loadings of the traded or related pollutants from, point sources;
- Implementation monitoring of projects;
- Data quality assurance;
- Watershed-based water quality monitoring;
- Monitoring of potential sites of higher loading (i.e., hot spots) and/or higher water quality risk to ensure antidegradation requirements are met;

- Justification for the use of modeling vs. monitoring for non-agricultural practices or those practices not included in the tool (NTT or other) being used to quantify the water quality benefits of agricultural practices;
- QAPPs and SAPs must be submitted to and approved by the department prior to the implementation of any monitoring program. Example QAPPs and SAPs are available from the WPP by request.

Element #6 - Baseline Performance Standards

The baseline performance expectations for a point source are the permit conditions, where present, or highest attainable effluent quality without nutrient removal in the absence of a permit condition. If a facility installs nutrient removal before it is a regulatory requirement, it can accrue credits for trading consistent with timelines established in Element #7 of 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. Each trading program may consider the requirement that a nutrient management plan be in place on the farm where the BMP or other credit-earning activity will take place. Trading programs may also consider a gradual increase in baseline to increase performance expectations in the watershed.

Considerations: To be completed after discussion about NPS.

Element #7 - Time Term of Trades

The time term of trade refers to the length of time that a specific water quality credit is available for trading. 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 each year, while other agricultural practices and most point source infrastructure projects have extended lifetimes, if properly maintained, 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 water quality 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 time term is one year after implementation. To provide an example, if an agricultural practice is implemented 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 be negatively impacted over time as a result of allowing current loadings to be compensated by historical reductions. It also allows a facility to build up credits in one year against the risk of practice failure due to weather conditions in a later 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.

The amount of credit earned by a given practice or project will change as more is learned about each one's water quality benefits. 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 to 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 trading program can create a changeable portfolio of projects and practices that matches its needs and the availability of projects that can earn water quality credits.
5. Note that some practices (i.e. forested buffers) take years to achieve their peak water quality benefit and may not earn full credit in the years immediately following implementation.

Element #8 - Trading Margin

Missouri does not define upper 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 lower end of the margin for 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:

- EPA guidance on this topic as presented in the 2003 EPA Water Quality Trading Policy and in the Willamette report (2015);
- Define the lower end of the trading range (baseline) if different than in Framework Element #6, above;
- Define the upper end of the trading range, if different from Framework Element #6, 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 may be applied to the trading program as well. Alternatively, a trading program can use a federal declaration for determining whether an extreme event has caused the failure of projects or practices involved in trading.

For point source to point source trades, the two point source operating authorities must propose a method for addressing extreme weather events and implement that method through legal agreement or permit conditions agreed up on by the department.

For those trading programs using the clearinghouse, the inclusion of known practice failure rates in the trading ratio provides coverage for practices that are negatively impacted by extreme weather events.

For any non-point source practices purchased outside the clearinghouse, the permitted authority must propose a method for addressing extreme weather impacts on the non-point source practices in order to have proper terms and conditions written into its permit.

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

- Extreme events are defined in many permits for rainfall events, but not so for other potential events;
- There is a temporal component to these events and their definitions;
- The recovery time from an extreme event and how the reduced effectiveness of practices during that period impacts the credits available for trading;
- The applicant must provide a method for reporting and accounting for these events and their impacts, if implementing trading outside the clearinghouse.

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 may assume some liability within a trading program. This liability and risk arise from the permittee's 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 its permit responsibilities. This is best ensured 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. Once a credit is purchased through the clearinghouse, the permittee has transferred the responsibility to the clearinghouse in a manner similar to that which occurs when an entity purchases credits through a mitigation bank under Section 404 of the Clean Water Act.

A permittee/credit buyer not using the clearinghouse can choose to use any legal or financial instrument that is agreeable to both parties and approved by the department to clarify responsibilities as a way to address the assignment of liability.

Element #11 – Tracking of Credits

It is the responsibility of each permitted facility 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 permit conditions and has 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 activities to ensure that the practices included in the ledger are in place and properly maintained.

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

Element #12 – Enforcement of Conditions of Individual Trades

Point source to point source trades must be accompanied by a binding agreement between the parties that addresses the terms for trading and the contractual and operational expectations of each party.

For the entities that use the clearinghouse for point source to non-point source trades, the conditions of the contract for the agricultural producer are those found in the Cost Share agreement. The point source has no role in enforcement as any failure to complete the contract will be handled through the Missouri Soil and Water Conservation District Commission procedures.

For those point sources that wish to trade with any non-point source while not using the clearinghouse, the permitted entity assumes responsibility for having enough credits in place at all times. If a contract violation or practice failure leads to the permittee having insufficient credits, the permittee is in violation of the terms of its permit and can face penalties under the federal Clean Water Act and Missouri Clean Water Law (Sections 644.006 – 644.141 RSMo). For trades occurring outside the clearinghouse, the permitted entity must provide a method of verifying agricultural practices and maintenance of those practices as part of its trading proposal.

Element #13 - Trading Ratios

Trading ratios will reflect a combination of factors.

The delivery ratio factor accounts for attenuation (the in-stream chemical and biological reactions of some species of pollutants) and depends on the stream size and structure within the trading area. The second factor reflects the risk of practice failure and extreme events that compromise practice effectiveness. A third factor will address the uncertainties in practice effectiveness, pollutant attenuation and estimates of failure rates. Finally, an equivalency ratio will be determined for those trades that involve different chemical forms of the same pollutant. Those proposing a trading program are encouraged to work with the department early in the process to determine appropriate factors to be applied in determining trading ratios.

These factors can be combined into a single ratio for the entire program or be calculated on a trade-by-trade basis. In the former situation, the trading area will be assessed and a trading ratio assigned to the trading program with the same ratio used throughout the trading area. Alternatively, a trading ratio can be calculated for each trade based on the relative locations of the sites and the structure of the streams between them. The former is simpler and less expensive to implement, while the latter is more precise in its calculations and may reduce credits required by allowing the sites and practices chosen to be optimized, but will cost more to implement.

The general formula for calculating the trading ratio is: Delivery Ratio times Practice Failure Ratio times Uncertainty Ratio times Equivalency Ratio, where required).

Determination of Credits

The department has the authority to determine the number of water quality trading credits for any project or practice. Credits for point source projects will be determined using the best available data from similar systems currently in operation. Credits for agricultural non-point source practices will be determined using NTT, if a value for the practice has been determined using NTT. For any agricultural practices for which no value exists in NTT, the department will use available data to determine the credit for that practice.

Additional assessments of the water quality impacts of many practices are currently under way and changes can be expected in the number of credits earned by a specific practice at a given location over time. In addition, the water quality benefits of additional practices can be added to NTT as these benefits are documented. The water quality value of practices for water quality trading purposes will change at the time of state operating permit renewal for the point source facility engaged in trading. This means that the same practice may have a different value for a short time in different trading areas, but provides a more predictable trading market.

Accounting for Ecosystem Services

Many projects that could be involved in water quality trading also produce other ecological benefits. For example, a forested stream buffer could also qualify for carbon credits within such a market.

Nothing in this framework prevents projects involved in trading from earning credits under other programs, except that no project may claim credits within two different parts of the Clean Water Act. For example, a project would not be awarded water quality credits for a project under Section 404 for stream or wetland mitigation and also be awarded the water quality credits within a trading program. Should an entity want to assign the ecological value of a mitigation project for the purposes of Section 404 of the Clean Water Act and the water quality benefits to a water quality trading program, the clear distinction between those two sets of credits would have to be submitted to and approved by both the department and the designated U.S. Army Corps of Engineers office before use.

References

Missouri Nutrient Loss Reduction Strategy, 2014. <http://dnr.mo.gov/env/wpp/mnrsc/docs/nlrs-strategy-2014.pdf>.

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.pdf>.

Williams, J. R, J. G. Arnold, and R. Srinivasan. 2000. The APEX model. BRC Report No. 00-06. Temple, Texas: Blackland Research Center.

U.S. Environmental Protection Agency, Water Quality Trading Policy, 68 Fed. Reg. 1608,(Jan. 13, 2003) (final policy), available at: <http://www.gpo.gov/fdsys/pkg/FR-2003-01-13/pdf/03-620.pdf>.

Definitions:

Adaptive Management – A systematic approach, used in natural resource management, to improve an ecological system in response to additional information by incorporating the new knowledge into the decision-making process. 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 agricultural best management practices.

Annual Practice – A best management practice that provides a water quality benefit during the year it is implemented, but does not have a provable, longer term impact on water quality. Such practices require action beyond mere maintenance to provide water quality benefits on a continuing basis.

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 (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. The eligibility and water quality trading value of any proposed non-agricultural practices will be determined by the Water Protection Program.

Credits – The measured or estimated unit of pollutant 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 specified point.

Bi-lateral trades – Trading involving two point sources in which one facility improves water quality beyond its permit requirements and sells credit for that extra improvement to another facility.

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 practices and groups of practices. In addition, the Environmental Improvement and Energy Resources Authority (EI ERA) will operate a standardized ledger that contains all of the practices eligible for purchase by location. The Water Protection Program will work with applicants to determine the proper attenuation values based on the trading area and the stream structure within that trading area.

Ecosystem Services – Positive direct or indirect benefits to humans from the natural resources, including drinking water protection, wildlife support and recreation.

Environmental Improvement and Energy Resources Authority – A quasi-governmental agency that helps finance pollution control projects, issues tax-exempt bonds, provides technical assistance on the use of recycled materials and conducts research on environmental issues.

Hot Spot – 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 points 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.

Hydrologic Unit Code (HUC) – A hierarchical system, created by the US Geological Survey, which defines watersheds using a numerical code. A larger number of digits in the code indicates a smaller watershed. For example, the Gasconade River is an 8-digit HUC (10290203) that contains roughly 30 smaller HUC-12 watersheds. The department does watershed planning at the HUC-8 level. There are 66 HUC-8 watersheds partially or entirely contained within Missouri.

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 the credits it earns 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.

Missouri Soil and Water Information System (MoSWIMS) – A computerized system that tracks financial information about practices implemented using cost share. The system allows data entry from the Soil and Water District employees as well as SWCP staff.

Non-Point Source – Pollutants originating from a dispersed land area, not from a specific point, which often are carried by surface run-off. Non-point source pollutants are not generally regulated by the federal Clean Water Act, but are addressed through incentive-based methods of reduction.

Nutrient Tracking Tool – A validated, computerized system for estimating pollutant reductions that will result from a single practice or set of practices on agricultural lands. NTT can be operated by Soil and Water Conservation District employees and SWCP staff who have been trained in its use.

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

Point Source – A single, defined location from which a water pollutant or pollutants may be discharged. Under the federal Clean Water Act, pollutants from point sources are regulated.

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 water quality performance than would otherwise be required. The owner of the first point source is compensated for this higher performance by the latter point source owner.

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 implementing a project or projects at the point source.

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.

Prospectus – The formal application that details the critical elements of a proposed trading program to establish a water quality trading program. This is submitted to the Missouri Clean Water Commission for approval.

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.

Soil and Water Conservation Program (SWCP) – A program within the Department of Natural Resources that works with soil and water districts and agricultural producers to reduce soil erosion and improve water quality through the implementation of best management practices.

Traded Pollutant – The chemical to be involved in trading. If a multiple forms of that chemical are found in water, the trading program may need to explain how it intends to mathematically convert other forms of that chemical into the specie to be traded.

Total Maximum Daily Loads (TMDL) – A calculation of the maximum amount of a pollutant that a body of water can receive and still meet all applicable water quality standards including an allocation of pollutant loadings to point sources and non-point sources within a watershed.

Trading Area – A geographic area within which credits can be bought and sold. It contains all of the projects and practices as well as the point source buying water quality credits. Trading areas are defined 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 Margin – The number of credits that a buyer must purchase based on the regulatory minimum standard set. It may be based on technology or water quality standards.

Trading Program – A watershed-based effort in which regulatory requirements and water quality goals are met by reducing pollutant loads at one or more locations in exchange for lesser reductions at a permitted facility or group of permitted facilities.

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

Water Protection Program – The program within the Department of Natural Resources overseeing water quality efforts in Missouri. Its Water Quality Assessment, Permitting and Engineering Sections have roles in water quality trading.

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

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 HUC-8 watersheds as the basis for its watershed planning (Our Missouri Waters) efforts.