REGIONAL RECOMMENDATIONS ON WATER QUALITY TRADING

Prepared By:
Willamette Partnership
The Freshwater Trust

Under a USDA Conservation Innovation Grant Award

In Collaboration With:
Idaho Department of Environmental Quality
Oregon Department of Environmental Quality
Washington Department of Ecology

Advised by:
US EPA Region 10

DRAFT

Table of Contents

Executive Summary 4
I. Introduction 16
II. Guiding Principles for Water Quality Trading 18
III. Recommendations 21
1. Eligibility for Water Quality Trading 21
1.1 Eligible regulatory trading environments 21
1.2 Regulatory instruments that drive trading 24
1.3 Eligible Credit Buyers 37
1.4 Trading Area 39
1.5 Eligible pollutants and Units of trade 39
1.6 Eligible Credit-generating actions and BMP Guidelines 40
1.7 Approving new and modified best management practices 41
2. Determining Baseline & Additionality Requirements 43
2.1 Deriving Baseline requirements 45
2.2 Detailing Trading Baseline at Individual Project Sites 50
3. Quantifying Water Quality Benefits at the Project Site 57
3.1 Characteristics of a Credit Quantification Method 58
3.2 Standard methods quantifying water quality improvements for trading 59
3.3 Quantifying conditions at the field-scale 63
3.4 Project site assessment 64
4. Adjustments to Water Quality Benefits 69
4.1 Delivery and Attenuation of Water Quality Benefits 69
4.2 Developing Trading Ratios 72
4.3 Reserve Pool 77
5. Credit Characteristics 79
5.1 Credit Life 79
5.2 Are Credits property rights? Are Credits capital assets? 83
5.3 Relation of water quality trading to other programs – Proportional Accounting, Credit Stacking & Payment Stacking 84

DRAFT

6. Project Implementation & Quality Assurance Standards 90
6.1 Initial project Site Screening(or "Validation") 90
6.2 Consistency with other laws 90
6.3 Project implementation quality assurance 91
6.4 Project design and management plans 92
6.5 Project stewardship – adequate legal protections and stewardship funds 92
7. Project Verification & Certification 94
7.1 Verification of Project Sites and Credits 95
7.2 Project site Verifiers 95
7.3 Content of initial Verification 96
7.4 Frequency and content of ongoing Verification 96
7.5 Certification 97
8. Registration 99
8.1 Public disclosure and serialization of Credits 99
8.2 Information for public disclosure 100
9. Compliance Determination & Enforcement Actions 102
10. Roles & Responsibilities in Program Administration 103
10.1 Roles and responsibilities in Trading Framework or plan administration 103
10.2 Roles for Initial Screening 107
10.3 Roles for Verification 107
10.4 Roles for Certification 108
10.5 Roles for Registration 109
10.6 Roles for Standards Development 109
11. Adaptive Management & Tracking Effectiveness 111
11.1 Improving trading program standards, protocols, and process 111
11.2 Improving Quantification Methods 112
11.3 Effectiveness Monitoring 113
IV. Conclusion 116
V. Glossary 117
VI. Appendix A. Components of BMP Guidelines 127

DRAFT

Executive Summary

Commented [BC1]: REVIEWERS: This is your first view of the Exec Summary. It's our attempt at something that could be a standalone. We extracted the Statement into a separate document, so they are not connected.

We also did not put agency logos on the front. We're OK not doing that, but please let us know what your preference is. As much as is comfortable, we want to brand this as a joint product, since it is.

The draft Recommendations document is based on discussions between the Idaho Department of Environmental Quality, the Oregon Department of Environmental Quality, the Washington Department of Ecology, and the U.S. Environmental Protection Agency (EPA) Region 10, with Willamette Partnership and The Freshwater Trust facilitating discussions and document development. The ideas, principles, and practices in the following pages should be considered DRAFT, and not as the consensus position of the group or the position of any one participant.

The goal of this effort is to help ensure that water quality trading has the quality, credibility, and transparency necessary to be consistent with the Clean Water Act (CWA), its implementing regulations, and state and local regulations, while also achieving water quality improvements. By identifying recommended approaches to critical components of water quality trading, this effort may also serve to increase the confidence of participants and observers that trades produce their intended Water Quality Benefits[1] and comply with applicable regulations.

The principles and practices included in this draft Recommendations document build from the 2003 U.S. EPA Trading Policy[2] and cover each recommended component of a successful water quality trading program. The document is written to meet the needs of state water quality agencies and those leading the design, development and implementation of trading programs, which may be trading "guidance" (state-level rules, policy, guidance), "frameworks" (Watershed-level) and "plans" (permittee-level). The practices should also be useful to participants in trading—Point Source Buyers, sellers, environmental organizations, and other third parties.

The draft Recommendations document also includes Guiding Principles to help steer agencies and stakeholders in making key decisions. It also provides background context and commentary for each of the Recommendations and details when it might make sense to design a trading program differently. The topics covered in this document are shown in the diagram below, which are also

[1] Throughout this document, defined terms will be capitalized. Definitions can be found in the Glossary (Section V).

[2] EPA, Water Quality Trading Policy, 68 Fed. Reg. 1608, 1609 (Jan. 13, 2003), *available at* http://waterepa.gov/type/Watersheds/trading/tradingpolicy.cfm.

Appears in the footer of each section of the draft Recommendations document to orient the reader. All topics are also briefly reviewed in this Executive Summary.

Principles for Water Quality Trading

Water quality trading is just one tool of many that may be used to help achieve the goals of the CWA, and other public objectives.[3] Trading is not appropriate for many water quality challenges, and stakeholders must evaluate its efficacy before assuming it can be useful in every Watershed. However, when designed to include appropriate safeguards, trading programs can help achieve water quality goals in a way that is beneficial for permittees, landowners, communities, and the environment.

The Guiding Principles in the draft Recommendations document can assist agencies and stakeholders in making key decisions when designing and launching trading guidance, frameworks and plans. Water quality trading is generally supported when it allows sources to more effectively comply with their allocations and permit Effluent Limits in a way that is consistent with the 2003 U.S. EPA Trading Policy, the CWA regulatory framework, and other relevant regulations. Trading should also be based on sound science such that it utilizes the best available methods to quantify Water Quality Benefits and does not produce localized water quality problems. Finally, trading should be structured in a way to ensure that the promised water quality improvements are delivered, and should seek to do so with predictable and reasonable costs.

Eligibility for Water Quality Trading

Regulatory Environments and Regulatory Instruments to Drive Trading

Trading is not appropriate for every Watershed or in every situation. Eligibility guidelines for Buyers and sellers can provide clear direction as to when and where trading is acceptable and when and where it is not. Consistent with the 2003 U.S. EPA Trading Policy, trades in the Northwest are expected to most often occur under individual, reissued NPDES permits in basins covered by an approved Total Maximum Daily Load (TMDL) or a similar Watershed analyses. Subject to agency discretion and conformance with the CWA and its implementing regulations, trades outside of a TMDL may be possible, but may require additional analysis. Trades should be consistent with relevant Water Quality Standards, including Anti-Degradation, Anti-Backsliding and human or aquatic life provisions, and should not create localized water quality impacts (sometimes called "pollution hotspots"). Point Sources cannot trade to meet their technology-based Effluent Limits unless explicitly authorized by EPA regulations.

Commented [BC2]: REVIEWERS: Throughout, we capitalize defined terms. Some sections use a lot of defined terms. We'll take a crack at decreasing the number of capitalized terms on the last pass.

[3] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1609 ("Water quality trading is an approach" to "[f]inding solutions to [] complex water quality problems.").

Trading Areas and Credit Generating Actions

Trades should only be valid within a defined Trading Area for that Buyer. For example, regulators may determine that Buyers need to purchase Credits upstream of the Point of Concern in their Watershed, which may be located downstream of their discharge. All types of Buyers, including those without regulatory requirements, should be allowed to purchase Credits. Credits purchased by Buyers can be generated from in-stream or on-farm conservation and restoration actions, collectively referred to as Best Management Practices ("BMPs"), so long as the associated Water Quality Benefits are quantified and Verified. A pre-approved list of eligible BMPs may make it clearer and easier for trading to focus on the most relevant BMPs. Each pre-approved BMP would then contain guidelines that describe quality implementation standards, a method for quantifying Credits, and maintenance obligations. Trading Guidance and Frameworks should also consider including a process for evaluating and incorporating new types of BMPs.

Incorporating Trading in NPDES Permits

In order to demonstrate permit compliance, provide the details needed to ensure BMPs will provide Water Quality Benefits, and to provide sufficient detail for enforceability, a permit that includes trading should also contain all or some of the following elements:

- The applicable Trading Area and the eligible types, quantity, and units of Credits needed to offset a permittee's water quality based Effluent Limits;
- A detailed trading program plan ("Trading Plan") in the permit or as a separate, publicly noticed attachment to the permit,
- The reporting requirements, timing, and contents of a permittee's discharge monitoring report ("DMR") and other potential reporting requirements; and/or
- Compliance schedules.

When developing the Trading Plan, permit writers should also include: (1) a list of eligible BMPs for generating Credits, (2) acceptable methods for quantifying Water Quality Benefits, (3) "Baseline," (4) Trading Ratio and risk mitigation requirements, if applicable, (5) Quality Standards for BMP design, implementation, and performance, (6) requirements for project Verification, Certification, and Registration, and (7) requirements for legal project and financial protection. Further detail on these permit conditions may be provided in the Permit Evaluation Report. Permit writers and permittees can look to Watershed Trading Frameworks or statewide Trading Guidance to inform a permit's Trading Plan. Even if a permittee relies on other entities to develop or implement its Trading Plan, ultimately, the permittee bears the regulatory liability for ensuring that Credits are functioning.

Determining Baseline & Additionality Requirements

Deriving Baseline Requirements

"Baseline," or the threshold a Nonpoint source is required to meet before trading, is one of the most challenging aspects of water quality trading. Setting Baseline for trading is challenging because it requires answers as to what Nonpoint sources are *required* to do, versus what they

should and reasonably *can* do. Answers to these questions are bigger than trading—which is a small, but important part of a broader strategy to reduction pollution from both Point and Nonpoint Sources—and consensus is difficult to obtain.

While it is generally agreed that Nonpoint Sources must meet "Baseline" prior to trading, it can be difficult to determine whether a particular Watershed goal, law, or regulation actually imposes an actionable control *requirement* on an individual Nonpoint Source. Many sources generally describe Baseline requirements; for example, the 2003 U.S. EPA Trading Policy states that "pollutant reductions [should be] greater than those required by a regulatory requirement or established under a TMDL[,]"[4] and the 2007 U.S. EPA Trading Toolkit notes that Nonpoint Source Baseline "can be derived" from TMDL load allocations ("LAs"). However, regulators still must translate applicable land use and management practices regulations ("Regulatory Baseline"), TMDL documents, general state Nonpoint Source control authority, and social objectives into site-specific Nonpoint Source Baseline requirements. Each state may decide to combine these sources of authority in different ways to derive the "Trading Baseline" applicable to a particular trading framework or plan. At a minimum, all Nonpoint Sources should meet Regulatory Baseline requirements, which are typically affirmative obligations or non-disturbance regulations (e.g., all farms must have nutrient management plans in place, or riparian vegetation may not be actively disturbed). However, if a TMDL or general state Nonpoint Source authority exists, or a state wishes to impose a requirement that actions must be above a Nonpoint Source's status quo operations, a state can also choose to set its Trading Baseline at a level above Regulatory Baseline.

When determining whether a TMDL imposes site-specific obligations above Regulatory Baseline, one must look to TMDL Implementation Plans. Because TMDLs themselves are informational, it is up to states and agencies that implement TMDLs to set the site-specific implementation requirements that may be added to the Trading Baseline. If trading may be used to help meet water quality goals in a Watershed, then considering how several actions may affect trading early on in TMDL development will make it easier to set a Trading Baseline later on. These actions include clearly defining Load Allocations, examining the expected role of trading in achieving TMDL goals, and making clear statements about the role and timing of trading in implementing the TMDL. Currently, many TMDL Implementation Plans lack clarity as to when desired future conditions will be attained, and when and what sequence of actions will be necessary to reasonably assure progress toward Water Quality Standards over the longer-term. Without such specificity, it may not be clear how to set Trading Baseline or which entity will address what amount of the problem during TMDL implementation and by when. (For example, would LAs need to be met in 5 years or 75 years? How much load must be reduced before trading can occur?)

[4] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610.

Some states may have general, broad authority to control Nonpoint Source pollution,[5] which can be used to influence Baseline levels for a particular Watershed or Trading Program. Similarly to TMDL LAs, general state Nonpoint authorities may not always establish clear BMP or management requirements to incorporate into Trading Programs. In addition, some states may choose not to give credit for BMPs that are already customary to the industry, or that were already planned because of immediate cost savings for the Nonpoint Source operator.

Implementing Baseline Requirements

Trading Frameworks and Plans should identify a "Base Year" after which Credits can be generated. Conservatively, the Base Year can be the year a seller enrolls its project in an approved Trading Framework or Plan. It may also take the form of the date of TMDL issuance or similar Watershed strategy informing allocations. In some cases, sellers may be allowed to sell Credits from prior existing projects if the developer of that project can: A) document consistency of the project with all applicable trading requirements, and B) demonstrate that the project was implemented after the chosen Base Year or another appropriate date selected by regulators.

The Trading Guidance, Framework or Plan should also detail how Baseline and other Additionality criteria are expressed:

- Baseline requirements may be expressed as "technology-based" (a minimum set of BMPs), as a "performance-based" requirement at the Nonpoint Source site level (e.g., percentage or numeric load reduction target), or as a "performance-based" requirement at the Watershed level.
- Sellers only need to meet their own Baseline requirements—they need not wait for full participation from neighboring landowners prior to trading (though Trading Programs might consider incentives for collective implementation of BMPs).
- Sellers may implement BMPs that simultaneously meet their Baseline requirements and generate Credits (i.e., no need to first install a project to meet Baseline requirements, and then undertake a separate Credit generating activity).
- Cost share dollars ("Public Dollars Dedicated to Conservation," such as Farm Bill Conservation Title, CWA section 319 funds, or state conservation funds) may be used to help landowners meet Baseline requirements, but the use of such funds should be disclosed and carefully accounted for.

Quantifying Water Quality Benefits

[5] *See, e.g.,* RCW 90.48.080 ("It shall be unlawful for any person to throw, drain, run, or otherwise discharge into *any of the waters of this state*) (emphasis added). Washington Ecology authority to regulate nonpoint sources under this law was recently upheld by the Washington Supreme Court. Lemire v. Washington, No. 87703-3 (2013).

Water Quality Benefits are the pollution reductions directly attributable to the BMPs. Through the use of best available science, Credit Quantification Methods and tools can predict and, depending on the tool, measure the pollution reduction from implemented BMPs. These reductions are then translated into Credits. Credits are thus a function of the pollution reductions at the edge of a field, adjusted for delivery into and Attenuation through a waterway, application of Baseline or eligibility requirements, and adjustments via Trading Ratios.

To quantify Credits, a seller should first document a site's "Pre-Project Conditions" at the Base Year in a way that can be independently verified. After the action is complete, a seller may then document or estimate the site's actual or anticipated "Post-Project Conditions." These conditions are then translated into what is termed "Site Performance." The difference between Pre-Project Performance and Post-Project Performance is the "Water Quality Benefit" that is generated from the installed BMPs.

This Water Quality Benefit can be quantified in a number of ways, each with certain advantages and disadvantages. Quantification Methods may include pre-determined BMP effectiveness rates, Water Quality Modeling, or direct measurement monitoring at sites. Regardless of the approach taken, however, the methods used to quantify Credits should be repeatable, sensitive, accurate, practical, and transparent. Furthermore, they should be well-documented, include a thorough technical review, and contemplate a plan for improving the method over time. Moreover, each Trading Framework or Plan should identify and use standard methods, with clearly defined versions approved by regulators for use.

Adjustments to Quantified Water Quality Benefits

Water Quality Benefits at the project scale are often adjusted based on pollutant transportation through a waterway and to also manage for any risk and uncertainty. Delivery and Attenuation factors, Trading Ratios, and Reserve Pools are common adjustments made to Water Quality Benefits before arriving at a final Credit quantity (states may also choose to discount Water Quality Benefits by Baseline at this stage).

Delivery and Attenuation of Water Quality Benefits

After the edge-of-field Water Quality Benefits have been quantified, additional calculations are often used to estimate how much of the pollutant is transported from the point at which it is generated to the point of concern downstream. In some cases, it is necessary to understand how much of the pollutant load is delivered from the field into the waterbody. It may also be necessary to account for instream Attenuation of pollutants, which is the change in pollutant quantity as it moves from a point upstream to a point downstream.

Accounting for delivery and Attenuation may occur as part of a TMDL (e.g., modeling Attenuation), through Trading Ratios, or through BMP eligibility rules (e.g., requiring eligible fields to have a direct hydrologic connection to a stream as a proxy for delivery to the waterbody). Where possible, the approaches used to estimate delivery and Attenuation should be consistent with those used to estimate edge-of-field Water Quality Benefits.

Trading Ratios

A Trading Ratio is a value used to adjust the Water Quality Benefits from a particular project to account for various factors, such as Watershed processes (e.g., Attenuation), delay in BMP maturation, programmatic risk, uncertainty (both in terms of measurement error and project performance), net environmental benefit creation, and/or ensuring equivalency across types of pollutants. Some of these factors may be directly incorporated in the quantification of Water Quality Benefits instead of as Trading Ratios. Trading Ratios should be tailored to the applicable Credit type and analyzed scientifically for appropriateness. Where specific policy objectives such as Watershed goals, economic feasibility, or appropriate levels of risk need to be considered, it may be appropriate to incorporate these considerations into Trading Ratio decisions. Ratios can be applied on the Buyer side, and then generally require that the Buyer acquire an extra amount of Water Quality Benefits.

The assumptions underlying the chosen ratio should be carefully documented in a transparent manner in the applicable regulatory documents, such as an individual permit, relevant TMDL, or Trading Framework or Plan. Where ratios are set for individual trades, ratios should be developed according to a consistent approach. Where Trading Ratios contain multiple components, they may be applied separately or combined into a single factor. The various combined ratios applied to a Point Source should be greater than 1:1 such that for every unit of pollution discharged by a Point Source, it must generate or purchase more than one unit through BMPs or other Credit generating activities.

Reserve Pools

Other trading programs in the United States have recently established Reserve Pools of Credits to programmatically manage the risks stemming from uncertainty and project failure. A Reserve Pool is typically populated by applying a reserve ratio to each Credit-generating BMP project. If a Reserve Pool is used, the trading program needs to define who manages the reserve, how the pool will be populated over time, the circumstances under which a Buyer may access Credits, the rules regarding when Credits must be permanently purchased versus temporarily loaned, and a mechanism for dealing with the accumulation of Credit surpluses.

Credit Characteristics

Trading Guidance, Frameworks, and Plans should define the essential characteristics of a Credit. Credits are not property rights as they can be issued, approved, and taken away by agencies. Once certified, however, they are tradable goods with an ascertainable value, and so may be considered "Capital Goods" by Credit Buyers.

Project Life and Credit Life

A given BMP will start producing Water Quality Benefits at a certain time, and will continue to provide those benefits for a particular length of time. Credits generated from a BMP or other activity may only be considered valid if the project is installed and Verified according to Quality Standards and is functioning as expected. The period of time over which a BMP is expected to

perform is known as the "Project Life." Non-structural, practice-based BMPs (e.g., cover crops) may only produce Water Quality Benefits for a handful of years, whereas structural BMPs such as riparian forest restoration may produce Water Quality Benefits for decades or longer. Typically, the Buyer and seller will enter into an agreement, contract, lease, or easement that will protect the installed BMP for the duration of the project life ("Project Protection Period"). After the initial Project Life expires, Credits can remain valid if the BMPs continue to function, are still protected by a protection agreement, and are maintained according to applicable performance standards.

A Credit becomes valid when a BMP is installed and Verified. A Credit can be used by a Buyer only during its approved and Verified period of performance, or "Credit Life." Regulators can set the default Credit Life for a given tradable pollutant consistent with the time period during which the Water Quality Benefit is needed. For example, the default Credit Life within a Trading Framework could be tied to the Critical Periods identified in a TMDL or to an annual cycle. This may be appropriate where permit limits are expressed as annual loads or where analysis shows that reductions in pollutant load from any point in the year are effective at improving water quality during the critical period (e.g., reductions in phosphorus loading at any point in the year contribute equally to improving dissolved oxygen during the Critical Period).

Payment Stacking and Credit Stacking

Trading programs should provide clear guidance on the ability to use multiple funding sources to generate Credits (i.e., "Payment Stacking"). Project Developers may rely on multiple sources of funding, but need to demonstrate that all Credits sold from the site are still Additional. One way to simplify this analysis is for Project Developers to disclose their funding sources. In addition, Project Developers can avoid the question by not using "Public Dollars Dedicated for Conservation" (which includes Farm Bill Conservation Title, CWA section 319 funds, or state conservation funds, but excludes public loans and ratepayer funds) to pay for a portion of a project generating Credits. For example, if a seller uses Farm Bill or other Public Dollars Dedicated for Conservation to pay for 50% of a project, then a seller may only sell 50% of the total Credits generated from the site. Leveraging Public Dollars Dedicated to Conservation with Credit financing to treat larger areas, install additional BMPs, or enhance BMPs can be an important strategy for expanding the impact of restoration work.

Trading programs should also address whether other types of environmental Credits generated from the same BMP on the same land may be simultaneously sold (often known as "Credit Stacking"). Similar to Payment Stacking, programs should provide clear guidelines for Credit Stacking. One way to simplify that analysis is to consider a Proportional Approach to tracking stacked Credits. For example, a seller may generate multiple Credits from a BMP, but would then need to sell those Credits proportionally (i.e., as 20% of a project's phosphorous Credits are sold, then 20% of a project's possible carbon Credits are deducted from its ledger). Credit stacking from the same spatial area can complicate accounting and raise issues of additionality. Due to concerns about Additionality, the general presumption is that stacking is disfavored. The burden is on the Credit seller and Buyer to demonstrate that multiple Credit sales from the same area are Additional.

Project Implementation & Quality Assurance Standards

Trading projects should be undertaken according to Quality Standards so that the credited water quality improvements will occur and remain in place as long as Credits remain valid. Projects should be screened for eligibility criteria, comply with other laws, required permits, or approvals, and BMPs must be installed according to the standards and consistent with the assumptions used to quantify Credits. As discussed earlier in this Executive Summary, each BMP should be approved by the relevant state agency or its designee either as part of a permit review or other formal process. Each Project Developer should: A) submit a Project Design, Management Plan, and reporting and maintenance plan outlining BMP performance and restoration goals; and B) demonstrate that the project has adequate legal site protection and stewardship funds in place for the duration of the Project Protection Period.

Regulators may choose to set minimum Project Protection Periods. For structural BMPs (e.g., fencing or riparian restoration), the minimum BMP and Project Protection Period should be twenty (20) years to match the typical facility planning cycle of Point Source Buyers. For practice-based BMPs (e.g., cover crops and tillage), the minimum BMP and Project Protection Period should be five (5) years. Any other irregular term may be applied at the discretion of the regulatory agency. Project protection will generally occur through limited-term leases or other contracts, although easements and property transfers may be used if the benefits of a BMP are expected to be more permanent.

Verification & Certification

Instead of using technology to meet CWA requirements at a single Discharge Point, Point-Nonpoint trading arrangements rely on numerous and disperse Nonpoint Sources to provide the pollution reductions needed by a single Point Source through different types of BMPs. Because trading shifts the location of compliance from end-of-pipe discharges to many disperse Nonpoint Source sites, there are different challenges associated with Verifying Water Quality Benefits. Verification and Certification of Nonpoint Source projects can provide regulators with the same level of confidence as traditional Point Source monitoring.

Verification

Once a project has been implemented, but prior to being eligible to sell Credits, a qualified and approved entity should Verify that a project is consistent with established BMP guidelines and eligibility requirements, that estimated Credit quantities are accurate, and that the Project Developer has an adequate Management Plan and Project Protection Agreement in place. This review process is known as "Verification." Verification and Certification can be performed by agencies, permittees, or third parties ("Verification Entities"). The Verification process may be tailored to achieve an appropriate balance between providing assurance that BMPs are creating real water quality improvements and the cost of inspecting numerous and widely distributed BMPs.

Completed projects should be Verified onsite at appropriate intervals to determine compliance with appropriate standards. Information privacy and availability, conflicts of interest, and resource

constraints are all relevant factors in determining the appropriate entity to perform this function. Various Verification methodologies may be combined in different ways depending on the structure of a Trading Framework or Plan (i.e., inspect every project, inspect a subset of projects, or provide programmatic approval for project types or Project Developers). All project Verifiers should be qualified to inspect lands for particular Credit-generating BMPs in a particular geography (and clear direction from states as to minimum qualifications would be helpful). Even where a state water quality agency does not perform Verification, it may choose to inspect a Credit-generating project or trading program at any time according to the relevant procedures outlined in its guiding regulations or statute.

Certification

A final step in this process is the formal, written "Certification" by an agency, permittee, or third party that the Credits are valid, have been Verified, and that all necessary Credit documentation is in place. Each state may choose the appropriate frequency, scope and nature of Verification and Certification for its water quality Trading Frameworks and Plans.

Registration

NPDES permit monitoring reports and other required information are generally available to the public for inspection, review, and oversight through agency websites or upon request. Trades associated with such permits should also be available to the public for similar purposes. Credit serialization and Registration is a transparent way to provide this information. At a minimum, serialized Credits should be posted to a single Registry for a Trading Area (although one Registry per state or region would be preferred). A serialized Registry allows for disclosure and provides an easily searchable version of a permittee's ledger of Credits. A Registry allows agencies, the public, and permittees to be certain that trades are helping to offset water quality based Effluent Limits and that Credits are not being used or sold for more than one purpose.

The information listed on a Registry should include Credit quantities, Trading Area boundaries, and might also include project location and design, the identity of the parties to the Credit transaction, and Verification and site performance reports. Sensitive, confidential, or proprietary information that is not required for Credit transparency (e.g., landowner names) should be kept confidential.

Compliance Determination & Enforcement Actions

Trading distributes pollution reduction activities from the end-of-pipe to several disparate locations, thus raising questions about how compliance and enforcement determinations will be made. Yet, there would seem to be little difference between compliance determinations for trading and determinations for other treatment processes. Compliance is determined as the permittee demonstrates, via its DMRs and other reporting requirements, that it has secured an adequate Credit balance to offset its established water quality based effluent limits at the appropriate time(s) of the year (a similar structure would exist for entities purchasing Credits to offset other compliance or mitigation requirements). In addition, a permittee must comply with all trading-

related provisions of its permit (including monitoring and compliance schedule milestones, if applicable), and all enforceable aspects of its Trading Plan (within the permit, or attached if not included in the permit). Possible violations could stem from not having an adequate number of Credits, or failing to report adequately, as required in a permit.

Roles & Responsibilities in Program Administration

There are several stages in the Credit issuance process where the public is provided an opportunity to review and approve trading project documentation. Regulators and stakeholders need to consider which entity (agencies, permittees, or third parties) will administer the phases of the Credit issuance process: Site Screening, Verification, Certification, and Registration. In addition, states should identify the entity or entities responsible for maintaining and adaptively improving the program quality and performance standards, Quantification Methods, etc. For each of these phases, agencies, and trading program participants should consider the following when determining roles:

- The skills and expertise required to perform each function;
- The administrative time and costs involved;
- Whether the phase should be required or just recommended;
- Whether it will be necessary to rely on third parties to execute trading functions; and,
  The need to provide access to information, balanced against the need to protect some aspects of participant privacy.

Adaptive Management & Tracking Effectiveness

Adaptive Management

Current water quality challenges require flexible, innovative approaches that can be quickly adjusted and improved. In order to accelerate water quality improvements, it is important to move forward with the best information currently available and to test the assumptions underlying the current actions through the collection and incorporation of new data as it comes to light. This process is broadly referred to as "Adaptive Management." In the case of trading, an Adaptive Management framework would focus on: A) improving implementation and performance quality standards, Protocols, and process; B) generating and incorporating new information on the Quantification Methods used to estimate water quality improvement associated with individual BMPs; and C) evaluating whether water quality improvement actions have been effective at meeting Trading Framework/Plan and overall water quality goals. An Adaptive Management framework would not be used as a mechanism for assessing individual permit compliance.

Each Trading Framework or Plan should include, or reference, an existing Adaptive Management plan describing how the program will track and gather the information needed to improve the performance of program Quantification Methods and administration (e.g., Protocols, operational processes, which entity will perform these actions, etc.) and identify an interval for incorporating updates (e.g., biennial or as needed).

Effectiveness Monitoring

Ultimately, many will want to know whether trading is fulfilling the obligations of Point Sources and whether water quality is improving. Detecting changes in ambient water quality that is causally attributable to trading is often difficult, if not impossible, especially in Watersheds where the adverse water quality impacts of Point Sources are relatively small compared to the impacts of other sources and background conditions in a Watershed. Thus, an Effectiveness Monitoring strategy should lay out a pyramid of metrics that can represent progress toward Water Quality Standards and improving beneficial uses (e.g., meeting BMP metrics first, then securing pollutant load reductions, and then finally restoring beneficial uses). Nonetheless, as part of overall Watershed-scale tracking, trading could be the impetus for establishing an Effectiveness Monitoring program, or could be tied to an overall TMDL effectiveness monitoring effort. Where states are not already undertaking TMDL or Watershed Effectiveness Monitoring, the additional study design, data collection, and analysis necessary to evaluate the impact of trading alone may be infeasible. Until the responsibility for this task is clearly delineated, Effectiveness Monitoring is unlikely to occur.

Next Steps

The aspects of trading described above are intended to spark conversations about how Trading Guidance, Frameworks, and Plans can be built and operated to best achieve water quality and compliance goals, and strike the fine balance between cost effectiveness, usability, and transparency. As this first set of Recommendations is completed, each of the states will work with stakeholders to test, discuss, and better refine these Recommendations to meet the needs of locales throughout the Northwest.

The state agencies, EPA Region 10, Willamette Partnership, and The Freshwater Trust plan to revisit these Recommendations over the coming year and by November 2014, plan to refine them to produce a proposed set of final trading program recommendations.

During that period, the group welcomes thoughts, comments, discussion, and suggestions on any one or all of these Recommendations.

DRAFT

I. Introduction

In 2003, U.S. EPA released its national policy framework for water quality trading, which describes conditions for allowing off-site compliance for NPDES permit Effluent Limits[6]. Since that time, only thirteen states have developed a state-level framework around how trading should occur.[7] Three of those states—Idaho, Washington, and Oregon—are located in the Pacific Northwest region, and so have generated considerable interest in their trading programs.

In November of 2012, Idaho, Oregon, and Washington water quality agencies, and U.S. EPA Region 10 began working together to define what they consider some recommendations to implement water quality trading. The goal of this effort is to help ensure that water quality trading programs have the quality, credibility, and transparency necessary to be consistent with the Clean Water Act ("CWA") and make certain all trades achieve water quality improvements. By identifying recommended approaches to critical components of water quality trading programs, this effort may also serve to increase the confidence of participants and observers that trades produce their intended Water Quality Benefits and comply with applicable CWA regulations.

This draft *Recommendations* document is based on discussions held at a series of interagency workshops convened between March 2013 and early 2014. This document is intended to represent a synopsis of the discussions among the attendees as to how each component of trading should operate. A number of the "draft recommendations" reflect points from the 2003 U.S. EPA Water Quality Trading Policy ("2003 U.S. EPA Trading Policy"),[8] and so where there is overlap, reference has been made to the policy, with supplementary explanation where needed.

Each section includes a draft recommendation, and where appropriate, commentary describing important considerations derived from agency comments and workshop discussions. The "draft recommendations" in this document only represent recommendations. Inclusion of these practices does not result in changes to any existing state program. Participating states may choose to incorporate these draft recommendations into their own trading program rules or guidance in the future.

Beginning in 2014, states will test some of the ideas from the draft framework by implementing pilot projects in selected Watersheds. The framework will then be revised to incorporate lessons

---

[6] Throughout this document, defined terms will be capitalized. Definitions can be found in the Glossary (Section V).

[7] This includes states with legislation, policy, guidance, or draft guidance on water quality trading at the state level as of November 2013 (i.e., Idaho, Colorado, Connecticut, Florida, Maryland, Minnesota, Montana, Ohio, Oregon, Pennsylvania, Virginia, Washington, and Wisconsin). This does not include states with individual authorized trading programs or pilot programs.

[8] U.S. EPA, Water Quality Trading Policy, 68 Fed. Reg. 1608 (Jan. 13, 2003), *available at* http://waterepa.gov/type/Watersheds/trading/tradingpolicy.cfm.

learned through the end of the project in September 2015. The states may choose to update their own trading program's rules or guidance to incorporate the recommendations. If states choose to do so, they would follow their state's applicable procedures for public participation and input.

DRAFT

II. Guiding Principles for Water Quality Trading

Water links us in ways that underpin healthy communities, economies, and ecosystems. When Congress passed the Clean Water Act[9] ("CWA") in 1972, it aimed to protect those links in ways that would restore the nation's waters to levels that would support fishing, swimming, and the other beneficial uses we rely on. As an alternative compliance pathway for meeting NPDES Effluent Limits, water quality trading is just one tool of many to help achieve the goals of the CWA and other public objectives.[10] Trading is not appropriate for many water quality challenges, and its efficacy must be evaluated before assuming it can be useful in every Watershed. When designed well and combined with other tools, however, trading programs can help achieve water quality goals in a way that is beneficial for landowners, communities, and the environment. This is consistent with objectives identified in the 2003 U.S. EPA Trading Policy, which encourages water quality trading programs that "facilitate implementation of [total maximum daily loads ("TMDLs")], reduce the costs of compliance with CWA regulations, establish incentives for voluntary reductions, and promote Watershed-based initiatives."[11]

The 2003 U.S. EPA Trading Policy describes how water quality trading can comply with different requirements of the CWA and its implementing regulations. Recognizing that the CWA and its implementing regulations do not directly address water quality trading, the design of water quality trading programs should focus on how they can best support achievement of particular CWA goals[12], including efficient and timely implementation of TMDLs.[13]

Individual trading programs will inevitably face many unique situations and issues. These guiding principles are meant to provide state agencies and other stakeholders with a cohesive approach to thinking through the tough design issues that should be contemplated when establishing a water quality trading program where recommendations are not clearly defined or there is a need for a case-by-case decision.

Water quality trading is generally supported when it is consistent with the 2003 U.S. EPA Trading Policy and where it meets the following criteria.

---

[9] Federal Water Pollution Control Act, 33 U.S.C. § 1251, et. seq. (2006).

[10] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1609 ("Water quality trading is an approach" to "[f]inding solutions to [] complex water quality problems.").

[11] Id.

[12] *Id*. at 1610 ("*CWA Requirements*. Water quality trading and other market-based programs must be consistent with the CWA.").

[13] *Id*. at 1610 ("*CWA Requirements*. Water quality trading and other market-based programs must be consistent with the CWA.").

1) More effectively accomplishes regulatory and environmental goals

Water quality trading is supported when it allows sources to comply with their allocations and permit Effluent Limits in a way that is linked directly to meeting applicable water quality standards—and protecting the beneficial uses that the TMDL and permits are designed to achieve[14]— and when it addresses causes of pollutant of concern without negatively affecting other parts of the environment. Additionally, water quality trading is supported when it achieves more pollution reduction and greater improvements to water quality than would have occurred without trading over a comparable period of time, and does so with reasonable and predictable costs. [15] Water quality trading should seek to achieve ancillary environmental benefits beyond the required reductions in specific pollutant loads (such as the creation and restoration of wetlands, floodplains and wildlife, fish and/or waterfowl habitat, reduction of multiple pollutants, etc.) and seek to provide for the long-term stewardship and management of practices that produce Water Quality Benefits.[16]

Commented [BC3]: REVIEWERS: This is how we tried to capture the different opinions on the role of balancing costs in trading programs.

2) Is based on sound science

Water quality trading is supported when program goals, Credit Quantification Methods, and Adaptive Management systems are based on sound science and on their ability to achieve water quality goals, instead of economic justifications alone.[17] Because science evolves, Trading Frameworks and Trading Plans should monitor and evaluate outcomes to regularly improve and report on the progress toward water quality goals.

3) Provides sufficient accountability that promised water quality improvements are delivered

Water quality Trading Guidance, Frameworks, and Plans should seek to foster transparent information on program rules and processes, location, and volume of transactions, as well as the effectiveness of trading over time. Trading documents should foster accountability by clearly articulating who is responsible for producing water quality improvements, and by providing a mechanism for identifying and correcting problems, including dispute resolution. Accountability in trading is improved when the public is engaged and participating at the earliest stages and throughout the development of programs. The inclusion of the public input strengthens trading effectiveness and credibility, and provides sufficient information for

[14] Trading cannot cause an impairment of existing or Designated Uses. *Id.* at 1611.

[15] Some states may choose not to consider transaction costs when developing Trading Guidance or Trading Frameworks.

[16] *Id*. at 1609–1610.

[17] *Id*. at 1612 ("*Program Evaluations.* Periodic assessments of environmental and economic effectiveness should be conducted and program revisions made as needed.").

regulatory agencies and the public to regularly determine that trades and individual Credits comply with a permittee's waste load allocation and Effluent Limitations.[18]

4) Does not produce localized water quality problems

The use of water quality trading is not supported where it leads to localized water quality problems, such as thermal barriers to salmonid migration, thermal shock/lethality for salmonids, impairment of known salmonid spawning habitat, algal blooms and areas of low dissolved oxygen caused by nutrient hotspots, or Exceedance of an acute aquatic life criterion within a Mixing Zone, of a chronic aquatic life, or of a human health criterion at the edge of a Mixing Zone (using design flows specified in the water quality standards).[19]

5) Is consistent with the CWA regulatory framework

As described in the 2003 U.S. EPA Trading Policy, water quality trading should be consistent with the relevant provisions of the CWA and its implementing regulations, such that it does not seek to circumvent the installation of minimum treatment technology required by federal and/or state regulations at the site of a Point Source, adversely affect water quality at an intake for drinking water supply,[20] delay implementation of a TMDL approved or established by EPA, or cause the combined Point Source and Nonpoint Source loadings to exceed the cap established by a TMDL.[21]

DRAFT

[18] Id.

[19] Id.

[20] *Id*. at 1611.

[21] *Id*. at 1610.

III. Recommendations

1. Eligibility for Water Quality Trading

In this section:

- What are the preconditions for trading?
- How is trading incorporated into a permit?
- How should the Trading Area be determined?
- Which pollutants should be traded?
- Which BMPs can generate Credits?

Trading is not appropriate for every Watershed or in every situation. The 2003 U.S. EPA Trading Policy identifies some specific conditions under which trading may occur. This section describes the project partners' recommended eligibility criteria for individuals and entities seeking to participate in trading and the generation of Credits. This includes those criteria already identified in the 2003 U.S. EPA Trading Policy.[22] Recommendations below are based on the states' experiences with water quality trading to date, lessons from other areas of the country, and a pragmatic view of how trading should proceed in the Pacific Northwest.

1.1 Eligible regulatory trading environments

Draft Recommendation – Eligible environments*: The 2003 U.S. EPA Trading Policy notes that trading may be used under the CWA to maintain high quality waters, in pre-TMDL impaired waters, pursuant to TMDLs, in pretreatment situations, and intra-plant.[23] Trades in the Northwest will be considered primarily pursuant to individual NPDES permit reissuance in basins covered by an approved TMDL, or similar Watershed analyses. Subject to agency discretion and conformance with the CWA and its implementing regulations, trading may also occur outside of a TMDL and under other types of permits or regulatory tools.*

Commentary: Trading may be permitted under another type of permit or regulatory tool, such as CWA Section 401 Certifications, Watershed trading permits, Variances, or other Watershed-wide plans. Proposals for trading outside of or prior to the development of a TMDL may be evaluated on a case-by-case basis provided that a water quality analysis similar to the TMDL

[22] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

[23] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610-1611.

analysis is undertaken. Such a situation may be challenging for many state agencies, as the associated analysis would require large amounts of staff time and capacity, and may strain already limited staff resources. In order for agencies to consider trading prior to or outside of a TMDL in water quality limited water bodies, the following issues and information should be available for analysis:

1. Identification of pollutants, pollutant forms and sources, and the relative contribution of pollution by each source. This analysis needs to be performed by the agency, permittee, or a qualified third party;
2. Agencies, permittees, or a qualified third party have assessed alternatives available for pollution reduction, including available control technologies, to ensure that reasonable options have been considered prior to spending public resources;
3. Agencies have access to review any analysis completed by a permittee or external third-party;
4. Important areas for water quality have been identified within the Watershed to avoid localized impacts and maximize targeted water quality improvements;
5. The state agency or EPA has considered how an outside-of-TMDL trading environment would interact with that state's 303(d) list;
6. Parties understand that trading provisions are subject to change if a TMDL is promulgated, and so trading participants should understand the long-term implications if and when a TMDL is approved.

In basins where Point Sources have been given a wasteload allocation (in a TMDL or another cumulative Watershed analysis), agencies may wish to allow entities to initiate trading in advance of permit reissuance with agreements that allow for those actions to count toward future permit obligations.

Draft Recommendation - Compliance with anti-degradation policy*: Water quality trades and trading programs must comply with the federal anti-degradation policies and state implementing rules, as stated in the 2003 U.S. EPA Trading Policy.*

Commentary: The 2003 U.S. EPA Trading Policy states: "Trading should be consistent with applicable water quality standards, including a state's and tribe's antidegradation policy established to maintain and protect existing instream water uses and the level of water quality necessary to support them, as well as high quality waters and outstanding national resource waters (40 CFR 131.12). U.S. EPA recommends that state or tribal antidegradation policies include provisions for trading to occur without requiring antidegradation review for high quality waters. U.S. EPA does not believe that trades and trading programs will result in 'lower water

quality' as that term is used in 40 CFR 131.12(a)(2), or that antidegradation review would be required under U.S. EPA's regulations when the trades or trading programs achieve a no net increase of the pollutant traded and do not result in any impairment of [D]esignated [U]ses."[24]

Additional anti-degradation requirements may apply when trading bio-accumulative pollutants.[25] States should also be aware that proposed federal regulations may create further anti-degradation implementation requirements [26]

Draft Recommendation – Compliance with anti-backsliding policy*: As stated in the 2003 U.S. EPA Trading Policy, NPDES permits, TMDLs, and water quality standards cannot be renewed, reissued, modified, or revised as a result of water quality trading to include less stringent Effluent Limits, Wasteload Allocations, or Water Quality Standards than those previously achieved, except where allowed under the CWA. States should provide guidance as to how anti-backsliding applies to trading-related permit limits where a TMDL is either promulgated or withdrawn/revoked, and as a result, Point Sources receive less stringent limits than in previous permits.*

Commentary: The 2003 U.S. EPA Trading Policy states: "EPA believes that the antibacksliding provisions of Section 303(d)(4) of the CWA [33 U.S.C. § 1313] will generally be satisfied where a Point Source increases its discharge through the use of Credits in accordance with alternate or variable water quality based Effluent Limits contained in an NPDES permit, in a manner consistent with provisions for trading under a TMDL, or consistent with the provisions for pre-

[24] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1611.

[25] Trading of bio-accumulant pollutants may face extra scrutiny from EPA in light of its July 23, 2013 letter to Idaho notifying the state that even "de minimis" discharges impacting high quality waters are not exempt from Tier 2 public review. Letter from Daniel Opalski, Director, Office of Water and Watersheds, to Barry Burnell, Water Quality Div. Adm'r, Idaho Dep't of Envtl. Quality (Jul. 23, 2013), *available at* http://www.epa.gov/region10/pdf/water/wqs/id_de_minimis_disapproval_072313.pdf.

[26] *See* Water Quality Standards Regulatory Clarifications, 78. Fed. Reg. 54,518, 54,525 – 54,531 (Sept. 4, 2013). These changes would ensure that states and tribes only make a finding that lowering water quality is necessary, as required in 40 C.F.R. § 131.12(a)(2), after conducting an alternatives analysis that evaluates a range of non-degrading and minimally degrading practicable alternatives that have the potential to prevent or minimize the degradation associated with the proposed activity. This proposal also provides that if a state or tribe identifies any practicable alternatives, the state or tribe must choose one of those alternatives to implement when authorizing a lowering of high water quality. Assuming these regulations are adopted, states would need to consider how trading would fit within a practicable alternatives analysis.

TMDL trading included in a Watershed plan.[27] These antibacksliding provisions will also generally be satisfied where a Point Source generates pollution reduction Credits by reducing its discharge below a water quality based Effluent Limit ("WQBEL") that implements a TMDL or is otherwise established to meet water quality standards and it later decides to discontinue generating Credits, provided that the total pollutant load to the receiving water is not increased, or is otherwise consistent with state or tribal antidegradation policy."[28] Entities engaged in trading must also abide by the anti-backsliding provision in section 402(o) of the CWA (33 U.S.C. § 1342(o)), where applicable.

If a TMDL does not yet exist for a Watershed, but one is established later, resulting in less stringent limits for permittees engaged in trading, anti-backsliding could become an issue. Anti-backsliding could also be an issue for a permittee engaged in trading if a TMDL is withdrawn, disapproved, or revoked, resulting in less stringent limits for permittees. States should contemplate these situations in terms of providing anti-backsliding guidance for these permittees.

1.2 Regulatory instruments that drive trading

The CWA has several different regulatory programs designed to protect water quality. Key programs which affect water quality trading are the water quality standards and the National Pollutant Discharge Elimination System (NPDES) permit programs. The establishment and attainment of water quality standards is a key stone of the CWA and the NPDES permit program is designed to limit pollutant discharges in order to achieve the water quality standards. Trading often occurs via NPDES permits. If a permittee wishes to purchase Credits to meet its CWA compliance obligation, the relevant permit Effluent Limits will determine how many Credits it must buy. Water quality standards can be in the form of either narrative or numeric criteria, and must be protective of the beneficial uses. The NPDES permit is designed to allow permittees to achieve criteria.

1.2.1 Water Quality Standards

Each state has the responsibility under the CWA to establish numeric or narrative standards to protect its beneficial uses and submit them to EPA for approval. EPA has the authority under the CWA to review these proposed state standards and determine that the proposed standards

[27] It is possible that neither TMDLs nor Watershed plans will outline the specific details of a trading program, and so Effluent Limits should be consistent with the relevant Watershed trading program or framework.

[28] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1611.

would protect the beneficial uses in that state. Trading is a compliance option that could assist a permittee in achieving their NPDES permit Effluent Limits which are designed to attain water quality standards established in that state.

***Draft Recommendation**: NPDES permits should establish the regulatory requirements for the discharger to meet its CWA obligation for achieving water quality standards. If trading is to be used as a tool for achieving NPDES requirements, the permit should clearly describe how this will be achieved.*

Commentary: The NPDES permit will require the permittee to meet the water quality standards established for that specific receiving stream. The Effluent Limits established in the permit are designed to achieve the water quality standards the permittee has a potential to exceed. In some situations the regulatory agency may establish a temporary Variance to a standard and place in a permit the Effluent Limits needed to achieve these site specific standards.

1.2.2 NPDES Permits

The NPDES permit (CWA section 402) is the primary regulatory tool for controlling wastewater discharges of pollutants to waters of the United States and the respective states (i.e., jurisdictional waters), and WQBELs in NPDES permits often create demand for water quality trading Credits. The federal and delegated state regulations implementing CWA section 402 describe in detail what must be in a NPDES permit and both federal and state guidance exist to describe, step-by-step, what a permit writer needs to consider in developing a permit. Nonetheless, each state has the latitude to structure its permits differently, so long as each permit contains the requirements in 40 C.F.R. pt. 122.

A NPDES permit provides the permittee with permission to discharge pollutants into jurisdictional waters, contingent upon the permittee's treatment of its discharge to established pollutant loads and effluent concentration limits. A permittee may rely on trading to achieve these outcomes. In addition, a NPDES permit contains monitoring and reporting requirements tailored to explicitly demonstrate compliance with water quality-based and technology-based Effluent Limits. If the permittee cannot meet new WQBELs via trading at the time the permit is issued, the permit may contain a Compliance Schedule identifying when the permittee must be in compliance with the permit. Depending on the length of time needed to come into compliance, the Compliance Schedule may identify interim milestones that a permittee must achieve. In addition, the Compliance Schedule may include interim WQBELs.

In addition to establishing Effluent Limits, a NPDES permit may require a permittee to develop and implement other supporting programs required under federal or delegated state agency rules, including pretreatment, water reuse, or biosolids programs. The development and implementation of a trading program in a permit is similar in nature to these programs as it describes specific processes and actions the permittee must undertake and maintain to come

into compliance with the WQBELs established in the permit. EPA may be asked for comments on Trading Guidance, Frameworks, and/or Plans, but does not have the formal authority to approve or disapprove these documents. EPA's review authority for delegated states is limited to approving or disapproving individual permits and the conditions for trading described within the permit or referred to from within the permit.[29]

The details of a trading program could be developed by a state agency, a group of stakeholders, and/or the permittee. This document uses the terms "guidance" to describe state- or federal-level policy or rules; "Trading Framework" to describe the Watershed-level documents that house the details of trading processes and standards, and "Trading Plan" or "Trading Solution" to describe permittee-level trading details. NPDES permits need to include sufficient detail on trading or incorporate that detail by reference to an external trading program document, which when implemented, would allow the permittee to achieve compliance with its established Effluent Limits. As part of developing an NPDES permit, permit writers can use Permit Evaluation Reports to document some of the analysis, calculations, and rationales the permit writer used to build the permit and the associated requirements for trading. Although EPA and delegated states may have slightly different outlines for their individual NPDES permits, all permits should contain the information required in 40 C.F.R. pt. 122.

This section contains recommendations as to where specific language and detail related to water quality trading might be most strategically included in a NPDES permit, but ultimately the permit writer has the discretion to determine what level of detail is necessary for different permittees, what components of the trade program could be included in a NPDES permit, and where those components will appear within the permit.

a. Waste Discharge Limits Not to be Exceeded

The NPDES permit contains Effluent Limits (either technology- or water quality-based) that the permittee must achieve in order to discharge into the receiving water. Trading cannot be used to meet technology-based Effluent Limits ("TBELs") unless authorized by federal regulation.[30] Depending on the assimilative capacity of the receiving water, WQBELs are developed to achieve water quality standards at the discharge pipe or outside the Mixing Zone. For waterbodies covered by a TMDL, a permittee's Effluent Limits must be consistent with the

[29] *See* 33 U.S.C. § 1342(d).

[30] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610-1611.

assumptions and requirements underlying TMDL wasteload allocations ("WLA") for specific parameters.[31]

> *a(1). Identification of trading parameters, units, and quantity needed to offset Effluent Limits.*

Draft Recommendation – Identification of trading parameters, units, and quantity needed to offset Effluent Limits in the NDPES permit*: The Effluent Limits section of the NPDES permit should identify the parameter of concern, its units, and the number of units that would be needed to offset the specific loads of the pollutant (including documentation of the calculation methodology and water quality standard that should be used in calculations). If a permittee needs a different amount of units at different points in a year (because of seasonal changes in river flow, discharge characteristics, or water quality standards), this section of the permit should note the number of units needed for each discrete time period. Likewise, if a permittee is not projected to need Credits immediately, this section of the permit should indicate when the permittee will need to obtain Credits to offset its future Exceedance of its Effluent Limits. This section of the permit should not include a detailed description of Credit-generating projects, their type, or location.*

Commentary: The Effluent Limits section of the NPDES permit and its corresponding write up in the Permit Evaluation Report focuses on determining whether a specific discharge will exceed water quality standards and developing Effluent Limits so that the discharge meets water quality standards. If a trading program is going to be used by the permittee to offset Exceedances of Effluent Limits, the Permit Evaluation Report should clearly describe the formulae the permit writer used to calculate the Effluent Limits and the trade units to offset the pollutant load. Different states may choose to put more or less detail on trading into the Effluent Limits section of a permit. For trading, it makes sense to include a clear description of the parameter that could be traded, in standardized units that are consistent with those in the TMDL or other Watershed-wide plan, and the number of units that a permittee would need to obtain (at all points during a year) if it pursues trading. Important to this process is the consistent articulation of use of a standard methodology for computing a permittee's Exceedance.

A Trading Plan developed and implemented by a permittee should describe how the trade units will be generated including among other things how projects would be evaluated, Verified and Certified. This process is essential to show that the trade units used to offset an Effluent Limit

[31] 40 C.F.R. § 122.44(d)(1)(vii)(B).

Exceedance have been appropriately generated. This information and any monitoring associated with this process should be submitted to the regulatory agency and available for public review. The permit should describe what detail is needed by the regulatory agency and how it would be available for public review. In the Effluent Limit section, however, it should be clear as to how many trade units are needed to offset the Effluent Limit Exceedance.

Important in the calculation of the number of units needed to offset the specific loads of the pollutant is the relevant water quality standard. Usually, the generally applicable standard is articulated in federal and/or state rules. A permittee relying on a Trading Solution may also receive a Variance, which is essentially a temporary change in the relevant water quality standard for the pollutant at issue.[32] If a permittee receives a Variance, the Effluent Limits section of the permit should clearly articulate the impact of this different water quality standard in calculating the amount of units needed to offset the specific loads of the pollutant via trading. This section of the permit should probably also note the duration of the approved trading-related Variance, and note that the permittee will follow the approved pollution reduction plan associated with the Variance (with trading likely outlined as an alternative for complying with the Variance). Special trading-related conditions within the permit should also note that the permittee must comply with the pollutant reduction plan, or whatever mechanism is utilized to safeguard application of the Variance. The monitoring section of the permit may also include additional monitoring actions related to trading and Variance progress, and may require an annual progress report.

a(2). Describing the Trading Plan/Solution in other sections of the permit, and not the Effluent Limits section of the permit

***Draft Recommendation – Describing the trading program in the NPDES permit**: Outside of identifying the parameter of concern, its units, and the number of units that would be needed (and when) in the Effluent Limits section of the permit, the delegated states and EPA will need to determine where and how much more to include of the trading program and Trading Plan in the NPDES permit. It may be appropriate to include the details of the permittee's Trading Plan in other special conditions or attachments to the permit (see Draft Recommendation 1.2.1(d)).*

Commentary: The elements of a permittee's Trading Plan directly related to offsetting the Effluent Limit Exceedances should be included in the Effluent Limits section of the permit. The

[32] Variances are authorized by federal regulations but are implemented through EPA-approved state regulations and guidance: "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as Mixing Zones, low flows and Variances. Such policies are subject to EPA review and approval." 40 C.F.R. § 131.13.

individual permit writers will need to determine what additional Trading Plan details would be appropriate in an NPDES permit and where these details are most appropriately placed in the body of the permit or attached to the permit.

a(3). Relationship of the permit compliance point to the trade compliance

The NPDES permit establishes a specific compliance point for the Effluent Limits identified in the permit. Generally, the permittee must be in compliance with the Effluent Limits at the end of its discharge pipe. In a trading program, Credits will likely be generated within the broad geographic Trading Area of the TMDL, but the permittee will use those Credits to offset Effluent Limit Exceedances that have a specific compliance point defined in the permit.

***Draft Recommendation – Compliance Point**: Trades may take place in areas of the Watershed defined in the TMDL or appropriate trading documents, and applied as offsets to the Effluent Limit Exceedances for the permittee to be in compliance with its permit.*

Commentary: In Watersheds with a TMDL, the TMDL should identify areas where water quality is most impacted by discharges. The TMDL should further describe the area of a Watershed where point and Nonpoint Sources need to reduce pollutant loads so that the water quality standard is achieved. In contrast, the permit limits apply at the end of the outfall. If a permittee wants to offset its Exceedance through use of a Trading Solution, the point of compliance established in the permit remains the same for the trade Credits provided because the trades offset the Effluent Limit in the permit.

b. Monitoring

A NPDES permit identifies the physical effluent monitoring that a permittee must conduct. The purpose of this section of a permit is to determine compliance with a permit's Effluent Limits. The monitoring section details the specific parameters to be monitored, monitoring frequency (i.e., daily, monthly, or annually), the type of sample required (i.e., grab, composite, or continuous), the actual physical form of the report (Discharge Monitoring Report, or DMR, or something else), and the timing for reporting to the regulatory agency. If the permittee is also implementing other required programs such as pretreatment, biosolids, etc., this section will describe the specific monitoring required by these programs (including identification of the parameter, the frequency of monitoring, and the type of sampling needed).

A water quality trading program may include a number of different monitoring elements, and so it is important to identify which aspects of monitoring must be described in this section of the permit. At a minimum, a permittee should be required to report Credit quantities (as defined in the section of the permit that details Effluent Limits, units, and Exceedances).

Draft Recommendation – Discharge Monitoring Reports*: In the comment section of the DMR, a permittee should report the quantities of Credits that it holds and attest that it has secured those Credits and that those Credits are available during the period(s) for which they are needed. The permit would establish the timing for reporting the amount of Credits bought and held (monthly, seasonally, or annually).*

The special conditions of the permit and/or the Trading Plan attachment should identify the monitoring and reporting requirements a permittee should utilize to demonstrate that the Credit-generating BMPs it relies on for compliance are in fact performing as anticipated. This information would be provided to the regulatory agency on a frequency and in the specific manner required by the permit writer.

Commentary: A viable trading program may require several forms of monitoring to successfully track permittee compliance and project performance. The permit writer needs to determine what monitoring is needed to show compliance with permit limits and conditions. The DMR focuses on obtaining that information related to the physical, chemical, and biological quality of the discharge. This data is compared to the Effluent Limits to determine compliance. In a trading context, other monitoring and reporting safeguards may also exist (i.e., public registration of Credits—Draft Recommendation 8; ongoing Verification of Site Performance—Draft Recommendation 7.4; annual report on BMP performance—Draft Recommendation 1.2.1(d)(3)). In the DMR, therefore, the permittee should document the quantity of Credits generated for permit compliance, and attest that its Credits exist and are performing as promised. Without this formal attestation in a compliance document (for which misrepresentation may have enforcement consequences), the permittee cannot fulfill its reporting responsibility.

c. Compliance Schedules

If a permittee reliant on trading cannot immediately achieve compliance with its WQBELs via trading, its NPDES permit may contain a Compliance Schedule detailing how the permittee will achieve compliance with its Effluent Limits "as soon as possible."[33] This schedule will outline the

33 40 C.F.R. § 122.47(a)(1). Compliance Schedules are supported by EPA to address water quality standards that were developed after July 1, 1977 so long as the state issuing the permit has clearly indicated in its water quality standards or implementing regulations that it intends to allow for them. Compliance Schedules are also only considered valid to aid in the achievement of WQBELs. Memorandum from James A. Hanlon, Director, Office of Wastewater Management, to Alexis Strauss, Director, Water Division, EPA Region 9, Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits (May 10, 2007), available at http://water.epa.gov/lawsregs/guidance/wetlands/upload/signed-hanlon-memo.pdf [hereafter "Hanlon Memo"].

enforceable milestones, timing, and deadline for coming into compliance.[34] Compliance Schedules recognize that even though the permittee is not yet achieving the final Effluent Limit established in the permit via trading, as long as the permittee abides by the schedule to design, build, and operate its Trading Solution, it is considered in compliance with its permit. Compliance Schedules may not be appropriate for every permit involving trading.

***Draft Recommendation – Compliance Schedules**: To the extent that a permittee reliant on a Trading Solution is not able to meet a new WQBEL immediately, its permit should contain a Compliance Schedule outlining the trading-related enforceable milestones, timing and deadline for coming into compliance with its WQBEL(s) "as soon as possible." When deciding upon milestones, timing and deadline of trading-related provisions in a Compliance Schedule, permit writers should examine all relevant data and thoroughly describe the basis for their decisions in the Permit Evaluation Report.*

If the time needed to come into compliance with a new WQBEL extends beyond the 5-year cycle of an NPDES permit, the permit should contain the entire Compliance Schedule necessary for the facility to achieve the new WQBEL, even though the schedule will extend beyond the current permit's expiration date.

Commentary: If they are needed, regulatory agencies try to keep Compliance Schedules—including those related to permits with trading—as short as possible and try to achieve compliance "as soon as possible,"[35] as required by the federal regulations and guidance. Much has been written on trying to determine what is "as soon as possible." Compliance Schedules should fit the particulars of an individual permit. Although there are guidelines for how long Compliance Schedules should be at the extreme, it is difficult to standardize interim limits, specific schedule lengths, etc. EPA refers to its internal "Hanlon Memo"[36] for direction and states often have specific guidance attempting to define this term.[37]

---

34 When the time needed to design, build and operate a Trading Solution is lengthy, the permit writer may establish interim effluent requirements (which may be in the form of interim Effluent Limits) that the permittee must achieve while building its Trading Solution to the necessary capacity. 40 C.F.R. § 122.47(a)(3).

35 40 C.F.R. § 122.47(a).

36 *See supra* note 24.

37 For example, Oregon has an IMD and regulation. OAR § 340-041-0061(14); Oregon DEQ, Compliance Schedules in NPDES Permits IMD § 3.2 (2007, updated 2010) (emphasis added), *available at* http://www.deq.state.or.us/wq/pubs/imds/ComplianceSchedule.pdf

The permit writer should perform a reasonable evaluation of the individual permittee's situation, and how its Trading Solution will help it comply with its Effluent Limits. In particular, when linking Compliance Schedules with a Trading Plan, permit writers should evaluate data from the facility and the Watershed to determine how quickly the permittee could establish its Trading Solution and how soon Credit-generating BMP projects could be completed. In addition to considering the time needed to find BMP project sites and assess their Credit-generating potential, the permit writer should contemplate the time it will take to establish site-specific contracts with landowners (to install Credit-generating BMP projects), the time necessary to design and install BMP projects, and any potential time lags between installation of a BMP and that BMP's full maturity. Consideration should also be given to localized resource supply constraints in implementing the Trading Solution (e.g., supply of materials, equipment, and labor). If any or all of these factors exist, it may take time for a permittee's Trading Solution to yield compliance with Effluent Limitations, and so the Compliance Schedule should provide the permittee the appropriate amount of flexibility. The permit writer needs as much information as possible to make a professional judgment as to an appropriate time period to complete all this work and offset the Effluent Limitation via a Trading Solution. This evaluation should be documented in the Permit Evaluation Report, and should be available for public review at the time the permit is placed on public notice.

If a permittee's Trading Solution will not result in achievement of WQBELs by the end of a five-year NPDES permit cycle—which may occur if trading-related BMPs take time to fully mature, permit writers should consider including the full Compliance Schedule period in the first NPDES permit. This approach establishes the long-term compliance commitments in the first permit cycle and would require the permittee to meet the schedule even if the permit is administratively extended after the end of the first 5-year cycle. To the extent TMDLs and their implementation plans describe overarching timelines and milestones needed to reach water quality standards over a defined period of time, and note how trading will help to achieve those goals, permit writers can use that information when developing individual Compliance Schedules for permittees

d. Special Conditions for Trading

With special conditions—which may be included in more than one part of a NPDES permit—the permit writer may detail how a permittee should develop and implement its Trading Solution so to comply with the relevant state and federal water quality regulations. All such trading conditions should support the achievement of water quality standards and the protection of beneficial uses. A permit reliant on trading will likely need special conditions in order to be deemed in compliance with its Effluent Limitations.

d(1). Incorporation of general water quality trading components in the permit

***Draft Recommendation – Incorporating trading components in permit special conditions**:*
Permits that include trading can contain special condition(s) describing or referencing the details of the Trading Solution. These permit conditions can either incorporate by reference a trading program developed for the Watershed and approved by the state, include a general outline of all of the necessary components of a permittee's Trading Solution (with reference to an attached Trading Plan for details), or fully describe all trading conditions. Regardless of whether the permit incorporates the details of a Trading Solution by reference to outside trading programs or separate permit attachments, or includes all of the details within the permit itself, a permit should in some way address the following elements:

- *Trading Area (justification and how it is protective of beneficial uses);*
- *Baseline (sources of applicable regulation or law, how Baseline is expressed in the permit—i.e., as a set of minimum BMPs, as a % load reduction target, an overall program requirement);*
- *Description of Credit Quantification Methodology (how pre- and anticipated post-project conditions are modeled, how Credit values are derived, how Baseline is accounted for);*
- *Trading Ratio (articulation of assumptions and components);*
- *Risk mitigation mechanisms (Reserve Pool, insurance, performance bonding, etc.);*
- *Project pre-screening (whether it is required or suggested);*
- *Allowable BMPs (actions, identification of quality and performance standards);*
- *Credit life (when Credits become valid, how long Credits remain valid, renewability of Credits);*
- *Project site design, maintenance, implementation, and performance confirmation (whether these components are required, and their frequency);*
- *Verification of project site implementation and performance (whether required, which entity will perform, and the standards by which performance is judged);*
- *Credit registration (whether required, characteristics of Credit Registry, information disclosure minimums).*

Where available, a description of specific Credit-generating projects, their type and/or location may be included in the permit or Trading Plan.

Permit Evaluation Reports can be used to provide the rationales and additional detail in support of the decisions made on trading within a particular permit.

Commentary: Ideally, a Watershed will already have an established and approved trading program. If a permittee's Watershed is not covered by such a program, the permittee will likely

need to pursue one of two options: 1) fully describe the Trading Plan and details in the permit; or 2) generally reference Trading Plan elements in the permit, and include details in a separate attachment.[38] In any case, the permit should—by reference or explicitly—address the core components of trading. However, because each permittee may find itself in a different situation, special trading conditions need to be included and written into the permit on a case-by-case basis. If specific Credit-generating projects, project type and/or project locations are included in the permit or Trading Plan, a permit modification would be required if any of these details change.

d(2). Building a Trading Placeholder into a Permit.

Draft Recommendation – Timeline to develop Trading Plan*: Permittees may wish to have the option to pursue trading in the future in their permits. If the permittee has not yet developed its detailed trading program by the date of permit issuance, but it wants to preserve the option for trading in its permit, it should, by some date certain identified in the permit, fully develop its Trading Plan, and the public should be provided adequate opportunity to review and comment on the Trading Plan. In this case, the permit should clearly note that no trades may be used as offsets by the permittee until the detailed Trading Plan has been noticed and commented upon by the public, and approved by the agency.*

Commentary: For many permittees, the specifics of its Trading Plan may not be complete when a permit is issued or renewed. In fact, permits may include trading as one treatment option, but lack the details related to that Trading Solution at the time of permit issuance. Even if all program details are not included in the permit, states may consider allowing trading as a treatment option provided that the permittee is obligated to develop a detailed trading program by a particular date in time. Other similar programs (i.e., biosolids, reuse water) are likewise not fully detailed in the permit. Based on these conditions, permit writers will need to consider how much detail on trading is needed in special conditions at the time of issuance; this determination will likely hinge on the amount of time a permittee has spent considering a trading alternative prior to the issuance of its permit. Overall, these special conditions should at least provide an outline of the type of detail needed for that permittee to develop and implement a Trading Solution that will meet its Effluent Limit(s).

A permittee needs to have a detailed trading program in place and approved by the agency before any trades can be used to offset a discharge in Exceedance of its permit limit. That plan

[38] In a recent independent assessment of trading-related NPDES permits, the Electric Power Research Institute (EPRI) reached the same conclusion on this point. EPRI, Case Studies of Water Quality Trading Being Used for Compliance with National Pollutant Discharge Elimination System Permit Limits, at 5-2 (2013).

should be made available to the public (see Section 8 on Registration). Although it is generally understood that changes to required programs are modifications requiring public review, the permit should explicitly note that upon completion of the detailed trading program, the public will be afforded an opportunity to comment on the trading program.

d(3). Reporting obligations beyond DMR submission

Draft Recommendation – Reporting beyond DMR submission*: In addition to the submission of DMRs to the water quality agency, special conditions in a permit may also require a permittee to compile an annual, or more frequent, trading summary report. This report would detail the overall performance of the permittee's Trading Solution and provide other information required by the permit. The permit or the attached Trading Plan should specify where the public can access this information (e.g., permittee's office or agency website, or on-file in a particular location).*

If the permittee is required to Verify the implementation and/or performance of each of its Credit-generating BMP projects, special conditions in the permit or the attached Trading Plan document should specifically note the reporting frequency and where the individual project site reports can be found (e.g., at permittee facility, or on a publicly available website).

Commentary: To document how trading is being used to offset WQBEL Exceedances, the water quality permitting agency should require a permittee to report Credit quantities obtained on the monthly DMRs. Some states may have additional reporting requirements for trading–related permits. For example, a permittee may be required to report on individual Credit-generating BMP performance to show that each BMP is consistent with the requirements of the program (i.e., meeting particular quality or performance standards identified for that action) and generating the Water Quality Benefits necessary to offset the permittee's Effluent Limitation. Program and project site reports may be appropriately included in an annual (or more frequent) report covering all Credit-generating activity. These reports can be important because they provide confidence that the Credits reported on the DMR are performing as expected. This kind of project performance reporting is typically part of ongoing Credit Verification (described in Section 7.4), which determines whether Credits remain valid and available for use. The permittee will typically not report this type of information in a DMR, but regulatory agencies may require this type of reporting via other special conditions within the permit.

The permit writer may request that a permittee develop and retain a report that examines this more detailed project level data. If the report is requested, the permit and/or the attached trading program plan should detail where the public can find the necessary documents. If agencies require permittees to submit these reports, they should ensure that they have the resources to review those reports. Agencies should be clear about what constitutes approval of these reports (e.g., no response may be construed as tacit approval).

Monitoring that is conducted to determine overall program effectiveness, although important to the long-term refinement of models and the trading program, is not necessarily data the regulatory agency needs in a DMR (unless it demonstrates noncompliance by particular sources), or a project- or program-level summary report on the permittee's Trading Solution. However, this broader trading program data still needs to be generated, reviewed, and acted upon if it shows that overall, Credit-generating projects are not meeting trading program requirements. As such, even if it is not included in the monitoring section of the permit, this general program data should still be collected, documented, and used to improve the program (See Section 11.3 for further discussion of programmatic Effectiveness Monitoring).

e. Additional Conditions Imposed by 401 Certifications

States and tribes may include limitations or conditions in their CWA section 401 Certifications as necessary to ensure compliance with water quality standards and other provisions of the CWA and appropriate requirements of state or tribal law.[39] Conditions to protect water quality need not focus solely on the potential discharge; rather, as part of the state or tribal CWA section 401 Certification, the certifying agency may develop "additional conditions and limitations on the activity as a whole."[40]

***Draft Recommendation**: CWA section 401 may impose additional and conditions on a permittee, including those related to trading. Trading-related conditions placed in section 401 water quality certifications for Point Sources must become conditions of the NPDES permit.*

Commentary: Some Nonpoint Source activities may result in a discharge to a navigable water that requires a 401 Certification (i.e., hydroelectric dam operation). In this instance, trading may be a condition of the certification, but would not become part of a NPDES permit.

f. General or Standard Conditions

Code of Federal Regulations (C.F.R.) 40 parts 122.41 and 122.42 contain a description of the general permit conditions applicable to all NPDES permits, including those that include trading. In general, these conditions will not shape or be shaped by trading.

g. Liability for project performance

[39] 33 U.S.C. § 1341(a)(1).

[40] Jefferson County PUD v. Washington Dep't of Ecology, 511 U.S. 700, 712 (1994).

Draft Recommendation- – Liability for project performance: *The ultimate responsibility for the proper functioning of project sites rests with the permittee, even if the permittee hires an independent Project Developer to recruit, install and/or maintain its project sites.*

Commentary: The permittee is ultimately responsible for meeting its permit limits. Therefore, if a permittee has a shortage of Credits because of project failure (and Credits are temporarily or permanently disqualified by the program administrator), a regulatory agency may choose to commence an enforcement action for non-compliance against the permittee. If a permittee contracts with a third party to help deliver Credits, the permittee is responsible for selecting credible contractors. If an independent contractor for the permittee fails to perform, the permittee's recourse against that party rests in contract law. If third party contractor failure results in a permit violation, regulatory enforcement agencies may choose to consider this factor, but third party failure is not a defense to a permit violation. In recognition of this ultimate liability, permittees should consider other methods to reduce this risk, including, the purchase of more Credits than necessary to meet the Effluent Limit.

"Project Developer" defined

Throughout this document, "Project Developer" refers to any entity that develops Credits, whether that entity is the permittee, a contractor of the permittee that develops or aggregates Credits, or a landowner developing Credits on a permittee's behalf.

1.3 Eligible Credit Buyers

Draft Recommendation – Eligible Credit Buyers*: Provided that it is in compliance with applicable federal and state TBELs, Mixing Zone and near-field requirements, and all permit and 401 conditions, a Point Source may obtain Credits to offset WQBEL Exceedances from a Nonpoint or Point Source seller of Credits. As noted in the 2003 U.S. EPA Trading Policy, trading may not be used by Point Sources to achieve new or revised technology-based effluent guidelines or regulations unless explicitly authorized by federal regulations with support by the state. Where accepted by the relevant regulatory agency, public and private entities may also purchase quantified water quality outcomes (i.e., Credits or equivalent) to meet other mitigation obligations (e.g., Endangered Species Act ("ES"A) Biological Assessment of Biological Opinion mitigation, Safe Drinking Water Act ("SDWA") compliance, Nonpoint CWA 401 Certifications, judicial or administrative consent decrees or orders), or to retire for net environmental gain.*

Commentary: There are three types of water quality trades: Point-Point trades, Point-Nonpoint trades, and Nonpoint-Nonpoint trades. The focus of this document is primarily on Point-Nonpoint trades. Each permittee or Buyer must meet certain, non-negotiable conditions pursuant to state and federal law and guidance before they may be eligible to purchase Credits.

U.S. EPA's 2003 Trading Policy recommends, but does not require, that "states and tribes consider the role of compliance history in determining source eligibility to participate in

trading."[41] In general, Point Sources should be in compliance with their current permit and/or any agency-approved schedule for compliance for the pollutant desired for trading. Trading may not be an option for a facility with a history of repeated, significant violations (e.g., criminal violations/convictions). Trading can be used to help a facility, with an otherwise good track record for compliance, come into compliance with a specific permit limit targeted by a trade (e.g., nutrient or temperature Exceedances). In those cases, trading may need to be authorized under a particular enforcement agreement.

As noted in the 2003 U.S. EPA Trading Policy, prior to trading, a Point Source Buyer must also demonstrate that it is not creating near-field or localized impacts, except as allowed in Regulatory Mixing Zones: "EPA does not support any trading activity that would exceed an acute aquatic life criteria within a Mixing Zone or a chronic aquatic life or human health criteria at the edge of a Mixing Zone using design flows specified in the water quality standards."[42] In this assessment, agencies should consider whether trading in this instance will comply with the Endangered Species Act and other species and habitat protection laws. Agencies should also consider whether or not trading will degrade groundwater in violation of any applicable state water quality regulations.

As stated in the 2003 U.S. EPA Trading Policy, U.S. EPA does not support a Point Source trading to meet its TBELs unless doing so is explicitly authorized in 40 C.F.R. § 420.03.[43] Some states may not support the use of trading to meet TBELs in any situation.

Finally, in addition to Credits used for permit compliance, entities are not precluded from purchasing quantified water quality improvements to satisfy other mitigation requirements, where approved by the relevant regulatory agency. This may include supplemental environmental project ("SEP")[44] obligations stemming from civil penalty actions, and other

---

[41] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

[42] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610.

[43] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610 – 1611.

[44] A supplemental environmental project (SEP) is an environmentally beneficial project which a violator voluntarily agrees to perform as part of a settlement of a civil penalty to offset some portion of the monetary penalty. In return, EPA agrees to reduce the monetary penalty that would otherwise apply as a result of the violation(s). SEPs are guided by several factors: First, the project must have a direct relationship, or "nexus," to the violation. Second, up to 80% of the value of the SEP can be applied towards the penalty amount unless the project is of "outstanding" quality, meaning that SEPs are often not pursued because a violator has to pay the remaining 20%. Third, the EPA cannot collect or manage any of SEP funds. Last, there are federal restrictions on how the funds may

CWA, ESA, SDWA or criminal/civil mitigation requirements—or to retire for net environmental gain. Any such purchases would need to comply with appropriate statutes, rules and guidance on the use of such funds, and would need to satisfy Additionality concerns and other requirements associated with generating Credits.

1.4 Trading Area

Trading Areas define the geographical boundaries within which Buyers and sellers can trade.

***Draft Recommendation – Eligible Trading Areas**: "All water quality trading should occur within a Watershed or a defined area for which a TMDL has been approved."[45] Within this hydrologically connected area, trades, by default, should occur upstream of a point of compliance, ideally in conformance with a point of concern defined in the TMDL (or another cumulative assessment of the Watershed). Additionally, trades should occur within waters listed for the same beneficial use(s) as the waters into which the Point Source is discharging (e.g., if the pollutant is temperature for rearing salmonids, the trade should benefit rearing salmonids in the same Watershed).*

Commentary: "Establishing defined Trading Areas that coincide with a Watershed *or* TMDL boundary results in trades that affect the same water body or stream segment and helps ensure that water quality standards are maintained or achieved throughout the Trading Area and contiguous waters."[46] Economically, larger Trading Areas likely facilitate an increase in the number of potential Buyers and sellers who may engage in trading. Ecologically, however, Nonpoint Source Credit production should be sourced from areas that can best address the needed water quality improvements in the basin. Point Sources may choose to purchase Credits within a smaller area than what is defined by a Trading Area for a variety of non-compliance related reasons (e.g., a city may prefer to buy Credits within its boundaries for civic reasons, or Credits may be purchased from particular areas in high need of ecological improvement and investment).

1.5 Eligible pollutants and Units of trade

***Draft Recommendation – Eligible pollutants and units for trading**: Pollutants that have currently been included in trading programs include nutrients, oxygen-demanding parameters,*

---

be designated. Memorandum from Steven Herman, Assistant Administrator, U.S. EPA, to Regional Administrators, Issuance of Final Supplemental Environmental Projects Policy (1998).

[45] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610.

[46] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610 (emphasis added).

sediment, and temperature. Eligible pollutants may be considered by EPA and the states for trading on a case-by-case basis. For each of these pollutants, the default units, pollutant form, and seasonality should be defined in a NPDES permit.

Commentary: Not all pollutants are identified as eligible for trading pursuant to 2003 U.S. EPA Trading Policy.[47] However, "EPA recognizes that trading of pollutants other than nutrients and sediments has the potential to improve water quality and achieve ancillary environmental benefits if trades and trading programs are properly designed."[48] The 2003 U.S. EPA Trading Policy did not mention temperature, but this list is not exhaustive. Oregon and EPA have approved trades involving temperature, and Idaho is considering temperature trades as well. Most trading programs to date around the country have focused on phosphorous and nutrients, with temperature trades taking place in Oregon.

"Clearly defined units of trade are [also] necessary for trading to occur. Pollutant specific Credits are examples of tradable units for water quality trading. These may be expressed in rates or mass per unit time as appropriate to be consistent with the time periods that are used to determine compliance with NPDES permit limitations or other regulatory requirements."[49] Each trading program and/or permit needs to define its own standardized units of trade, ideally using the same units for BMPs and permittee Effluent Limits. It is difficult to set these standard units (e.g., a phosphorous Credit is a pound of total phosphorous reduced per year—lbs TP/yr) across all states and Watersheds because of differences in local Watershed conditions and state water quality standards. Doing so will facilitate developer, seller, and Buyer transactions as they will be dealing in the same currency.

1.6 Eligible Credit-generating actions and BMP Guidelines

***Draft Recommendation – Eligible Credit-generating actions**: Conservation or management actions, known as best management practices ("BMPs"), which generate Credits, should be quantifiable and verifiable. A list of pre-determined, eligible BMPs for generating Credits in a Watershed by the relevant water quality agency would provide clarity to Trading Frameworks and Plans. Other BMPs can be eligible on a case-by-case basis as part of a permit or other agency review.*

[47] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1609 (encouraging programs for nutrients, sediments and other pollutants).

[48] *Id*. at 1610.

[49] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

Draft Recommendation – BMP guidelines*: Each Credit-generating BMP should include information that defines: A) an approved Quantification Method, B) the appropriate pre-project site condition to use for calculating the reduction, C) installation and maintenance quality standards, and D) ongoing performance standards to ensure that each BMP is consistently achieving the desired water quality improvements.* As appropriate, agencies may choose to assign differing uncertainty ratios (discussed in Section 4.1) to each BMP.

Commentary: Not all BMPs will be eligible to generate Credits for a given pollutant, Watershed, land use type, state, etc. Existing BMPs also vary in the specificity of guidance available for BMP design and maintenance and the accuracy of available Quantification Methods. The development of pre-determined, eligible BMPs by agencies and the EPA will lend confidence to those actions that are approved to generate Credits. Other components of BMPs will similarly be improved through such a process (e.g., criteria for effectiveness, design and maintenance standards, project implementation, and performance standards). As guidelines are developed for new or additional BMPs, there should be a process in place for each agency to review, reject, or approve/add new BMPs for a Watershed(s). Determining Baseline pollution reduction requirements and conditions for BMPs is discussed separately in Section 2.

Components of a BMP guideline for a practice eligible for trading should include:

- A description of the BMP, how it works, and its suitability for the Watershed;
- A technical analysis of predicted BMP effectiveness;
- A technical summary of Quantification Method, as described in the draft recommendation for quantifying Water Quality Benefit;
- Procedures for applying and documenting application of the Quantification Methodology;
- A description of where the BMP should be applied (appropriate Site Conditions);
- A description of the potential side effects and ancillary benefits;
- Design, installation, operation, and maintenance requirements;
- Monitoring requirements and performance standards;
- Procedures for validating and Verifying Credits; and
- Substantiating information.

Additional detail on recommended components of a BMP Guideline is provided in Appendix A.

1.7 Approving new and modified best management practices

This section describes elements of a general process for receiving and processing requests to approve new BMPs or modify existing BMPs for eligibility in trading programs. The general architecture of this process includes pre-proposal, practice review, and approval phases. Because of resource constraints at the state or Watershed level, it may be necessary to

incorporate this process into the NDPES permit review process or to only approve BMPs for Credit generation that have high levels of uncertainty.

***Draft Recommendation – Process for pre-approving eligible BMPs for trading**: To ensure the quality, suitability, and transparency of BMPs that are used to generate water quality Credits, some level of formal review and approval of BMPs could be used in trading programs. That formal review could include a quick screen to make sure all the necessary information is in place to facilitate a review.*

Commentary: Not all BMPs are appropriate for generating Credits; it's important to develop a system that can evaluate and incorporate those BMPs that are effective in improving water quality in a given Watershed and can be reliably quantified into Credits. As new BMPs or modifications to existing BMPs are proposed for pre-approved BMPs, states should seek to review and evaluate these proposals in a timely manner.

The scale at which BMPs are approved as eligible for trading will vary. In some cases, BMPs may be designated as eligible for trading statewide to avoid redundant evaluation of BMPs that are known to be widely applicable for all Watersheds in the state. Programs may also consider approving BMPs for trading at the Watershed level, particularly where the applicability of available information on the BMP is limited to that specific geography or in an NPDES permit. A tiered approach would involve selecting BMPs for use in a specific Watershed's trading program from a larger list of BMPs that have been approved for trading at the statewide level. Review bodies may differ across states. A water quality trading program may receive numerous requests to evaluate specific BMPs for inclusion in the program. A pre-review screening allows agencies to provide BMP proponents with guidance early on, weed out inappropriate proposals, and prioritize requests so that most effective BMPs are identified and supported for use. It will be easier for proponents to provide this information if agencies provide clear review criteria tied to information described in Section 1.6 and further detailed in Appendix A. Any kind of formal approval for a pre-approved BMP should be documented, as should rejections of proposals.

DRAFT

2. Determining Baseline & Additionality Requirements

Commented [BC4]: REVIEWERS: This section is quite different than the first version you read, and you have not seen this as part of the bigger document yet.

In this section:

- What is the Regulatory Baseline?
- What is the Trading Baseline?
- How is Baseline expressed?

"Baseline" (the threshold a Nonpoint Source is required to meet before trading) is one of the most challenging aspects of water quality trading. Setting Baseline for trading is challenging because it requires answers as to what Nonpoint Sources are *required* to do, versus what they *should* and reasonably *can* do. Answers to these questions are bigger than trading—which is a small, but important part of a broader strategy to reduction pollution from both point and Nonpoint Sources. Baseline is an important component of "Additionality" (the idea that Water Quality Benefits credited from a project must be in addition to the status quo and what should have happened without trading). This section focuses on Baseline.

Many sources generally describe Baseline requirements. For example, the U.S. EPA Water Quality Trading Toolkit for Permit Writers ("2007 U.S. EPA Trading Toolkit"), states that Baseline is equal to "the pollutant control requirements that apply to a Buyer and seller in the absence of trading."[50] Similarly, the 2003 U.S. EPA Trading Policy states that "pollutant reductions [should be] greater than those required by a regulatory requirement or established under a TMDL."[51] While it is generally agreed that Nonpoint Sources must meet "Baseline" prior to trading, it can be difficult to determine if a particular Watershed goal, law, or regulation actually imposes an actionable control *requirement* on an individual Nonpoint Source; where one does, it can be similarly difficult to ascertain how much of the Water Quality Benefit generated from a Nonpoint Source is additional, and therefore can be sold as Credits.

The Baseline question is further complicated by the fact that multiple sources of information may come into play when determining Baseline requirements. When setting Baseline, states have to look to applicable statutes and regulations, including local land use ordinances. Depending on how a TMDL is written and implemented, states may also need to look to TMDLs (and implementation plans) to set Baseline. States may also look to general Nonpoint Source control authority when setting Baseline requirements, or choose to impose a requirement that

[50] *See* U.S. EPA, Water Quality Trading Toolkit for Permit Writers, at 8 (2007), *available at* http://www.epa.gov/npdes/pubs/wqtradingtoolkit_fundamentals.pdf.

[51] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610.

a Nonpoint Source do something beyond its "business-as-usual" status quo. Thus, Baseline at a particular Nonpoint Source site can be derived from some combination of regulatory requirements, TMDL documents, general state Nonpoint Source control authority, and a state's desire to require Nonpoint Sources to go beyond their business-as-usual operations. Each state may decide to combine these sources of authority in different ways to derive the "Trading Baseline" applicable to a particular Trading Framework or Plan.

In this document, the "Trading Baseline" can be composed of several elements, depending on the state or Watershed:

- **Regulatory Baseline**: The level of pollutant load associated with specific land uses and management practices that comply with stated requirements in applicable, state, local, or tribal regulations.[52] These regulations are typically affirmative obligations or non-disturbance regulations (e.g., all farms must have nutrient management plans in place, or riparian vegetation may not be actively disturbed).
- **TMDLs**: The level of pollutant reductions a TMDL expects specific land sectors to achieve. The 2007 U.S. EPA Trading Toolkit notes that for a Nonpoint Source seller in a Watershed under a TMDL, the source's Baseline "would be derived from the [N]onpoint [S]ource's [load allocation]."[53] Deriving the required pollution reduction from a TMDL for an individual landowner can be challenging. Many TMDLs define Nonpoint load allocations ("LA") for entire sectors, thus making it difficult to translate LAs directly into a site-specific Trading Baseline. There is often additional ambiguity as to the time horizon for achieving TMDL objectives. Moreover, because TMDLs are not self-implementing, required implementation actions must be established by other supporting agencies.
- **State's General Authority**: Some states may have general, broad authority to control Nonpoint Source pollution,[54] which can be used to influence Baseline levels for a particular Watershed or trading program. Similarly to TMDL LAs, general state Nonpoint

[52] *See* 2007 U.S. EPA Trading Toolkit, at 5.

[53] *See* 2007 U.S. EPA Trading Toolkit, at 29.

[54] *See, e.g.,* RCW 90.48.080 ("It shall be unlawful for any person to throw, drain, run, or otherwise discharge into *any of the waters of this state*) (emphasis added). Washington Dep't of Ecology authority to regulate Nonpoint Sources under this law was recently upheld by the Washington Supreme Court. Lemire v. Washington, No. 87703-3 (2013). Likewise, all dischargers are subject to regulation under California state law. Cal. Water Code § 13260(a)(1). On the other hand, the federal CWA definition of "Point Source" specifically excludes "agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. § 1362(14).

authorities may not always establish clear BMP or management requirements for trading programs to incorporate.

- **Beyond "Business-as-Usual"**: Some trading programs may choose not to give Credit for BMPs that are already customary to the industry, or that were already planned because of immediate cost savings for the Nonpoint Source operator.

At a minimum, all Nonpoint Sources should meet Regulatory Baseline requirements. However, if a TMDL or general state Nonpoint Source authority exists, or a state wishes to impose a requirement that actions must be above a Nonpoint Source's status quo operations, a state can also choose to set its Trading Baseline at a level above Regulatory Baseline.

This section provides some recommendations to those building Trading Guidance or frameworks on how to identify Regulatory Baseline, and how to derive TMDL and a State's General Authority requirements. This section also includes recommendations for states on how they can use TMDLs to better clarify Baseline expectations, and how Baseline requirements can be operationalized and expressed in Trading Guidance, frameworks, or plans.

2.1 Deriving Baseline requirements

Trading Baseline requirements are derived from a combination of state, local, and tribal land management requirements, state Nonpoint regulatory authorities, and from TMDLs or their equivalent. As each of these guideposts is developed, there are opportunities to provide information important to those building Trading Guidance or Frameworks. Trading was not considered in many TMDLs, and as a result, may not directly inform the objectives of a trading program.

2.1.1 Regulatory Baseline

Regulatory Baseline is the level of pollutant load associated with specific land uses and management practices that comply with stated requirements in applicable, state, local, or tribal regulations.

***Draft Recommendation**: Prior to selling Credits, every Nonpoint Source Project Developer must comply with all enforceable state, local, or tribal affirmative or non-disturbance regulations that require a specific action at the property.*

Commentary: Depending on location and land use, the regulations applicable to a Nonpoint Source Project Developer will vary. Regulatory Baseline requirements can typically be found in state laws and regulations (i.e., animal exclusion fencing or minimum riparian buffer widths)

and/or local ordinances. As an example of Regulatory Baseline, an Oregon Nonpoint Source located on forestland must "grow and retain" a riparian buffer that conforms to width and stem density requirements,[55] and only the Water Quality Benefit generated beyond those requirements can be sold as Credits.

a. Informing Baseline through a TMDL

Trading Guidance may look to TMDLs—in particular load allocations (LAs)—to inform the amount of pollutant load that a TMDL may require to be reduced on top of what is already required under Regulatory Baseline requirements. The 2007 U.S. EPA Trading Toolkit notes that a Nonpoint Source's Baseline "would be derived from the Nonpoint Source's LA[,]"[56] but does not specify how to derive Baseline for particular sites from the LA.[57] It is therefore up to states and TMDL-implementing agencies to determine the site-specific requirements that would be used to set Trading Baseline.

***Draft Recommendation – Building a TMDL to inform Trading Baseline**: If trading is considered a possibility for meeting water quality goals in a Watershed, considering several actions early on will make it easier to inform a Trading Baseline. This includes clearly defining LAs, the expected role of trading in achieving TMDL goals, and making clear statements about the role and timing of trading in implementing the TMDL.*

Commentary: This draft recommendation is not intended to influence the entire TMDL development process, but to provide some ideas on how TMDLs can provide clearer direction for trading. TMDLs that include different scenarios, different scales or timeframes for applying load reduction targets, and Nonpoint Source models that are sensitive enough to capture reach or group-of-landowner level changes can help provide the technical basis for establishing Trading Baseline requirements. As one develops or revises a TMDL, consideration of the following questions may make it easier to derive Trading Baseline from TMDLs:

- How are LAs modeled and completed? Can a trading program use the models easily to move from a sector-wide LA to a LA for an individual source? If individual-level LAs

---

[55] *See* Or. Admin. R. 629-640-0000(2). For example, on fish bearing streams, operators "shall retain" all understory vegetation within 10 feet of the high water level, all trees within 20 feet of the high water level, and all trees leaning over the channel. *Id.* 629-640-0100(2). Moreover, operators must retain downed wood in riparian management areas, at least 40 live conifer trees per 1000 trees, and trees/snags at least six inches or greater in DBH. *Id.* 629-640-0100(3)-(6).

[56] *See* 2007 U.S. EPA Trading Toolkit, at 29.

[57] *Id.*

cannot be identified in the TMDL, does the TMDL provide some mechanism for translating TMDL Nonpoint Source goals to the individual landowner level needed to implement trading?

- Are WLAs, LAs and excess pollutant loads expressed in the same type and unit of pollution?
- Does the TMDL make it clear whether a LA equals an expected amount of pollution from Nonpoint Sources, or whether it is referring to LAs as a targeted reduction of excess loading amount?
- Trading may also be a component in determining a TMDL's reasonable assurances. How much are the WLAs in the TMDL dependent on the expected role of trading in the Watershed[58] (i.e., how much excess load do the TMDL writers expect will be reduced by trading, and is the stringency of the WLAs reasonable in light of that assessment)?
- Does the water quality agency provide sufficient guidance in the TMDL as to what reductions or types of actions, timing, and sequencing it expects Designated Management Agencies (DMAs) will include in TMDL Implementation Plans? In particular, does the TMDL clearly define the trading-related expectations of Nonpoint Sources (e.g., minimum BMPs, amount reduction)?

b. TMDL Implementation

In terms of implementation, the CWA only requires that TMDLs "shall be established at a level necessary to implement the applicable water quality standards [,]"[59] but it does not require that TMDLs be completely implemented within a specific timeframe (unlike technology-based Effluent Limit standards[60]). Therefore, TMDL Implementation Plans provide important guidance as to the timing and sequencing of TMDL implementation—including trading. Currently, many TMDL Implementation Plans lack clarity as to when desired future conditions will be attained, and what sequence of actions (and when) will be necessary to reasonably assure progress toward water quality standards over the longer-term. This often leads to difficulty in TMDL

[58] "If Best Management Practices (BMPs) or other Nonpoint Source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for [N]onpoint [S]ource control tradeoffs." 40 C.F.R. 130.2(i).

[59] 33 U.S.C. § 1313(d)(1)(C).

[60] *See* 33 U.S.C. § 1311(b). TMDL-based targets are not constrained by the shorter timeframes associated with meeting the technological goals of the CWA. Longview Fibre Co. v. Rasmussen, 980 F.2d 1307 (9th Cir. 1992) (noting that "the 'timetable for achievement of objectives' limitations of section 1311 do not apply to section 1313 TMDL Effluent Limitations"); NEDC v. Oregon DEQ, No. 9905-05144, 2000 WL 35562955, at *17 (D. Or. 2000) ("section 1311 compliance deadlines do not apply to section 1313 TMDL's").

implementation, and confusion as to which entity is going to address what amount of the problem, and by when (e.g., do LAs need to be met in 5 years or 75 years?). In particular, this can confuse setting Trading Baseline.

To address these issues, states may choose to articulate implementation timelines in TMDLs or in TMDL Implementation Plans. "Phased Baseline" requirements for trading that become more stringent over time, are one way that these timelines can be used to set Baseline requirements for trading.

Draft Recommendation – Establishing Phased Nonpoint Source Load Reduction Targets in TMDL Implementation Plans: *TMDL Implementation Plans can help inform Trading Baseline requirements by specifying expected pollution reductions or types of BMPs with clear timing and sequencing. When considering interim targets, a TMDL Implementation Plan can incorporate the timing needed to finance, implement, report, and adapt strategies to meet LAs (including trading strategies).*

Commentary: To our knowledge, no Trading Frameworks or plans have yet implemented phased Baseline approaches, but several states provide the opportunity to phase in TMDL reductions over time as part of implementation (e.g., the Chesapeake Bay TMDL,[61] Florida law,[62] and the Shelter Island TMDL in San Diego[63]). A phased approach may not be desirable in some Watersheds (e.g., where Point Sources are the major contributors of pollutions).

One challenge with phased implementation is determining what happens if Nonpoint Sources do not meet their interim reduction goals. Another challenge is that setting reasonably achievable milestones at specific time intervals will take time and could add complexity to writing TMDL Implementation Plans. Moreover, LA, WLA, and "Human Use Allowance" values in the TMDL would possibly need to be adjusted in the future based on actual achievement of reduction milestones (which also might raise questions of equity from Point Sources if they are

[61] *See* EPA, Chesapeake Bay TMDL, at § 7 (2010) (noting the possibility that Point Source allocations could be reduced if Nonpoint Sources do not obtain reduction goals).

[62] Florida Statutes § 403.067(7)(a)(1) ("In developing and implementing the TMDL for a water body, the department … may develop a basin management action plan that addresses some or all of the Watersheds and basins tributary to the water body. Such plan … *may provide for phased implementation of these management strategies to promote timely, cost-effective actions as provided for in s. 403.151*") (emphasis added).

[63] California Regional Water Quality Control Board, San Diego Region, Resolution No. R9-2005-0019, at 3-4 (2005), *available at* http://www.waterboards.ca.gov/sandiego/water_issues/programs/Watershed/docs/swu/shelter_island/2005_0019.pdf.

forced to carry more of the excess load problem should Nonpoint Sources fail to perform[64]). These revisions could impact the amount of trading that a source would be able to engage in, and could impact the value of the trades already under way. Further, Point Sources may prefer a fixed-price grey technology option rather than trade for green infrastructure under a scenario where Credit availability may decline over time. Finally, under a phased approach, there is still the possibility that Point Sources would need to install technology in the future if TMDL goals have not been met. On the other hand, a phased approach could incentivize early action where more Credits are available earlier than in later phases.

Ultimately, in order to use a phased implementation approach, states and U.S. EPA would need to develop and use systems that track and review progress toward TMDL goals in quantifiable terms throughout the Watershed. Regulators would need a robust set of data to identify appropriate Adaptive Management actions, and to determine whether it is necessary to change water quality standards or use designations. Thus, this approach requires development of systems to track and account for the reductions that Nonpoint Sources achieve over time. These systems are not a unique need for trading, but may not exist for all states or TMDLs.

2.1.2 Using a State's General Authority to Inform Baseline

States may also look to general Nonpoint Source control authority in state law, if it exists for that state, as a source for establishing site-specific Baseline requirements.

***Draft Recommendation – State's General Authority**: If states have general Nonpoint Source control authority, this authority may be used as the basis for setting Baseline requirements in addition to Regulatory Baseline and TMDL implementation requirements (if applicable).*

Commentary: Some states possess general, broad authority to control Nonpoint Source pollution.[65] This authority is not necessarily translated into clear BMP or management

---

[64] The CWA and its implementing regulations do not discuss equitable considerations, but recent case law discussing TMDL implementation has noted this as an important consideration. *See* Am. Farm Bureau Fed'n v. U.S. E.P.A., No. 11-CV-0067, 2013 WL 5177530, at *35 (M.D. Pa. 2013) (discussing the equitable distribution of the burden of reducing pollutant loads and questioning the practicality of "pin[ning] the hopes of attaining the statutorily-mandated goal of achieving water quality standards on the three tidal states [and not recognizing the impacts of upstream states] would not only be inequitable, but also impractical and likely impossible.").

[65] *See, e.g.,* RCW 90.48.080 ("It shall be unlawful for any person to throw, drain, run, or otherwise discharge into *any of the waters of this state*) (emphasis added). Washington Dep't of Ecology authority to regulate Nonpoint Sources under this law was recently upheld by the Washington Supreme Court. Lemire v. Washington, No. 87703-3 (2013). Likewise, all dischargers are subject to regulation under California state law. Cal. Water Code §

requirements, thus making it a very flexible tool for the state agency. This flexibility may also create some uncertainty for what a Trading Baseline should be. To the extent states can translate broad, general authority into specific BMPs, expected reductions, etc., it will be easier to incorporate these requirements into known and predictable Trading Baseline.

2.1.3 Using Business-as-Usual to Inform Baseline

***Draft Recommendation – Business-as-usual**: States may choose to define Baseline criteria to ensure creditable projects are going beyond "business-as-usual" (e.g., not counting BMPs that are already customary to the industry, or that were already planned because of immediate cost savings for the operator).*

Commentary: Business-as-usual criteria for determining Additionality are intended to limit Credits from actions that would have occurred without trading, either because they are a part of industry norms or because they represent sufficient cost savings to the landowner such that the landowner would be incentivized to implement a BMP without trading. Business-as-usual criteria are common in carbon offset programs,[66] but have been difficult to operationalize and implement. For water quality trading, other components of Trading Baseline will often more than cover "business as usual" criteria. Using business-as-usual criteria to determine Additionality can be difficult to define, track and Verify.

2.2 Detailing Trading Baseline at Individual Project Sites

This section discusses: (i) setting Base Year for establishing pre-project Site Conditions, (ii) how Baseline can be expressed, (iii) individual vs. group-level attainment of Baseline requirements, (iv) sequencing of Baseline and Credit generating activities, and (v) use of cost-share and conservation funding toward meeting Baseline requirements. These principles generally apply in all Baseline contexts.

2.2.1 Establishing Base Year for Calculating the Water Quality Benefit at Project Sites

---

13260(a)(1). On the other hand, the federal CWA definition of "Point Source" specifically excludes "agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. § 1362(14).

[66] *See, e.g.,* Cal. Code Regs., tit. 17, § 95802(4) (defining "Additionality" in carbon trading as beyond laws and regulations, and exceeding "removals that would otherwise occur in a conservative business-as-usual scenario."); *id.* § 95802(34) ("'Business-as-Usual Scenario' means the set of conditions reasonably expected to occur within the offset project boundary in the absence of the financial incentives provided by offset credits, taking into account all current laws and regulations, as well as current economic and technological trends."); Verified Carbon Standard, Program Guide v. 3.5, at 11 (2013), *available at* http://www.v-c-s.org/sites/v-c-s.org/files/VCS%20Program%20Guide%2C%20v3.5.pdf.

Trading programs vary as to the date after which implemented BMPs become eligible to generate Credits (i.e., the "Base Year").

***Draft Best Practice – Trading program Base Year**: The trading "Base Year" may be set as the date on which a project is enrolled in a Trading Framework or Plan. However, if regulators seek to reward early action, regulators may approve a "Look Back Period" that establishes the Base Year as the date the TMDL is issued, or the date a Trading Framework or Plan is approved. If the Base Year is a point in the past, projects completed between the Base Year and the inception of the Trading Framework or Plan must demonstrate conformity with important Trading Guidance, Framework or Plan requirements in order to be eligible to sell Credits.*

Commentary: The easiest and most straight-forward approach to Base Year is to establish pre-project Site Conditions at the time an individual project is enrolled in an approved trading program. This approach may disincentivize early adoption of BMPs (e.g., farmers may choose not to implement or continue BMPs leading up to a new TMDL or renewed NPDES permit with trading included, hoping instead to implement those practices once the Trading Framework or Plan is in place, and Credits can be sold).

To address this disincentive, regulators may consider "looking back" to a date prior to the current year. A look-back period can maintain the incentive for early BMP adoption by allowing documented improvements in practices to generate Credits when they are implemented within a fixed number of years of a trading program's establishment. Under this approach, Credits from these already-installed BMPs would be calculated using the same methods, and the same Baseline requirements and approved ratios would still apply.

There are multiple approaches available to set the look-back period. One approach is to look back over a short period prior to the beginning of trading. For example, the Ohio Basin program allows a three-year look-back period.[67] Another approach is to look back to the year a TMDL was implemented, and set that as the Base Year. This approach is simple if the TMDL was recently published, but is less desirable if the TMDL was approved a number of years prior. A third approach is to allow all BMPs to qualify, regardless of when they were installed. Maryland allows Credit generation for any non-structural BMP implemented on an annual cycle (e.g., cover crops), even if that BMP was used prior to signing a TMDL.[68] These last two approaches

[67] *See* EPRI, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Project, App. E-4, § 4.B (2009), *available at* http://wqt.epri.com/pdf/ORB%20Trading%20Plan%208-1-12%20final.pdf (noting 3-year look-back period for establishing Baseline conditions for agricultural Nonpoint Source Credit generators).

[68] *See* Maryland Dep't of Agriculture, Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, Phase II – A Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits, at 11 (draft

are intended to prevent landowners from stopping beneficial practices as a way to generate more Credits, but on the other hand, these last two look-back approaches may create the appearance that Credit purchasers are simply buying Water Quality Benefits that already occurred (especially if the benefit occurred a number of years in the past) and not new, additional benefits.

2.2.2 Expressing Baseline Requirements

Draft Recommendation – Expressing Baseline requirements*: Baseline requirements can be expressed as A) an extra amount of load that must be reduced by a Nonpoint Source at a site (expressed as a % of the total overall load, or as a numeric amount); B) as a total amount of extra Credits that must be purchased by a Point Source; or C) a minimum set of BMPs or actions that must be installed at a site. To the extent possible, the expression of Baseline should be outlined in state guidance or a Watershed framework, the permit, the TMDL, and/or the TMDL Implementation Plan.*

Commentary: Baseline is expressed in a variety of ways because it draws from a variety of sources. Some trading contexts require the adoption of a minimum set of BMPs (e.g., a farm plan or filter strips) prior to allowing a Nonpoint project to generate Credits, whereas other trading contexts require Nonpoint Sources to generate a percentage of pollution reduction (e.g., 20% reduction in nutrient loading) prior to allowing that Nonpoint Source to sell Credits. Following are the pros (+) and cons (-) associated with different expressions of Baseline.

- *"Technology-Based" (Minimum BMPs as Baseline)*: Virginia,[69] Pennsylvania,[70] and Colorado[71] express Baseline this way:

2008) ("Credits can be generated from agronomic nutrient reduction practices, that do not count towards the Baseline requirements, Agronomic practices reduce or minimize surface, groundwater or air emissions, such as; manure injection, reductions in nitrogen fertilizer application, precision agriculture, cover crops, no-till, etc. These are considered an annual practice for the year they are generated, regardless of what year the practices were first initiated.").

[69] Virginia Dep't of Environmental Quality, Trading Nutrient Reductions from Nonpoint Source Best Management Practices in the Chesapeake Bay Watershed: Guidance for Agricultural Landowners and Your Potential Trading Partners, at 3–5, *available at* http://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/VANPSTradingManual_2-5-08.pdf ("You are presumed to meet the [B]aseline level of nutrient reduction if you implement all the following BMPs that are applicable to your operation" including soil conservation, nutrient management, cover cropping, livestock stream exclusion, and riparian buffer installation).

[70] Pa. Code ch. 96.8(d)(3)(A)-(B).

- BMPs are implemented at all sites where trading is to take place. This works well when required BMPs are defined in TMDL implementation plans and/or state law or regulations, where BMP efficiency is consistent throughout the Watershed, and adoption is likely;
- Rewards landowners who have already implemented required BMPs early and have already met Baseline;
- Ensures that important, but otherwise costly, BMPs are implemented rather than just the most cost-effective or easy to implement BMPs;
- Required installation of standard BMPs at all project sites can reduce flexibility for farmers to design BMPs that maximize pollutant reductions and meet the needs of their site and operations; and
- Tracking minimum BMP installation could require extra site visits to confirm those BMPs are performing as expected, which may be time-consuming and subjective.

- *"Performance-Based" at the Nonpoint Source Site Level (Numeric or % Load Reduction Target as Baseline)*: Maryland[72] and Pennsylvania[73] express Baseline as site-specific reductions in guidance and regulations, respectively.
  - Since reduction targets can be set in the same units as TMDLs, it is easier to track progress from trading in the same metrics and targets used to develop TMDLs;
  - When quantifying Credits from a site, it is easier to separate Baseline from additional Credits (otherwise, the analysis must include calculating/modeling impacts of each Baseline BMP at each site—which can increase the cost of quantifying Credits);
  - Provides more flexibility to Project Developers in how they achieve pollution reductions. Quantifiable targets are more certain, and thus easier to plan for in terms of cost and sequencing, because the amount of load reduction attributable to Baseline requirements can be easily calculated;
  - Expression at the Nonpoint Source site level suggests that individual Nonpoint Source Project Developers are making contributions to Baseline requirements (thus

---

[71] Among other options, the Colorado policy lists implementation of BMPs as a mechanism for satisfying Nonpoint Source Baseline. See Colorado Dep't of Public Health and Environment, Water Quality Control Division, Pollutant Trading Policy § VIII (2004).

[72] Maryland Dep't of the Environment, Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, § 4.1 (2008) ("The Department will require a 5% retirement ratio applied to each point-source generated credit. This ratio may be adjusted over time.").

[73] Pa. Code ch. 96.8(d)(3)(C) (requiring Nonpoint Sources to either install certain minimum BMPs, or create an additional 20% reduction prior to being able to sell Credits).

reinforcing the notion that Nonpoint Sources are carrying their fair share of the burden);
    - High priority BMPs may not be implemented in favor of BMPs with a lower cost per unit of the target pollutant removed (i.e., landowners might select BMPs based on the relative cost of meeting Baseline requirements); and
- "Performance-Based" at the Watershed Level (% Program-level Load Reduction Target as Baseline):
    - May be easier to quantify Baseline obligation for purchasing Point Source entities (e.g., express as an extra % or amount of the overall reduction amount being purchased);
    - Using absolute load amounts for a Watershed may introduce issues of equity because it may be far easier for "late adopters" to meet the required % reduction than "early adopters" who have already taken actions. The Chesapeake TMDL is somewhat unique in that it sets specific load reduction targets by reach, supporting a percent reduction approach to Baseline[74]; and
    - Expression at the Nonpoint Source site level suggests that individual Nonpoint Source Project Developers are making contributions to Baseline requirements, but this nexus is lost if expressed on the demand side as a Watershed-wide goal.

2.2.3 Individual vs. Group-Level Attainment of Baseline Requirements

***Draft Recommendation – Use of individual or group-level Baseline requirements**: An individual Project Developer should be able to generate Credits upon meeting its own Baseline requirements, independent of the actions of neighboring landowners in the relevant Watershed. Where possible, Trading Guidance and frameworks should incentivize grouped implementation of BMPs in a Watershed (e.g., through reduced ratios for collective action, increased availability of cost share to meet Baseline, etc.).*

Commentary: Several states allow individual landowners to generate Credits when their individual Baseline requirements have been met.[75] It may not be fair to predicate Credit-

[74] U.S. EPA, Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment § 9.1 (2010), *available at* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/CBayFinalTMDLSection9_final.pdf (noting load reduction targets for all 92 Chesapeake Bay segments); *id.* at App. Q, *available at* http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/AppendixQ_AnnualTMDLs_final.xls (providing detailed annual WLAs and LAs).

[75] *See* World Resources Institute, Comparison Tables of State Nutrient Trading Programs in the Chesapeake Bay Watershed, at 11, Tbl. 7 (2011), *available at* http://pdf.wri.org/factsheets/comparison_tables_of_state_chesapeake_bay_nutrient_trading_programs.pdf.

generation eligibility (i.e., Baseline requirements) on the willingness of all proximate landowners to participate in a program.[76] Nonetheless, although required group action may create barriers to entry, it may make sense to incentivize group action as much as possible via mechanisms such as reduced Trading Ratios and Baseline requirements, and/or additional access to cost share funding.

2.2.4 Sequencing of Baseline and Credit Generating Activities

***Draft Recommendation – Sequencing of meeting Baseline requirements**: Project Developers* can meet their Baseline requirements simultaneous to generating Credits.

Commentary: Project Developers can meet their Baseline requirements simultaneously with the actions needed to generate Credits (as opposed to first implementing the BMPs to meet Baseline and then later implementing the BMPs to generate Credits). For example, this would allow a Project Developer to implement a set of BMPs that both meet and go beyond Baseline to generate Credits. This concept refers to actions taken after a Base Year (*See* Section 2.2.1).

2.2.5 Use of Public Dollars Dedicated to Conservation to Satisfy Baseline Requirements

Draft Recommendation – Allowable funding sources to meet Baseline requirement: Project Developers may use "Public Dollars Dedicated to Conservation" or any other source of funding to help meet Baseline requirements or other Watershed-wide Nonpoint Source reduction goals in the TMDL. Where Public Dollars Dedicated to Conservation are used, the amount and purpose of those funds need to be disclosed as part of the Credit issuance process. Actions funded with Public Dollars Dedicated to Conservation should not be used to generate Credits for compliance (See Section 5 for more complete discussion of payment Stacking).

Commentary: Many programs allow for the use of Public Dollars Dedicated to Conservation (defined in Section 5.3 of the Draft Best Practices) to meet Baseline requirements.[77] Cost share funds such as federal Farm Bill programs, EPA section 319 grants, and state sources are routinely used to help Nonpoint Sources reduce pollution and meet conservation goals, including those outlined in TMDLs. USDA regulations appear to allow its funds to be used to

---

[76] *See* Montana DEQ, Response to Comments on Montana's Draft Policy on Nutrient Trading, at 1, Comment 2 Response (2011), *available at* http://deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/DraftTradingPolicyRespComm10_11.pdf ("Defining 'Baseline' so that all Nonpoint Source contributors need to achieve (collectively) the Watershed load allocation before a Credit may be generated would eliminate the majority of trading opportunities and greatly reduce the effectiveness of this policy.").

[77] *See id.* (noting that Maryland, Pennsylvania, Virginia and West Virginia allow cost-share funds to meet Baseline).

meet Baseline requirements.[78] If public cost share is used to meet Baseline, that information should be available so that Credit Buyers, agencies, and the public may verify that Public Dollars Dedicated to Conservation are being used to meet Baseline.

DRAFT

[78] *See, e.g.,* 7 C.F.R. § 1466.36 ("NRCS recognizes that environmental benefits will be achieved by implementing conservation practices funded through EQIP, and environmental credits may be gained as a result of implementing activities compatible with the purposes of an EQIP contract."); 7 C.F.R. § 1410.63 (similar provision for CRP).

3. Quantifying Water Quality Benefits at the Project Site

Commented [BC5]: REVIEWERS: Sections 3 and 4 were significantly re-organized

In this section:

- What makes a good Credit Quantification Method?
- What kinds of methods are available?
- At what scale should Quantification Methods operate?
- How are Credit Quantification Methods documented?

Credit quantification relies on the best available science to predict and/or measure the pollution reduction from BMPs implemented (i.e., "Water Quality Benefits"). A project's Water Quality Benefit is the environmental improvement directly attributable to the Credit-generating actions.

Calculating the Water Quality Benefits provided at the project site ("edge-of-field Water Quality Benefit") is the first step in determining the amount of Credits available to sell. As discussed in Section 4, however, the edge of field Water Quality Benefit is not always equal to the Credit quantity that may be sold. The Water Quality Benefit that can be sold as Credit may be changed in quantification efforts (estimating delivery of a pollutant reduction from the edge of the field where it is generated into the waterway and Attenuation during transport instream) or through application of policy or risk management mechanisms (Baseline or eligibility requirements, Trading Ratios, Reserve Pool requirement, etc.). This section discusses the steps necessary to quantify Water Quality Benefits at the edge-of-field. Section 4 discusses adjustments to edge-of-field Water Quality Benefit to account for quantification of delivery and Attenuation, policy, and risk management.

The first step in the process to quantify edge-of-field Water Quality Benefit is to measure "pre-project conditions," and then to estimate "post-project conditions" at the site. The Project Developer will then associate a pollutant load outcome with both the pre-project and the anticipated post-project conditions (known as "pre-project performance" and "anticipated post-project performance"). Water Quality Benefit at the project site (or "edge-of-field") is often calculated by subtracting "anticipated post-project performance" (as measured or modeled) from the "pre-project performance." Represented as an equation:

*Water Quality Benefit (edge-of field) = anticipated post-project performance – pre-project performance [which may include Baseline reductions]**

*Note: Where the site does not meet applicable requirements, the Pre-Project Condition, and thus Pre-Project Performance, may be adjusted to reflect those actions or load reductions required as part of Trading Baseline so that these actions or load reductions are not included as part of the edge-of-field Water Quality Benefits. Baseline may also be accounted for in conjunction with the adjustments discussed in Section 4 (Attenuation, Trading Ratios, etc.).

This calculation typically occurs using one or more of the following types of Water Quality Benefit Quantification Methods: modeling, pre-determined rates/ratios, and Direct Monitoring.

The recommendations in Section 3 discuss 1) the general characteristics of Quantification Methods that are desired when quantifying Credits in a trading program (*repeatable, sensitive, accurate, practical, and transparent)*; 2) the methods available for quantifying water quality improvements at the project site (i.e., pre-determined rates, modeling, or Direct Monitoring) and a discussion on when each type of Quantification Method may be most appropriate; 3) the need to identify field-scale Quantification Methods; and 4) how to perform a project site assessment (i.e., how to measure pre-project conditions and anticipated post-project conditions).

3.1 Characteristics of a Credit Quantification Method

Draft Recommendation – Quantification Methods*: Methods for quantifying Water Quality Benefits from BMPs should be repeatable, sensitive, accurate, practical, and transparent, especially when used for trading. Methods that have a longer history of usage and application and a documented track record are preferred where available. These methods are often developed as part of a TMDL or comparable process. Documentation of approved methods should include a thorough technical review, procedures for consistent application, and a plan for improving the method over time. Methods and associated documentation should be publicly available, and, where feasible, vetted through a public- and peer-reviewed process.*

Commentary: The following was adapted from Willamette Partnership's *In It Together*.[79] A Quantification Method for water quality trading should be:

- *Accurate*: representative of true pollution load reductions. Assessments of uncertainty, like reporting confidence intervals associated with model results, can help to represent the level of accuracy;
- *Repeatable*: if different people apply the method using the same data, location, and factors, the model will deliver a similar result (i.e., not overly subjective). Protocols or user guidance can greatly improve the consistency with which a method is applied;
- *Sensitive*: variation in quantified Credits reflects actual differences in the water quality indicators being measured, and not stochastic or background variation; and

[79] Willamette Partnership, USDA Office of Environmental Markets, Pinchot Institute for Conservation, and World Resources Institute, Vol. 2: In it Together: A How-to Reference for Building Point-Nonpoint Water Quality Trading Programs 20 (2012), *available at* http://willamettepartnership.org/in-it-together.

- *Transparent*: easy to understand and well-documented relationship of inputs and indicators to the overall estimate of pollution reduction. Ideally, methods are well vetted in the scientific community and posted in the public domain for use by anyone without charge.

A Quantification Method should also be practical and economical to set up and apply, easy to use for the targeted user group, and compatible with other relevant models (e.g., TMDL models) so that its outputs can plug easily into evaluations of overall program performance.

Quantification tools can always be improved, and sometimes the best way to improve them is through use (See Section 11 for more on Adaptive Management of Quantification Methods). In addition to confirming that projects are in place and conforming to quality and performance standards, trading programs should seek to monitor a representative subset of projects and to collect the data needed to improve quantification tools over time. The data needed to validate quantification tools/models can be collected by a number of measurement strategies (e.g., installing direct measurement devices at a representative number of sample project sites). For nutrients, appropriate model Validation data might include various types of water and soil samples, and flow discharges. For temperature, appropriate data might include characterizations of shade-generating features on the project site (e.g., riparian vegetation type), measurements of effective shade, and/or upstream and downstream temperature measurements (e.g., for tributary flow augmentation). Importantly, this data would not be used to determine compliance for the permittee purchasing Credits within the current permit cycle, but would be used to improve the models/quantification tools (in terms of how many Credits that model/tool should allow to be generated by BMPs in the future) that drive trading.

3.2 Standard methods quantifying water quality improvements for trading

Quantification Methods can be grouped into three general types: A) pre-determined rates/ratios, B) modeling, and C) Direct Monitoring.

A. Predetermined rates: This approach involves setting standard values for water quality improvement based on the best available science. These values are often expressed as ratios or percentages (e.g., 50% of the phosphorus load will attenuate between points A and B), or absolute loads (e.g., use of cover crop will reduce sediment loading by 35%). Some rates are grounded in extensive research and modeling, while others are adapted from relevant literature.
B. Modeling: This approach involves predicting the fate of pollutants loaded into a waterbody using mathematical simulation procedures. Many water quality trading programs use modeling to estimate Water Quality Benefit and Attenuation of pollutants.
C. Direct measurement: This approach includes monitoring of both water chemistry (e.g., river turbidity or temperature) and surrogates for water quality (e.g., stream bank erosion or shade from riparian vegetation). This method is often used for ambient water quality monitoring at the reach- or Watershed-scale, and serves as an important tool for calibrating

and validating models. Direct Monitoring is not typically used to quantify water quality Credits in trading programs because it is both difficult to causally link BMPs to measurable improvements at a single site, and it is the most costly measurement system to implement.

***Draft Recommendation – Use of standard approaches to quantifying Water Quality Benefits**: Trading programs should have standard methods or models for quantifying Water Quality Benefit, and should clearly state which versions of the method(s) are approved for use. Quantification Methods selected should be those used to develop a TMDL (or similar Watershed analysis) or should be consistent with the approaches used in the relevant TMDL or similar Watershed analysis. Methods should also be well-referenced and well-documented. Where a permittee commits to using an approved method and version, the regulator overseeing the permittee's Trading Solution should continue to support (e.g., provide guidance on data collection, troubleshooting for calculations, etc.) that version for a set period of time (e.g., one permit cycle).*

***Draft Recommendation – Types of Quantification Methods**: Trading programs should use the most appropriate method to quantify Credits. Methods might be different for different BMPs. The types of available methods to choose from include: A) use of pre-determined pollution reduction rates; B) use of water quality models; and C) use of Direct Monitoring. Where standard methods do not apply, trading programs may also consider project-specific water quality improvement or load reduction estimates.*

A. <u>Pre-determined pollution reduction rates</u> are the most appropriate method for quantifying Credits where sufficient data exist to develop these rates for a specific basin. Justification for pre-determined rates should include documentation of how the rates were selected, why those rates are appropriate for and/or are transferable to the proposed trading geography and conditions, and some guidance and analysis about the likely sources of variation in performance of those BMPs based on local conditions. Prior to approving pre-determined rates, state agencies should perform a technical review and formally approve the rates in a manner similar to that described for modeling approaches.

B. <u>Water quality models</u> are the most appropriate method for quantifying Credits when data are not sufficient to develop location-specific pre-determined pollution reduction rates for individual BMPs. Water quality models are also most appropriate when Credits are based on water quality improvements attenuated from points of generation to points of compliance or concern. Models should undergo calibration and Validation based on best available water quality monitoring data, as well as technical review(s), before being approved by state agencies for use in trading programs.

C. <u>Direct Monitoring</u> may be an appropriate method for quantifying Credits in those cases where the Project Developer can "control" enough of the factors shaping water quality to show a measurable improvement in water quality (e.g., improvements across an

irrigation district where inputs and outputs can be closely monitored in one or a set number of ditches and drains). To use Direct Monitoring, a program should require a clear monitoring/sampling plan and a quality assurance plan approved by the state agency, or its designee. The Project Developer needs to use instrumentation capable of capturing water quality samples at intervals frequent enough to: A) create an estimate of average water quality improvement over a specified time (e.g., year, season, or month), and B) produce estimates of variation within that time period.

Where standard Quantification Methods are inappropriate or insufficient, such as for unique, large-scale restoration efforts (e.g., large-scale treatment wetlands or floodplain connectivity), it may be most appropriate to develop a project-specific calculation of water quality improvement/load reduction. Project-specific methods will need to demonstrate adherence to the same standards (e.g., repeatable, sensitive, transparent, and ideally vetted through a public- and peer-reviewed process) that are applied to program-approved models and tools. Review of these projects will require significant effort by agency staff, and so is likely most appropriate for projects that will already require substantial design and review, and will generate substantial water quality improvements. If the action is regularly implemented, project specific calculation methods may be adopted as trading program-approved quantification techniques provided that the calculation proves to be robust and can be appropriately applied beyond the original project location.

Commentary: There are considerations associated with each type of Quantification Method discussed below.

A. Pre-determined rates:

BMP effectiveness rates provide a high level of repeatability and predictability in a trading program because there is no need to verify user-determined inputs into models, or worry about errors in Direct Monitoring data collection. Yet, BMP efficiency rates by themselves are not as sensitive to site-specific conditions as modeling approaches. Many of these rates are also only relevant in the local geographic area for which they were developed.

Start-up costs to generate these rates may be high where relevant studies or modeled values are not available, but the cost of maintaining the approach over time is likely to be low. Ongoing costs would be associated with obtaining the long-term data necessary to evaluate and improve Attenuation rates or absolute load reduction.

If pre-determined rates are used, they should be accurate within the region or Watershed of use. Rates should not be automatically transferred beyond their region of development (i.e., rates developed for nutrient trading in the Chesapeake Bay may not always be applicable to trading in the Puget Sound). Instead, the methods to develop those rates should be applied to generate contextually appropriate rates calculated for the new geographic area. When

predetermined rates cannot be tailored to the region of application, this Quantification Method is not recommended because results will likely be too coarse.

B. Modeling

Where existing models can suit program needs, and where sufficient local data is available for calibration and Validation, models can provide more site-specific information than pre-determined BMP effectiveness rates. Selection and review of modeling approaches may occur by: 1) identifying methods that fit the intended uses, users, and evaluation criteria; 2) adaptation to local conditions; 3) technical review; and 4) formal approval. Trading programs should use existing review and selection processes where applicable. For example, models are often developed as part of a TMDL or a comparable process.

1. *Identify relevant methods*: at the most basic level, a model needs to deliver outputs in useful units. For water quality trading, this means model outputs should be expressed or convertible to the same units as the regulatory water quality standard, or its surrogate targets. These units are typically expressed as concentrations or load (e.g., lbs), on a timescale that is monthly or finer (e.g., seasonal outputs that can correspond with seasonal load limits), though annual averages may also be appropriate. A model also needs to operate at an appropriate geographic scale and resolution: models for estimating field-scale pollutant reductions and those for delivering pollutants from the field to the waterbody will typically need to work for a 1–3 acre field up to a 300–3,000 acre field. Attenuation models should be applicable to the size of the area that needs to be evaluated—this may be a stream reach (i.e., "reach-scale") or a Watershed (i.e., "Watershed- scale")—and should accommodate multiple inputs and outputs to better reflect cumulative patterns and loading processes.

   It may be difficult to find the perfect model that meets all of these criteria and the criteria for all Quantification Methods (accurate, sensitive, repeatible, transparent, and practical). Depending on the program's objectives, trading program administrators will usually have to make some tradeoffs in selecting and adapting models. For example, models that are more complex may more accurately represent the dynamics driving water quality changes, but that complexity may also make them harder to use and therefore less transparent.

2. *Adapt to local conditions (Calibrate)*: model parameters should be adjusted to better match local conditions. Ideally, calibration occurs using measured water quality data from various locations in the Watershed, including a representative set of project sites. Calibration may also require the development and integration of standard datasets for the local area (e.g., soils, climate, and crop management), or alteration of the coefficents for certain model parameters based on expert judgement.

3. *Technical review (Validate):* model outputs or other methods should be confirmed as meeting evaluation criteria (accurate, repeatible, sensitive, transparent). Often, Validation includes comparison of model results with measured data, sensitivity analyses, and uncertainty analyses. Validation may also include a comparision with other model outputs, literature values, and/or expert judgement. Where measured data is not available to validate accuracy, adapative management and monitoring to improve the model over the time are particularly important—*see* Section 11 (discussing adapative management). An analysis of uncertainty in model estimates provides important information when validating accuracy. Modeling uncertainty should be accounted for in Credit quantification or as a Trading Ratio (which are discussed in Section 4.1).

   Model Validation may be an internal process or may be conducted by an independent entity. In either case, results of the technical review should be made publicly available and incorporated into technical documentation as possible (i.e., publishing of results in peer-reviewed scientific literature).

4. *Formal Approval*: if deemed necessary, approval might come in the form of inclusion of the tool within state guidance, an approval letter from the state water quality agency, or approval to use the tool within a particular permit.

C. Direct measurement

Where direct measurement is employed, 1) instrumentation needs to be objectively verifiable—a Verifier can confirm that the instrument is appropriate for the purpose, installed and calibrated correctly, and producing adequate results; 2) records need to be kept for each sample taken, including date, time, method of data collection, and results; and 3) state agencies would need to perform a technical review and formally approve the monitoring/sampling plan or quality control report.

Direct measurement has a very important role to play in terms of Effectiveness Monitoring and as a basis for Adaptive Management, but may not be the best approach for initial quantification in many cases. If Direct Monitoring is used at even a few project sites, the data gathered should be used to improve modeled results over time (i.e., creation of feedback loop).

3.3 Quantifying conditions at the field-scale

Draft Recommendation – Field-scale quantification*: Each trading program should identify one or more standardized method(s) to quantify the pollution reductions for BMPs at the field-scale. Where possible, these methods should synchronize with the reach and/or Watershed models used in the TMDL so as to enable tracking of progress toward TMDL goals.*

Commentary: There are a number of field-scale Quantification Methods that may support trading in the Pacific Northwest. The following list includes some field-scale Quantification

Methods that might be applicable for particular Watersheds or pollutants, but is not an exhaustive list:

1. *Nutrients:* Hydrologic characterization tool (developed by University of Idaho); Agricultural Policy Extender (APEX); Nutrient Tracking Tool; BMP efficiency rates (e.g., those explored for Spokane); Spreadsheet Tool for the Estimating Pollutant Load (STEP-L).
2. *Sediments*: Surface Irrigation Soil Loss (SISL) model; Hydrologic characterization tool (developed by University of Idaho); STEP-L ; streambank erosion inventory (Idaho); Revised Universal Soil Loss Equation (RUSLE).
3. *Temperature*: Heat Source modules and extensions—Shade-a-lator (OR, ID); Shade (WA, similar to Shade-a-lator); QUAL-2K; CE-QUAL-W2; HEC-RAS; Potential Natural Vegetation (PNV) shade analysis; W3T to quantify temperature benefits of in-stream flow (in development by National Fish and Wildlife Foundation).

3.4 Project site assessment

This section discusses how to develop and document the information necessary to input into the Quantification Methods (specifically pre-determined rates and models) discussed above, including the data and documentation necessary to establish pre-project conditions on a Credit project site, and the anticipated post-project Site Conditions that will generate Water Quality Benefits.

3.4.1 Pre-Project Site Conditions assessment

To quantify Credits, a Project Developer needs to understand a project site's conditions and operations within the recent past. This allows the developer to establish the "Pre-Project Site Conditions." This information is used to show that project activities meet eligibility and Baseline requirements, and act as inputs when modeling the "Pre-Project Site Performance" as part of the Credit calculation process. For example, if a multi-year crop rotation is employed at a potential project site, the Project Developer may need to look back over the last 3 – 5 years to obtain a comprehensive understanding of what practices have previously and are currently occurring at the site.

Trading Guidance and programs should also consider how best to ensure that information about the Pre-Project Site Conditions is accurate. One approach is to require that Project Developers attest that the information is accurate; another is to require the use of specific monitoring techniques for a given type of information (e.g., document existing vegetation with photo points).

Draft Recommendation – Pre-project Site Conditions assessment*: Pre-project Site Conditions for calculating edge-of-field Water Quality Benefits are established based on site condition in the program's "Base Year," prior to implementation of practices that will generate Credits*

and/or practices that will meet Baseline requirements. Pre-Project Site Conditions may be assessed during a site visit by a Verification entity, but this may be costly and not necessary. Whether a pre-project site visit is conducted by a Verification Entity or not, a Project Developer should document Pre-Project Site Conditions using state-approved guidelines, where they exist, for each eligible BMP. For structural BMPs, "Photo Point Monitoring" should be included to document Pre-Project Site Conditions. Project Developers should collect this documentation and attest that the information is complete and accurate. During Verification, this documentation may be reviewed for completeness. For more complex projects, additional documentation of Pre-Project Conditions may be required.

***Draft Recommendation – Documenting Pre-Project Conditions**: At the outset, the content, consistency, and quality of information that landowners have available is likely to vary widely. Thus, in the first 1 – 2 years of a Trading Framework or Plan, some flexibility as to the rigor of required documentation may be appropriate because it may take time to establish and disseminate program expectations for documentation of current and recent operations.*

Commentary: The information required to document pre-project Site Conditions will vary depending on both the BMPs being proposed for Credits and the type of pollutant Credit being targeted. Some samples of information and documentation that may be required for specific BMPs are shown in Table 3.4.1 below.

There is a tradeoff between program costs and the level of confidence in documentation of pre-project Site Conditions, and the ability to independently verify those conditions. Comprehensive documentation of Site Conditions will typically improve confidence in the pre-project Site Performance from which Water Quality Benefit calculations are developed and may simplify Verification. In many cases, documentation is straightforward to obtain. In other cases, comprehensive documentation can be more complex to gather, and could thus create significant transaction costs to Project Developers and ultimately to Credit Buyers.

Table 3.4.1. Example documentation for assessment of project Site Conditions.

BMP	Information/Documentation Required
Nutrient management for nutrient Credit	The Ohio River program requires three years of farm practice history, including fertilizer application quantities and rate/acre,

	fertilizer brand and mixture, and other information required to quantify nutrient delivery to the edge-of-field.[80]
Riparian forest restoration for temperature Credit	Current canopy cover, buffer width, aspect, stem density, species composition, invasive cover, channel characteristics (e.g., wetted width), and other required information. A map with location and extent of BMPs.[81]
Cover crop or crop rotation for nutrient Credits	Previous crop rotations documented through available geospatial data or landowner records, and other required information. A map with location and extent of BMPs.
Change in irrigation for nutrient Credits	Last three years of irrigation type, sources of irrigation water (e.g., water diversions, groundwater wells), application rate, documentation of application, and other required information. A map with location and extent of BMPs.

3.4.2 Open enrollment

In some cases, the trading "Base Year" (discussed in Section 2.1.2) may be linked to the date prior to the development of a trading program (e.g., the Base Year is 2008 when the TMDL was issued, and the trading program is approved in 2013). Those Project Developers seeking Credit for projects completed after the Base Year but prior to the approval of a Trading Framework or a Trading Plan should demonstrate conformity with all trading program requirements later identified (e.g., Baseline requirements, BMP quality standards, documentation of pre-project Site Conditions, etc.). An "open enrollment" period provides an opportunity to involve early actors that may have already implemented positive practices, but do not yet have the documentation necessary to sell Credits. This mechanism allows a trading program to avoid penalizing and thereby inhibiting early action to restore water quality. On the other hand, there are risks in crediting projects implemented prior to Trading Guidance, Framework or Plan approval. Moreover, projects that would have been implemented in the absence of trading may not go beyond "Business As Usual," and therefore may not be additional. Also, even if all projects must meet Trading Guidance, Framework, or Plan requirements, there may be some

[80] Electric Power Research Institute, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Program, at 4 (2012), *available at* http://wqt.epri.com/overview.html.

[81] Willamette Partnership, Draft General Crediting Protocol Addendum: Riparian Planting Standards (Sept. 2011), *available at* http://willamettepartnership.org/tools-templates/Draft%20Addendum%20Riparian%20Planting_2011.pdf.

expectations from landowners or Project Developers about possible Credits that do not materialize.

Draft Recommendation – Open enrollment*: If open enrollment is deemed appropriate in Trading Guidance, a Trading Framework or in a Trading Plan, landowners should provide sufficient documentation of pre-project Site Conditions to create valid inputs into Credit calculations. Regulators may provide an "Open Enrollment" period during which early-adopter landowners who installed conservation practices during the appropriate look-back period, but do not yet have sufficient data to qualify for new trading program or Trading Solution eligibility standards, can enroll their Credits in the program, pending compilation of appropriate documentation during a probationary period.*

Commentary: In some instances, landowners may have undertaken environmentally beneficial practices that would otherwise qualify under more recently adopted Trading Guidance, a Trading Framework, or the parameters of a specific Trading Solution. However, these landowners may not currently possess sufficient information to prove their eligibility. In an effort to allow these landowners to participate in trading, their actions may be eligible to sell as Credits during an Open Enrollment Period. Enrollees would then have a probationary period during which to collect the appropriate documentation, or else their enrollment would lapse. In addition, even if the enrollee successfully gathers the necessary information, the installed BMPs would still need to reduce pollutants during the Critical Period and years identified in a permit in order to qualify for sale.

3.4.3 Initial estimate of Post-Project Site Conditions

To complete a Water Quality Benefit calculation, Project Developers will also need to measure or estimate Post-Project Site Conditions after a BMP is installed. Where a modeling approach is used to quantify Credits, the anticipated Post-Project Site Conditions are then used as the basis to model anticipated Post-Project Site Performance (i.e., the amount of Credits generated from the site), and are therefore particularly important.

For BMPs that become fully effective upon the completion of installation (e.g., nutrient management), the Post-Project Site Condition is simply the presence or absence of that BMP at a site, provided that it is constructed to required standards and is placed at the correct location. For BMPs that take longer to mature (e.g., wetlands to reduce nutrients, or riparian reforestation), Project Developers may need to forecast anticipated Post-Project Site Conditions in order to calculate the final anticipated Post-Project Site Performance and estimate the full anticipated Water Quality Benefit.

Draft Recommendation – Estimating Post-Project Conditions*: For each eligible BMP, regulators should identify the characteristics required to be present in the Post-Project Site Condition. This condition should be used to calculate the total anticipated Water Quality Benefit from a site. For*

BMPs that become fully effective upon the completion of installation, the Post-Project Site Condition is simply the presence or absence of that BMP at a site, provided that it is constructed to required standards and is placed at the correct location. For BMPs that take longer to mature, Project Developers need to clearly document the assumptions about the anticipated Post-Project Conditions that are built into anticipated Post-Project Site Performance estimates. The modeling assumptions used to translate Post-Project Conditions into a Post-Project Site Performance should be documented in a way that can be independently verified. State Trading Guidance or rules, a Watershed Trading Framework and/or an individual permit Trading Plan may provide direction on allowable modeling assumptions. States may choose to review these documented estimates of anticipated Post-Project Performance on a case-by-case basis.

Commentary: For some BMPs, forecasting Post-Project Site Conditions is straightforward. For example, consider a scenario in which the Pre-Project Site Condition is a corn field with no grassed filter strip and a Project Developer intends to install a 25-foot wide grassed filter strip in the required location and reduce application of fertilizer by one-third, which will be immediately installed and effective. The Post-Project Site Condition therefore includes all the implemented BMPs.

For BMPs that take longer to mature, forecasting the final anticipated Post-Project Conditions may be more challenging. For example, forecasting the benefit of animal exclusion to reduce stream bank erosion would involve estimating the rate at which banks regenerate and stabilize. For BMPs that take time to mature and provide their full functional value, agencies should determine whether the Post-Project Site Condition will be used to determine the number of Credits released upon Verification or if Credits are released in phases (See Section 5.1 Credit Life for a deeper discussion on the timing of Credit release for BMPs that take time to mature).

These actual and/or anticipated Post-Project Site Conditions are used as the basis to model Post-Project Site Performance (i.e., the amount of Water Quality Benefit generated from the site). For either of these scenarios, Trading Guidance, Trading Frameworks and/or Trading Solutions/Plans should provide direction to Project Developers as to how to estimate and verify Post-Project Site Conditions and Post-Project Performance.

DRAFT

4. Adjustments to Water Quality Benefits

In this section:

- How should delivery and Attenuation be accounted for?
- How should Trading Ratios be documented?
- Should there be a minimum ratio?
- Which factors go into a Trading Ratio?
- When is a reserve of Credits appropriate?

This section discusses various adjustments that may be made to edge-of-field Water Quality Benefits, particularly those that account for delivery to and Attenuation in the waterbody (quantification side), and those that account for risk and uncertainty. In many cases, after the edge-of-field Water Quality Benefits have been quantified, additional calculations are then used to estimate how much of the pollutant is transported from the point at which it is generated into the waterbody and to the point of concern downstream. The physical and biological processes by which pollutant load is reduced as it travels between two points is known as "Attenuation." The ways in which Water Quality Benefit can be impacted by Attenuation are discussed in Section 4.1.

Water Quality Benefit can also be adjusted by applying a number of risk and uncertainty management adjustments, including application of Trading Ratio, Reserve Pool, or other factors to determine the amount of Water Quality Benefit available to be sold as Credits.

Thus, the number of Credits that can be sold is equal to:

*Credits Available to Sell = Water Quality Benefit (edge-of field) – Attenuation – Trading Ratios/Reserve Pool**

*Note: Baseline may be accounted for in calculating Water Quality Benefit. It may also be accounted for at this point.

4.1 Delivery and Attenuation of Water Quality Benefits

Attenuation of pollutants can occur as runoff travels overland and is delivered into the waterbody, and as it is transported instream. Following are quick descriptions of these types of Attenuation:

- **Delivery from the field to the waterbody:** In some cases, it is necessary to understand how much of the pollutant load is delivered from the field into the waterbody (e.g., where a BMP is installed in a location that is separated from the nearest ditch or stream by another field or land cover type). Where a trading

program includes these scenarios, it may use a Quantification Method that can estimate the dynamics of run-off across multiple land cover types.

- **Delivery to a downstream point of concern (i.e. "instream Attenuation"):** Instream Attenuation of pollutants accounts for the change in pollutant quantity as it moves from a point upstream to a point downstream, such as from the location of an installed BMP to the point of concern in a TMDL, or point of compliance for the permittee. Watershed-scale or instream models can quantify instream Attenuation. In some cases, instream Attenuation is estimated on a project-by-project basis. In other cases, standard ratios are developed (based on measured data or model simulations) to describe Attenuation from various portions of the Watershed to the point of concern.

Accounting for delivery into the waterbody and instream Attenuation may not be necessary for every program or every trade. For example, where fields are directly adjacent to a stream, 100% delivery to a water body (or some other ratio) might be assumed rather than using a field-to-waterbody model. Utilizing multiple Quantification Methods increases the technical burden on those reviewing and approving Quantification Methods, as well as on those applying them to calculate Water Quality Benefit. Trading programs should balance these practical considerations with the extent to which each component of the Water Quality Benefit calculation impacts overall accuracy.

4.1.1 Delivering pollutants from the edge-of-field into the waterbody

Not all Nonpoint Source land is directly adjacent to a stream, and not all pollutants will transfer from the edge of a field into the nearest waterbody. Some trading programs and guidance have assumed that 100% of pollutants leaving the edge of a field adjacent to stream reach the water column. Other trading programs have used delivery ratios to determine the percentage of pollutant that reaches a waterbody. A growing number of programs are now using models to quantify the delivery of pollutants from the field into a waterbody.[82]

***Draft Recommendation – Accounting for pollutant delivery to the waterbody**: When calculating Water Quality Benefit for trades, a calibrated and validated method or an approved delivery factor based in science is preferable, but a transparent surrogate for field-to-waterbody delivery such as location alongside a stream or other permanent water body may be considered. It may not be necessary to account for delivery to the waterbody for irrigation system BMPs*

[82] *See* EPRI, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Project, App. E-4, § 4.B (2009), *available at* http://wqt.epri.com/pdf/ORB%20Trading%20Plan%208-1-12%20final.pdf (Section 8 on Credit Calculation Methodologies).

where the hydrologic connection between the discharge water and receiving water body is direct or nearly so. However, for practices where the receiving waterbody is not immediately connected hydrologically to the field, a field-to-waterbody delivery factor may be necessary.

Commentary: Accounting for the movement of pollutants from the point of generation into the waterbody is also sometimes discussed in the context of Trading Ratios.[83] The use of Trading Ratios is discussed in Section 4.2.

4.1.2 Attenuating pollutants downstream

Instream Attenuation is almost always based on models, often the same models that were used to develop the TMDL in a Watershed. In some cases—either where there is no TMDL yet or where a TMDL is not sensitive enough to attenuate load reductions from a smaller Nonpoint Source—other models may need to be used.

***Draft Recommendation – Accounting for pollutant Attenuation**: Where the TMDL model is sensitive enough to model the Attenuation of pollutants through a reach or Watershed between a Credit-generating BMP and a Point Source Credit user, those models should be used. If a TMDL or Watershed model is not available or not applicable, another model should be selected based on appropriate model selection criteria. These models should be calibrated to the best available data, and should undergo technical review and state-agency approval processes.*

Commentary: Attenuation is often included in the TMDL models (e.g., the Chesapeake Bay Watershed Model),[84] and reflected in the Credit calculations themselves (e.g., Nutrient Net as applied in the Chesapeake).[85] Attenuation may also be accounted for through a Trading Ratio, as suggested by the U.S. EPA Trading Toolkit.[86] The use of Trading Ratios is discussed in Section 4.1.

Incorporating Attenuation through the Watershed, through modeling or ratios, usually incentivizes action closer to the point of discharge, which may not always be appropriate or

---

[83] *See* U.S. EPA, Water Quality Trading Toolkit for Permit Writers, at 30-31 (2009), *available at* http://www.epa.gov/npdes/pubs/wqtradingtoolkit_fundamentals.pdf.

[84] U.S. EPA, Chesapeake Bay Program Office, Chesapeake Bay Phase 5.3 Community Watershed Model, EPA 903S10002 - CBP/TRS-303-10 (2010), *available at* http://www.chesapeakebay.net/about/programs/modeling/53.

[85] Branosky E, C. Jones and M. Selman, World Resources Institute, Comparison Tables of State Nutrient Trading Programs in the Chesapeake Bay Watershed: WRI Fact Sheet, at 10 (2011), *available at* http://www.wri.org/publication/comparison-tables-of-state-chesapeake-bay-nutrient-trading-programs.

[86] *See* U.S. EPA, Trading Toolkit, at 30-31 (2009).

consistent with protecting beneficial uses. For example, Idaho's Lower Boise River program defined the mouth of the river near Parma, Idaho as the point of concern in a TMDL[87] because the highest value nutrient reductions came from irrigation canals downstream from Point Source dischargers but upstream from Parma. The Lower Boise program used Attenuation ratios that gave more Credit for reductions generated closer to Parma, even if they were downstream of the Buyer, to more accurately reflect the benefit of those reductions. Below is a pollutant-specific, but not exhaustive, list of some of the tools in use and/or available for use in trading in the region that can be applied to understand pollutant Attenuation:

1. *Nutrients*: QUAL2K, QUAL2Kw, CE-QUAL-W2 and flow duration curves have been used in many nutrient TMDLs. Their ability to attenuate nutrients for trades is unclear. Other Watershed models used or considered for quantifying nutrient dynamics in trading include: Watershed Analysis Risk management Framework (WARMF), Better Assessment Science Integrating point & Nonpoint Sources (BASINS), and Soil and Water Assessment Tool (SWAT).

2. *Sediment:* Sediment mobilisation and transport can be quantified using BASINS, Spatially Referenced Regressions On Watershed attributes (SPARROW), Watershed Erosion Predition Project (WEPP), and SWAT model suite.

3. *Temperature*: Thermal load can be quantified using Heat Source, HEC-RAS, CE-QUAL-W2, and Water Temperature Transaction Tool (W3T) to quantify temperature benefits of in-stream flow for small reaches (in development by National Fish and Wildlife Foundation).

This section describes two fundamental risk management components for a trading program: Trading Ratios and Reserve Pools.

4.2 Developing Trading Ratios

A Trading Ratio is a value that is multiplied by the number of Credits that would otherwise be generated. Ratios are applied to account for various factors, such as Watershed processes (e.g., Attenuation), risk, and uncertainty (in terms of measurement error and project performance,

[87] Idaho Dep't of Environmental Quality and Ross & Associates Environmental Consulting, Ltd., Lower Boise River Effluent Trading Demonstration Project: Summary of Participant Recommendations for a Trading Framework, at 12 (2000), *available at* http://www.deq.idaho.gov/water-quality/surface-water/pollutant-trading.aspx.

ensuring net environmental benefit, and/or ensuring equivalency across types of pollutants). Ratios are applied to the final calculated Credit amount.

***Draft Recommendation – Development of Trading Ratios**: Ratios should be based in science when trying to achieve scientific objectives. Where specific policy objectives, including Watershed goals, economic feasibility, and appropriate levels of risk or uncertainty need to be considered, they should be included in Trading Ratio decisions. The assumptions underlying the chosen ratio should be carefully documented in a transparent manner in the regulatory documents (Trading Ratios may be set at the state, Watershed, or individual permit level). Where ratios are set for individual trades, their development should follow a consistent approach. Where Trading Ratios contain multiple components, they may be applied separately or combined into a single factor. In either case, the technical or narrative reasoning behind treatment of delivery/location, equivalency, uncertainty, and retirement should be clearly documented.*

4.2.1 Minimum Trading Ratio

***Draft Recommendation – Minimum Trading Ratio**: In combination, the various ratios applied to a Point Source's Credit obligation (i.e., delivery/location, equivalency, uncertainty, retirement) should always be greater than 1:1 (e.g., for every unit of pollution discharged by a Point Source, there must be more than one unit reduced through trading). As a default, trading programs should consider including at least a small retirement ratio to generate net environmental benefit.*

Commentary: Trading Ratios should never be less than 1:1, unless compelling reasons exist.[88] In combination, setting ratios too high reduces potential cost savings for Point Sources (because they have to purchase more Credits), but setting ratios too low may not adequately account for risks to the environment.

4.2.2 Specific Types of Ratios

This recommendation (and commentary) draws heavily from U.S. EPA's Trading Toolkit, which defines ratios for uncertainty or reserve and retirement (this section of the Trading Toolkit also provides detail on delivery or location, and equivalency ratios, although these are discussed separately in Section 3 of the best recommendations). The following definitions of ratio types are adapted from the Trading Toolkit and Willamette Partnership's *In It Together.* Ratios will likely vary depending on the target pollutant, and the types of uncertainties associated with

[88] Recognizing the importance of this point, Wisconsin codified this concept. *See* Wisc. Stat. s 283.84(1)(m).

trading the pollutant. The risk and uncertainty represented in each of these categories can be accounted for as ratios or through other program components (e.g., margin of safety and conservativeness in Credit calculations, or through delivery/location and/or equivalency factors in modeling, instead of through the application of an uncertainty ratio). The recommendation above suggests documenting consideration of each of these types of ratios, whether they are incorporated into a final ratio or elsewhere in the process. That documentation can be based on sophisticated analysis and modeling or based on a narrative description that documents the reasoning behind selection of a certain ratio value.

a. Delivery or location ratios

Delivery ratios account for the Attenuation of pollution from one point in a stream down to another. Accounting for pollutant delivery or location is sometimes discussed in the context of Trading Ratios.[89] However, because accounting for location relies heavily on quantification of Attenuation within the waterbody, it is discussed in Section 4.1 of this Draft Recommendations document.

b. Equivalency ratios

Equivalency ratios adjust for trading of different species of the same pollutant.[90] For example, some forms of nitrogen or phosphorus are more biologically available than others, meaning that they can readily be utilized by algae and lead to algal blooms, impacting the system more severely. Equivalency ratios can also be used to account for A) the variation in the availability of the different species of the same pollutant within a system, or B) cross-pollutant trades. For example, where nutrient loading causes algal growth or low DO concentration and the system is phosphorus-limited, reducing a pound of phosphorus on farms might equal ten pounds of nitrogen discharged from a wastewater facility.

Equivalency between different species of the same pollutant can also be addressed as part of the Quantification Method. In this case, a mathematical model or conversion factor would be used to adjust Water Quality Benefit from one species of pollutant into another. Incorporating equivalency in Quantification Methods is also discussed in Section 3.

c. Uncertainty ratios

[89] *See* EPA, Trading Toolkit, at 30-31 (2009).

[90] See id.

Uncertainty ratios help account for measurement and implementation uncertainty. Better science, better understood BMP outcomes, experience with trading, and clearer understandings of risk can reduce the need for a large uncertainty or reserve ratio. Measurement uncertainty accounts for errors in Credit calculation methods. Implementation uncertainty buffers against potential project failure, both from the failure of best management practices (BMPs) to perform as anticipated, and from unanticipated events such as a flooding or fires. Sometimes, different BMPs may have different uncertainty ratios.[91] If a trading program is already accounting for uncertainty in other places (e.g., through margins of safety in TMDL assumptions or via conservative model assumptions), uncertainty ratios may not need to be as large, or may not be necessary.

d. Reserve ratios

In some programs, a portion of Credits is held in "reserve" to account for potential BMP failures. For example, the Ohio River program requires that all projects reserve 10% of all Credits sold to account for uncertainty and project failures.[92] If a trading program is already accounting for potential risk of loss in other places, reserve ratios may not need to be as large, or may not be necessary.

e. Retirement ratios

Some Trading Guidance, Frameworks or Plans may require the permanent removal of some Credit amount from what is available for sale. The use of the term in various trading contexts shows it has at least two distinct purposes. If more than one purpose is to be used in a single trading program or plan, each should be calculated and labeled separately and then recombined:

1. *To ensure that the trading program generates a net water quality improvement*. For example, a ratio can ensure that for every pound of sediment discharged into a stream, at least 2 – 4 pounds of sediment are removed, and "retired" for environmental benefit; and
2. *To fulfill Baseline requirements at an individual Nonpoint Source landowner site*. This approach effectively retires a portion of the Credit generated from a landowner's site in

[91] Wisconsin Department of Natural Resources, A Water Quality Trading How To Manual, at Appendix A. Uncertainty Ratios (2013); *available at* http://dnr.wi.gov/topic/surfacewater/waterqualitytrading.html.

[92] Electric Power Research Institute, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Program, at 4 (2012), *available at* http://wqt.epri.com/overview.html.

order to account for the requirements of pre-existing laws and regulations or reduction requirements derived from a TMDL or other state non-Point Source requirements. It is not necessary if Baseline requirements are built into the inputs for quantifying Water Quality Benefits described in Section 3.

Some programs may choose to assign a lower retirement ratio to incentivize BMPs that have multiple benefits, or are ecologically preferred. For example, a BMP may create phosphorous Credits, but if it can also control Toxics, temperature, and provide wildlife habitat, there may be justification to provide a lower retirement ratio. This is often a policy decision, but needs to be documented with an appropriate justification.

f. Other ratios:

In unique circumstances, Trading Guidance, Watershed Frameworks or individual Trading Plans may choose to define ratios to cover other factors. One such factor might be the accounting for any temporal loss from Credits awarded to BMPs that take time to mature. For example, riparian forests may take 10+ years to provide the shade they are given Credit for when they are planted and Verified. There are several ways to account for this time lag; some Trading Guidance, Frameworks, or Plans may choose to apply a Trading Ratio[93] (See Section 5.1.2. for other options on dealing with time lags in BMP maturity).

4.2.3 Documenting Trading Ratios

Draft Recommendation – Documenting Ratios*: The different types of ratios discussed above can be merged together in a single ratio, or kept separate. Regardless of whether ratios are broken apart or combined, there should be clear documentation of how each factor was considered and included/not included in the permit, trading program, and/or state guidance.*

Commentary: A single Trading Ratio applied across the state or the Watershed or Trading Area works well where pollution reductions anywhere in the Watershed will have similar benefits to the overall water quality standards and other goals. This approach is straightforward and provides a high level of predictability for Buyers and sellers. However, combined ratios reduce a program's ability to account for site-specific factors and variation in Delivery/Attenuation (unless these factors are included in quantifying Water Quality Benefit). Keeping ratio components separate and applying them individually to each project may provide incentives to install BMPs in the closest, most effective, and/or lowest risk locations. The tradeoff is that this approach creates an extra step for the Project Developer to determine the quantity of Credits that will be generated from a given project and complicates analyses of available Credit supply

[93] *See, e.g.,* Oregon DEQ, Water Quality Trading in NPDES Permits IMD, Appendix A, A-6 (2012).

within a Watershed. To counteract this outcome, some trading programs have built models and software to ease this analysis. For example, the Ohio River Basin has generated delivery factors using the WARMF model and they are displayed to the Buyer through the Registry interface.[94]

4.3 Reserve Pool

Several recent trading programs have established a Reserve Pool of Credits to programmatically manage the risks stemming from uncertainty and project failure. Some programs still allow purchasers to self-insure, or do not explicitly address the issue. Typically, a Reserve Pool is built by applying a reserve ratio to each Credit-generating project. It may also be possible to populate a Reserve Pool through private or public investment in reserve projects. These Credits are then placed in a reserve managed by a trading program administrator (e.g., a state agency or its designee). The Reserve Pool manager would control access to the pool based on rules set forth in state guidance or the trading program.

***Draft Recommendation – Use of Reserve Pool**: Trading Guidance and/or Trading Frameworks may provide a Reserve Pool option, but not require its use. If a Reserve Pool is used, the Trading Guidance or program needs to define its manager, how it will be populated over time, the circumstances under which a Point Source may access Credits, the rules regarding when Credits should be permanently purchased versus temporarily loaned, and a mechanism for dealing with the accumulation of Credit surpluses.*

Commentary: The 2003 U.S. EPA Trading Policy states that "[w]here appropriate, states and tribes may elect to establish a Reserve Pool of Credits that would be available to compensate for unanticipated shortfalls in the quantity of Credits that are actually generated."[95] In water quality trading programs in the Northwest, Reserve Pools have garnered less interest than anticipated.[96] As such, this draft recommendation merely highlights the various considerations to account for if and when implementing a Reserve Pool. The biggest advantage of a reserve is that it provides a mechanism for pooling and addressing risk of project performance across an

---

[94] Electric Power Research Institute. Credit Registry. WQT.EPRI.com. Retrieved October 2, 2013, from http://wqt.epri.com/Credit-Registry.html. The Ohio River Basin trading program considers the delivery factor to be part of Credit quantification, as opposed to a Trading Ratio. *See* EPRI, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Program, at 4.

[95] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

[96] The interagency Counting on the Environment working group predicted that the Reserve Pool concept would be widely used, but thus far (Willamette Partnership, General Crediting Protocol Version 1.1). Thus far, however, Reserve Pools have not been used in the Northwest.

entire program. Reserve Pools make the most sense in Trading Areas where several Point Sources are participating in a trading program. Not all trading programs use a reserve, however. In some trading programs, NPDES permit holders are individually responsible for remedying any project failure that affects the Credits they hold for permit compliance. As such, these entities would rather "self-insure" either by 1) developing extra Credit generating projects, or 2) maintaining contingency funds or insurance. The self-insurance approach is most attractive in Trading Areas with a small number of participating Point Sources, and thus few options for pooling risk.

DRAFT

5. Credit Characteristics

In this section:

- When do Credits begin and end?
- Can a project be renewed?
- Are Credits property rights?
- How are Credits treated from a financial perspective?
- Can public conservation funding generate Credits?
- Can multiple Credits be sold from the same BMP?

Trading programs define the essential characteristics of a Credit, including standards that identify when a Credit is created, when it expires, how it is treated from an accounting standpoint, and whether multiple Credits from the same action can be used for compliance with other obligations (e.g., Stacking). Several terms describing different time periods important to trading and Credit characteristics are used throughout this section:

- **Credit Life**: the period from the date a Credit becomes usable as an offset by a permittee (i.e., its "effective" date), and the date that the Credit is no longer valid (i.e., its "expiration" date).
- **Project Life:** the period of time over which a given BMP project is anticipated to generate Credits. Typically, the Project Life is also the minimum Project Protection Period.
- **Project Protection Agreement**: the enforceable agreements to protect BMPs at the project site, which may include leases, contracts, easements, or other agreements. This agreement should run with the land to ensure the project will not be affected if ownership changes.
- **Project Protection Period**: the duration of the Project Protection Agreement, which must cover, at a minimum, the Credit Life.
- **Credit Contract Period:** the duration of a contract between a regulated entity and a Project Developer/Landowner.

5.1 Credit Life

A Credit's "life" spans the period between when a Credit becomes usable as an offset by a permittee (i.e., its "effective" date), and when that Credit is no longer valid (i.e., its "expiration" date). The Credit Life may differ from the Project Life or the duration of the Project Protection Agreement with a landowner to generate the Credits via BMPs. For example, the Credit life of nutrient Credits from a grassed buffer will likely be one year or less (e.g., the Credit can only be used by the regulated entity to comply during a particular seasonal or monthly window), even if the landowner has entered a 5-year lease protecting project activities in the riparian area. In

this instance, so long as the site still has a Project Protection Agreement in place, during the next year, Credits generated from the site will have a new Credit Life that lasts until the end of the relevant period(s) in that particular year.

5.1.1 Determining Credit Life Span – tie to Critical Period

Commented [BC6]: REVIEWERS: We tried to really clean up this discussion.

Each year, the Credit Life may extend for only a particular period of time. Pollution reductions eligible to generate Credits (i.e., the timing of the Credit Life) for trading should address loading issues at the appropriate periods of time during a year.

***Draft Recommendation – Credit Life**: The Credit Life, or the time period over which pollution reductions are eligible to be used as Credits, should be tied to the Critical Periods identified in a TMDL, Watershed plan or Trading Framework, or in a permit. In some cases, that Critical Period is a year, a season, a month, or even a period of days.*

Commentary: The seasonal dynamics of pollution matter. If a stream has a summertime nutrient problem and BMPs reduce pollution in the spring, then there may not be a real offset to "trade." Tying Credit Life to critical time periods defined in the TMDL or similar analysis appears to be a straightforward approach. For example, temperature Credits may be calculated based on days or weeks of Exceedance. The permittee needs to have enough Credits in hand to cover those Critical Periods, even if BMPs (e.g., shade or instream flow) provide temperature benefits throughout the season or year.

Many trading programs use annual averages[97] (meaning that there is an annual Credit life). This is appropriate where analyses show that reductions in pollutant load from any point in the year are effective at improving water quality during the Critical Period (e.g., reductions in phosphorus loading at any point in the year contribute equally to improving dissolved oxygen during the Critical Period). Regardless of whether seasonal or annual averages are used, the regulatory body should ensure that BMPs installed to generate an annual Credit are providing the benefits needed at all times of the year when a permit Exceedance occurs.

In many cases, so long as the BMP continues to function, Credits can be renewed (*See* Section 5.1.4.).

[97] Branosky E, C. Jones and M. Selman, World Resources Institute, Comparison Tables of State Nutrient Trading Programs in the Chesapeake Bay Watershed: WRI Fact Sheet, at 8 tbl. 4 (2011), *available at* http://www.wri.org/publication/comparison-tables-of-state-chesapeake-bay-nutrient-trading-programs; Electric Power Research Institute, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Program, at 3 (2012), *available at* http://wqt.epri.com/overview.html.

5.1.2 When does a Credit become effective (i.e., when does the Credit Life start)?

Draft Recommendation – Effective date for Credit use*: In all cases, Credits should not be deemed effective prior to the period that defines the Credit Life. Credits should be deemed effective when a BMP is installed and Verified. In cases where specific BMPs help a Watershed move more quickly toward water quality standards and/or are identified as supportive of beneficial uses (e.g., riparian forest restoration for water temperature), Credits may be issued upon BMP installation and Verification, even if that BMP is not yet providing its full functional value provided there is appropriate accounting for any time lag (e.g., via Trading Ratios and/or reference to a Compliance Schedule in a permit). Issuing Credits prior to their full functional value has risks, which are discussed in the commentary below.*

Commentary: Many BMPs begin reducing water pollutant loading as soon as they are installed (e.g., cover crops, manure management, and flow augmentation). For these BMPs, there is general consensus that a Credit becomes effective as soon as the installed BMP is Verified as meeting its full functional performance, and in conjunction with the Credit Life.

Other BMPs, however, take time to mature and provide their full water quality improvements (e.g., riparian forest, grassed buffers, and animal exclusion for the purposes of reducing streambank erosion). Often, these BMPs not only provide the needed pollutant reductions, but are closely linked to providing ecological benefits supportive of Designated Uses in an impaired Watershed and may help to accelerate progress toward attaining water quality standards. Understanding the need to promote these types of restoration actions, regulators should consider designating these Credits as effective after Verifying that the BMP has been properly installed. If a state or program chooses to allow for Credit issuance upon Verification of a time-lagged BMP, it should be aware that there are greater potential risks associated with issuing Credits for BMPs prior to them providing their full Water Quality Benefits. First, there may be limited Water Quality Benefit when the BMP is initially installed, and a permittee will continue to discharges pollutants. Second, this action can undermine the notion that pollutants offset via trading Credits are being reduced at equivalent time, location, and quantities as would occur if the Point Source installed a technologial solution at its point of discharge. Third, there is risk that the BMPs will never perform as expected, increasing uncertainty for Point Source Buyers.

Yet, if the Credits generated from these practices are not deemed effective until they provide full functional value, purchasers will encounter several disincentives to investing in these types of BMPs. First, some time-lagged BMPs help to fundamentally improve the ecological processes that drive water quality (e.g., stream geomorphology, or wetland hydrology), and might also better address beneficial uses and be of higher priority in some Watersheds. Thus, early investment in these BMPs may accelerate the attainment of larger water quality improvements. Second, the purchaser will have to make a capital outlay upfront to fund the restoration activity, but will not be able to claim the Credits until a later date—this delay in investment realization is likely prohibitive for many Credit purchasers, especially where a purchaser is a

governmental entity answerable to ratepayers, and timeframes are short. Third, some permittees may need BMPs that help obtain compliance sooner than the time period required for the BMP to fully mature—this delay between the effective date of a Credit and required compliance milestones may expose permittees to potential liability for noncompliance unless a permit includes an appropriate Compliance Schedule.

5.1.3 When does a Credit expire (i.e., when does the Credit Life end)?

***Draft Recommendation – Expiration date for Credit use**:* At the end of the Credit Life, a Credit expires and cannot be used by the purchaser unless appropriately renewed.

Commentary: none

5.1.4 After the end of the Credit Life, can Credits be renewed?

Draft Recommendation – Project and Credit renewal: *After the end of the Credit Life, Credits can be renewed for subsequent periods so long as the BMP continues to function at a site, a stewardship plan is developed and funds are obtained to maintain the BMP and confirm project performance, and a new/renewed Project Protection Agreement is in place at a site.*

Commentary: Allowing for the renewal of Credits from ongoing BMPs may help to keep effective BMP practices in place for longer periods of time, and therefore further solidify the ecological gains achieved in the first Crediting cycle. When the Water Quality Benefit generated from a site is no longer Creditable, the Credit purchaser will no longer pay for continued monitoring/maintenance or landowner lease payments. However, many BMPs require ongoing investment and maintenance to sustain their water quality function (e.g., manure management, or riparian forest buffers). Landowners may also require ongoing incentives to maintain BMPs on the land or to provide access to those responsible for maintaining them. Without the ability to renew Credits from ongoing BMPs, there is no guarantee that their positive functions will continue to accrue. Another benefit to Credit renewal is that some BMPs are more effective the longer they remain installed.[98] A new BMP may not generate as much benefit for water quality as one that has been installed and maintained for enough time to allow for the full benefit of the BMPs to accrue. Finally, there are transaction costs associated with engaging new landowners and with the initial implementation of a BMP (e.g., development of a nutrient management plan, site preparation, Credit calculation costs). Maintenance of BMPs over time can make improvements to water quality more cost effective than continual investment in new BMP installations. Therefore, it may be important to renew some or all types of Credits in

[98] M.D. Tomer and M.A. Locke, The Challenge of Documenting Water Quality Benefits of Conservation Practices: A Review of USDA-ARS's Conservation Effects Assessment Project Watershed Studies, 64 Water Science and Technology 300, 300-310 (2011).

subsequent years. In Oregon, for example, the City of Medford's Credits are renewed every year for 20 years (because BMPs are regularly Verified and the City's Project Developer secures sites via 20-year Project Protection Agreements).

5.2 Are Credits property rights? Are Credits capital assets?

As trading is a new alternative form of compliance for many entities, it may be unclear how to treat Credits from an accounting standpoint. To clarify, Trading Guidance or trading programs can articulate: A) whether Credits are or are not property rights, and B) how to treat trading-related expenses and Credits for accounting purposes.

***Draft Recommendation – Credits are not property rights, but they may be thought of as capital assets**: Credits are not property rights. They can be issued, approved, and/or taken away by agencies. Yet, certified Credits are tradable goods with an ascertainable value. To the extent a Credit purchaser can add Credit assets to its capital asset ledger, as allowed under commonly accepted accounting principles and federal, state and local law, it increases their ability to: A) leverage capital asset funding mechanisms; and B) provide a mechanism to more easily fund ongoing maintenance and monitoring. It may also make sense for a state to define Credits as securities or non-securities.*

Commentary: If Credits are considered property rights (similar to land or water rights), a state agency may be significantly hindered in its ability to reduce the quantity of Credits over time, suspend Credits that are no longer valid, etc. Not all states have clarified their stance on the property nature of Effluent Limits or water quality trading Credits, but permits—which include Effluent Limits and enable Credits to be used for compliance—cannot convey a property right.[99] Analogously, California and Congress have respectively deemed carbon Credits and federal acid rain program allowances not to be property rights.[100]

States should also be cognizant that it is preferable for many Point Sources to treat Credits, or the underlying BMPs that generate them, as capital assets for the purposes of accounting, and

---

[99] *See, e.g.,* 40 C.F.R. § 122.41(g); Minn. R. 7001.0150 subpt. C(3) ("The permit does not convey a property right or an exclusive privilege."); Florida Dep't of Envtl. Quality, Water Quality Credit Trading: A Report to the Governor and Legislature, at 6 (2006), *available at* http://www.dep.state.fl.us/water/Watersheds/docs/WQ_CreditTradingReport_final_December2006.pdf ("[W]ater quality trading in Florida does not involve—and does not imply—the trading of pollution 'rights.'").

[100] Cal. Code Regs., tit. 17, § 95820(c) (stating that a compliance instrument "does not constitute property or a property right"); 42 U.S.C. § 7651b(f) (1990) (an emission allowance used in the Acid Rain Program "does not constitute property right").

acquiring debt to fund trading investments. Many Point Source Credit purchasers are government entities, and being able to capitalize Credit costs allows them the flexibility they may need to finance their purchase of Credits through bonds, state revolving fund (SRF) loans and other similar investment mechanisms that have traditionally viewed treatment technology as primarily a capital asset (whereas many trading-related investments require extensive ongoing monitoring and maintenance costs that may not be covered by SRF loans, and are therefore subject to the budgetary process and realities of local governing bodies). Moreover, treatment of Credits as capital assets allows Buyers to place those purchases on the asset side of a balance sheet, thus maintaining the entity's bond rating.

Lastly, states and/or trading programs may wish to obtain an interpretation of the nature of Credits—as securities or non-securities—from relevant federal and state trade bodies. This consideration is likely to become more relevant if and when more robust trading markets develop, and Credit speculation or secondary transactions become more robust.

5.3 Relation of water quality trading to other programs – Proportional Accounting, Credit Stacking & Payment Stacking

Commented [BC7]: REVIEWERS: This section may still need some discussion, but we tried to address comments.

When BMPs are installed, they may produce a number of ecosystem service benefits. With the emergence of a number of ecosystem service credit markets in the United States,[101] Trading Plans and Frameworks need to address the potential to sell and use multiple benefits from the same parcel of land ("Credit Stacking"), and the potential to use multiple sources of funding to generate credits ("Payment Stacking"). In order to avoid questions about Additionality, Plans and Frameworks need to be clear about where Credits are sold, how Credits are used, and how money is used to develop Credits. For the purposes of this document, the following terminology is used:

A) *Credit Stacking*: where more than one kind of Credit is generated and sold from the same action on the same area of land and at the same time.
B) *Payment Stacking:* the use of Public Dollars Dedicated to Conservation to help fund Credit-generating actions.
C) *Proportional Accounting*: where a site produces more than one distinct environmental benefit, but credits are deducted proportionally as other types of credits are sold from the same area and/or the money used to fund the project is accounted for separately.

[101] In the United States alone, there are already markets for wetland and stream credits, endangered species credits, water quality credits, and carbon credits. *See* Jessica Fox & Royal Gardner, The Legal Status of Environmental Credit Stacking, 40 Ecology L. Quarterly 101, 120 (2013).

D) *Public Dollars Dedicated to Conservation*: funds targeted to support voluntary natural resource protection and/or restoration, with a primary purpose of creating, restoring, enhancing, or preserving habitats. Some examples include Farm Bill Conservation Title cost share and easement programs, U.S. EPA 319 funds, U.S. Fish and Wildlife Service Partners for Wildlife Program, state wildlife grants, and other sources. Public loans intended to be used for capital improvements of public water systems (e.g., State Clean Water Revolving Funds and USDA Rural Development funds), utility stormwater and surface water management fees, and public funds raised from ratepayers are not Public Dollars Dedicated to Conservation.

The debate around Stacking in ecosystem markets is robust, and several sources have discussed Stacking in great detail.[102] Creating multiple credits from one project can complicate how a project demonstrates it is Additional—going above and beyond what is required or what would have happened anyway without trading. On one hand, there is concern that the same portion of the same project could be sold to more than one Buyer to offset different types of impacts. On the other, there is interest in encouraging projects to provide a range of ecological benefits. This section provides some ideas on how Trading Frameworks and Plans can deal with or simplify the issue of Stacking.

5.3.1 Accounting for Multiple Types of Credits and Funding Sources

Draft Recommendation* – Accounting for Multiple Credits and Funds: In order to avoid questions about Additionality, Plans and Frameworks need to provide clear and transparent guidance regarding how to track Credits and where different types of Credits are sold and used for compliance, and how to track which sources of funding are used to develop Credits.*

Commentary: Trading Plans and Frameworks can make it easier to demonstrate Additionality for projects with multiple benefits and funding sources if they provide clear guidance on how to track which types of Credits are coming from which parts of a project, and which funds are being used to fund different parts of a project. Proportional Accounting is one straightforward method to ensure a project's benefits are not sold more than once from a spatially overlapping area, and so are Additional. Proportional Accounting can be applied by percentage. For example, a 60-foot riparian buffer may produce both temperature and nutrient benefits at the

[102] *See, e.g.,* Jessica Fox & Royal Gardner, The Legal Status of Environmental Credit Stacking, 40 Ecology L. Quarterly 101 (2013); David Cooley & Lydia Olander, Stacking Ecosystem Service Payments: Risks and Solutions, 42 Evntl. L. Rep. News & Analysis 10150 (2012); Jessica Fox, Royal Gardner & Todd Maki, Stacking Opportunities and Risks in Environmental Credit Markets, 41 Environmental Law Reporter 10122 (2011), *available at* http://wqt.epri.com/pdf/credit-stacking-environmental-opportunities-and-risks.pdf.

same time. If a Project Developer wants to sell 20% of its temperature credits to one buyer, then it would deduct 20% of its nutrient Credits from that buffer, leaving 80% of either temperature or nutrient Credits available to sell to a second Buyer for a separate impact (*See* Figure 5.3.1). Alternatively, Proportional Accounting can be map-based. For example, if a 60-foot riparian buffer produces both temperature and nutrient benefits at the same time, a Project Developer can designate the first 50 feet of the buffer for temperature Credits, and the final 10 feet for nutrient Credits.

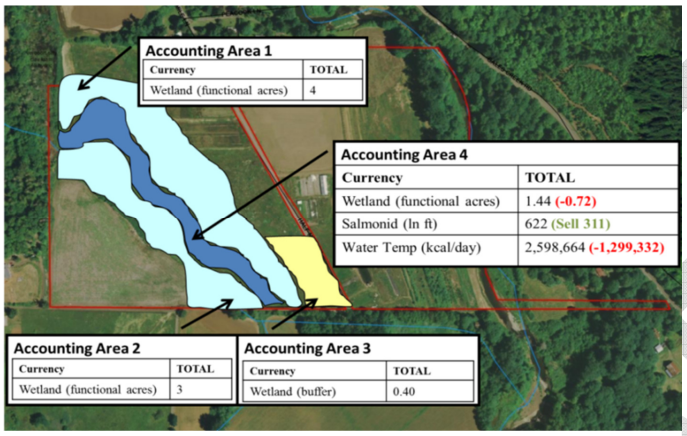


Figure 5.3.1. Linking credits generated from the same action

In addition to accounting for different Credit types within a Project Site, Trading Frameworks and Plans should also clearly account for the various sources of funds used to develop a Project Site.

5.3.2 Credit Stacking

***Draft Recommendation – Credit Stacking**: Stacking and selling credits generated from the same land area, at the same time, has been generally disfavored. As suggested by other regulatory frameworks,[103] opportunities for Stacking water quality trading credits may exist if credit Buyers and sellers demonstrate Additionality. One way Trading Plans or Frameworks can*

demonstrate Additionality is to use Proportional Credit Accounting.

Commentary: New Credit Quantification Methods make it easier to articulate water quality, habitat, carbon sequestration, and other simultaneous environmental benefits from BMPs. Nonetheless, the concept of selling or Stacking multiple Credits from the same area of land at the same time is controversial. This controversy stems from concerns about Additionality (i.e., is a seller profiting multiple times from one investment?), and from concerns that selling multiple Credits from one action may result in less restoration work being completed.

Arguments in favor of Stacking include:

- If an action generates multiple benefits, then a Project Developer should be able to sell multiple Credits—increasing the revenue potential for conservation and restoration projects, so they are more competitive with other land use choices such as agriculture or development. Stacking could allow Regulated Entities with multiple compliance requirements to design mitigation alternatives that have reinforcing environmental functions and values, as opposed to projects that maximize Credit outcomes instead of holistic restoration;
- If a Regulated Entity is faced with multiple compliance obligations, and it is able to invest in one piece of grey technology capable of addressing multiple issues, then it should be able to invest in one Trading Solution and reap the multiple ("bundled") environmental benefits derived from that site.

Arguments against Stacking include:

- Stacking may limit net environmental gain because Buyers are investing in less conservation overall;
- Stacking may create challenges for consistent accounting, especially if the different benefits derived from one site are "unbundled" and sold to different Buyers, or if the different Credits have a range of Credit Lives;
- Stacking may violate Additionality requirements. For example, if an action is already being taken to create Credit for one impact, one can argue that the benefit would have occurred anyway, and so is not creditable for other impacts.

To date, most programs have disallowed Credit Stacking. Some programs, such as North Carolina's Ecosystem Enhancement Program, did not initially explicitly preclude stacking but later reversed course (in that case, of nutrient and wetland credits). Originally, North Carolina wanted to capture and release Credits that reflected the multiple benefits of complex

restoration, but the backlash from a sale of stacked Credits prompted the state to disallow the practice.[104] Two Minnesota trading permits have explicitly prohibited Stacking,[105] whereas at least one water quality trading permit plan has explicitly endorsed Stacking.[106] In carbon trading—which faces similar questions related to Stacking—The Climate Action Reserve does not allow for Credit Stacking at this time, but does allow for the Proportional Accounting approach to Payment Stacking (described in Section 5.3.2).[107]

5.3.3 Payment Stacking

Draft Recommendation – Payment Stacking*: Payment Stacking with funds from programs identified as Public Dollars Dedicated to Conservation[108, 109] or "Fee-in-Lieu" (FIL) funds[110] is*

[104] Jessica Fox, RC Gardner, and T Maki, Environmental Law Institute, Stacking Opportunities and Risks in Environmental Credit Markets (2011), *available at* http://wqt.epri.com/pdf/credit-stacking-environmental-opportunities-and-risks.pdf; North Carolina Program Evaluation Division, Department of Environment and Natural Resources Mitigation Determinations: Special Report to the General Assembly, Rep . No . 2009-3 (Dec . 16, 2009); Alice Kenny, When is Credit Stacking a Double Dip?, Ecosystem Marketplace (2009), *available at* http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=7147&section=home.

[105] Minnesota Pollution Control Agency, Rahr Malting Company, NPDES permit MN003191, § 1.18 (draft 2012) ("Trade credits shall not be proposed or approved for sites which simultaneously track benefits for other environmental programs, including but not limited to wetland mitigation under the Wetland Conservation Act"); Minnesota Pollution Control Agency, Southern Minnesota Beet Sugar Cooperative, NPDES Permit MN MN0040665 (expired 2004) (stating the same).

[106] *See, e.g.,* Ohio EPA, Alpine Cheese Company, NPDES Permit Nutrient Trading Plan, at 16-17 (expired 2011) ("The broker also has the right to gain carbon, sediment, and nitrogen credits from the same conservation measures being installed if a buyer and documentation can be arranged").

[107]Climate Action Reserve, Nitrogen Management: Project Protocol Version 1.1, § 3.5.3 (2013), *available at* http://www.climateactionreserve.org/how/protocols/nitrogen-management.

[108] Public Dollars Dedicated to Conservation are those targeted to support voluntary natural resource protection and/or restoration, with a primary purpose of creating, restoring, enhancing, or preserving habitats. Some examples of these funds include Farm Bill Conservation Title cost share and easement programs, EPA 319 funds, U.S. Fish and Wildlife Service Partners for Wildlife Program, state wildlife grants, and other sources. Public loans intended to be used for capital improvements of public water systems (e.g., State Clean Water Revolving Funds and USDA Rural Development funds), utility stormwater and surface water management fees, and public funds raised from ratepayers are not Public Dollars Dedicated to Conservation.

[109] U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Watershed Enhancement Board, Oregon Department of Fish and Wildlife, Oregon Interagency Recommendations: Public Funds to Restore, Enhance, and Protect Wetland and At-Risk, Threatened and Endangered Species Habitats: Appropriate Uses of These Funds in Species and Wetland Mitigation Projects (2008), *available at* http://www.fws.gov/oregonfwo/LandAndWater/Documents/PublicFunding-final.pdf.

generally not allowed to pay for credits used for compliance purposes. Public Dollars Dedicated to Conservation (as defined in footnote 108) can be used to address Baseline obligations on the compliance portion of a Project Site. They can also be used to fund additional practices on portions of a Project Site that are outside the compliance credit-generating area boundaries (i.e., extended buffer areas, or extra management practices). Via Proportional Accounting, a Project Developer should identify the percentage of the overall project funded by Public Dollars Dedicated to Conservation, if any, and/or provide a map that clearly identifies which area of a Project Site can/cannot be funded by particular funding sources.

Commentary: Leveraging multiple funding sources is an important way to generate larger Water Quality Benefits or connect other environmental benefits to the BMPs being implemented to generate water quality Credits. The challenge is properly delineating the use of each funding source to ensure that the BMP actions generating water quality credits are Additional. The Payment Stacking debate balances the fact that some BMPs need multiple funding sources to become viable and the reality that less conservation will be completed with Payment Stacking (in addition to the fact that Payment Stacking might artificially lower credit prices). USDA explicitly states that any associated Credits generated from the BMPs that it funds via its conservation incentive programs belong to producers.[111] Several states allow USDA-cost share to fund the Baseline portion of a Credit-generating activity (*See* Section 2.3.6 on Baseline).[112]

DRAFT

---

[110] *Id.* at 2 ("FIL funds are used to satisfy agency programmatic mitigation obligations. Some examples of FIL funds include the Oregon Department of State Lands (DSL) Payment in Lieu Wetland Grant Program, and the Northwest Power and Conservation Planning Council, and Bonneville Power Administration Fish and Wildlife Program grants.").

[111] *See, e.g.,* 7 C.F.R. § 1410.63 (CRP program); 7 C.F.R. § 1466.36 (CRP program); 7 C.F.R. § 1467.20 (WRP program).

[112] WRI, Comparison Tables of State Nutrient Trading Programs in the Chesapeake Bay Watershed, at 11 (2011) (noting that Maryland, Pennsylvania, Virginia and West Virginia state guidance all allow for cost share funds to meet Baseline obligations).

6. Project Implementation & Quality Assurance Standards

In this section:

- What ensures that a project has been implemented correctly?
- What ensures that a project will be maintained?
- How long does a project need to be legally protected?

This section describes the standards needed to ensure that Credit-generating trading projects are appropriate, are implemented to a high standard, are maintained so that the credited Water Quality Benefits remain in place for as long as the Credits are used by a Buyer, and are consistent with other laws.

6.1 Initial project Site Screening(or "Validation")

Project screening is the process of vetting projects for program eligibility. Such screening can give the Project Developer, regulatory agency, and NPDES permittee a quick idea of whether the proposed project will meet established eligibility criteria. Not all programs include this kind of screening. It can be required as part of a regulatory process and/or used to provide confidence that projects will generate valid Credits later on.

Draft Recommendation – Initial screening*: A state agency, permittee, or approved third party may screen a proposed project for eligibility. If eligibility screening occurs, and the screener determines that a proposed project will fail to meet eligibility criteria, the screener should notify the Project Developer. If the project might be deemed eligible if changes were made to the proposal, the screener should also provide recommendations for revision and instructions for resubmission of the project plan. If the project meets relevant eligibility criteria, the screener can provide a written notice of eligibility.*

Commentary: An initial site or proposal screening can identify ineligible projects before anyone spends too much time or money implementing BMPs that may not be able to generate Credits. Screening is generally a good idea before project implementation begins. The considerations around which entity (e.g., state agency, third party, permittee, Project Developer) can and should perform this function are discussed in Section 10.

6.2 Consistency with other laws

Draft Recommendation – Consistency with other laws: *Because the purchase of Credits does not absolve a Buyer and/or its agents from compliance with other existing laws, prior to undertaking Credit-generating restoration work, a Project Developer should obtain all necessary permits and approvals (including those required under the National Environmental Policy Act, the Endangered Species Act, the Clean Water Act, state permitting laws, and county/municipal land use codes). The Project Developer should also comply with all applicable federal, state, and*

local laws/regulations, including those that may form the basis of Baseline requirements (which are described separately in Section 2 of this document).

Commentary: It is unclear which entity is responsible for determining consistency with other laws, and how much proof of that consistency a Project Developer would need to provide. Trading Guidance, Frameworks and/or Plans may therefore need to make this determination. On the one hand, Project Developers should be able to demonstrate their knowledge of applicable laws and provide details on how they are in compliance. On the other hand, it is likely to be difficult for a state water quality agency to Verify the accuracy of this information given that many rules apply in different locales for different land uses. In addition, where the legality of a project is called into question, water quality agencies would be unable to assess the likely compliance status for programs outside of their jurisdiction. It is also unclear whether attestations as to a project's compliance with existing laws have legal implications (e.g., self-incrimination), and if and how states may delegate the authority to make this compliance determination to a third party.

6.3 Project implementation quality assurance

Trading Guidance, Trading Frameworks and/or Trading Plans need guidelines for BMP design and performance standards. Those guidelines make sure a BMP is operating and being maintained appropriately, and in a way that meets the assumptions modeled in the Credit calculation. BMP guidelines are also an avenue for ensuring that the actions taken on the ground are consistent with water quality laws and regulations, and for enhancing ecosystem function in a way that is ecologically responsible and contributes toward Watershed health and resiliency (e.g., using native species in riparian forests instead of non-native hybrids).

Draft Recommendation – Project quality standards: *In order to ensure that BMPs produce Credits that appropriately capture the Water Quality Benefit they represent, each eligible BMP should be designed, constructed, and maintained using a BMP guideline defined and approved by the relevant state agency. Those guidelines will likely be approved as part of a permittee's Trading Plan if they have not yet been pre-approved by the agency. In cases where site-specific considerations necessitate a different design or maintenance standard, the Project Developer will need to work with the state water quality agency or their approved third party for approval of a site-specific BMP guideline.*

Commentary: BMP quality standards should strive to balance flexibility in how projects are implemented (allowing Project Developers to be responsive to changing farm practices and seasonally-specific BMPs) with the certainty and dependability of project quality that is required for trading to be a viable method of complying with permit limits.

6.4 Project design and management plans

For structural and practice-based BMPs, it makes senses to include requirements for the design and management of the practice at project sites in the Trading Guidance, Trading Framework, and/or Trading Plan.

Draft Recommendation – Project design and management plans: *So that BMPs are consistent in quality and content level across project plans, Project Developers should develop an ecologically appropriate project design and management plan that conforms with approved BMP quality standards, outlines specific improvement and restoration goals, includes a plan for reporting on project Site Performance and maintenance actions, and performance milestones for ensuring that these goals are achieved in the future. Minimum components of these project design and management plans should be referenced in a Trading Plan, but more detail may be developed for individual project sites.*

Commentary: The project design should describe the proposed actions, restoration goals, anticipated threats to project performance, etc. The management plan component details how the Project Developer plans to keep the practice in place and consistent with BMP guidelines (e.g., maintaining fences, controlling weeds in riparian buffers and other actions for the life of a Credit). The term "ecologically appropriate" is intended to capture the idea that BMPs designed to reduce one type of pollution, do not unintentionally create a negative impact for another part of the ecosystem (e.g., it may not be appropriate to build a manure storage lagoon to generate phosphorous Credits on top of a vernal pool that contains sensitive species). The term is also intended to provide room to promote ancillary benefits of BMPs (e.g., in addition to providing temperature benefits, riparian shade also generates fish and wildlife benefits).

6.5 Project stewardship – adequate legal protections and stewardship funds

Having adequate stewardship protections ensures that the planned-for installation, operation, and maintenance outlined in the Project Management Plan actually occur. Two primary actions can help make sure that projects materialize as planned. First, project sites/BMPs should have adequate legal protections for the duration of the Credit and Project Life. Second, Project Developers should demonstrate that they have adequate funding to steward the site for the duration of the Credit Life. Different BMPs will require different project protection periods.

Draft Recommendation – Ensure project site has adequate legal protections and stewardship funds for duration of Credit usage period: *Project sites should be adequately protected by legal instruments, where appropriate. These protections should remain in place for the duration of the Credit usage period, be legally enforceable under relevant state laws, and should run with the land (e.g., leases, conservation easements). Ideally, these protections should also mitigate against proximate disturbing land use activities. Project sites may have pre-existing protections (e.g., easements or public land designations for conservation use) that do not require additional*

protections. Project Developers should also demonstrate that they have adequate funding to steward project sites for the duration of the Credit life. These types of protections include performance bonds, restricted accounts, insurance, etc.

Commentary: none

Draft Recommendation – Minimum BMP/project protection period: *A minimum project protection period can help reduce transaction costs and increase certainty of BMP performance over time. For structural BMPs (e.g., fencing or riparian restoration), the minimum BMP/project protection period should be twenty (20) years. For practice-based BMPs (e.g., cover crops and tillage), the minimum BMP/project protection period should be five (5) years. Any other irregular term may be applied at the discretion of the regulatory agency. Site protection of structural and non-structural BMPs will generally occur through limited-term leases or other contracts, although easements may be used if the benefits of a BMP are expected to be more permanent.*

Commentary: The BMP/project protection periods above were selected because water quality impacts are rarely permanent, and so it may not make sense to structure water quality improvement projects as permanent solutions. Moreover, many wastewater utilities—likely Buyers in many trading scenarios—rely on 20-year planning periods, and so it is logical that project protection periods ensure that a project is valid until the utility's next planning cycle. Standard contract lengths are preferable, but should be balanced with flexibility to adjust BMP selection based on crops grown, market conditions, and environmental conditions. In the event that the mixture of BMPs implemented at a site changes in a given year, this might trigger a re-calculation of Credits and additional Verification, which could increase transaction costs significantly. Shorter-term protections may be considered if supply constraints arise or Regulated Entities develop diversified Credit portfolios. There are also significant learning curves and costs involved in the first year of a project generating Credits. Even for practice-based BMPs that can change year-to-year, a longer site-protection period seemed appropriate. If the 5-year period becomes a barrier to Project Developers bringing Credits for sale, then that minimum period can be revisited.

DRAFT

7. Project Verification & Certification

In this section:

- What gets Verified and by whom?
- How often does Verification occur?
- Who certifies Credits?

Verification is the process of confirming that a Credit-generating BMP has been implemented properly, that Credits have been quantified accurately at the site, and that the BMP is continuing to function over time. Verification can be performed by an agency, permittee, or third party (collectively "Verification Entities"). Whichever Verification Entity performs the function should fully understand the quality and performance metrics associated with the BMPs being Verified, as well as the tools used to quantify Credits. Verification is not the confirmation that a Trading Solution is achieving its overall goals, but is a confirmation that the BMPs installed at a particular site are meeting the requirements of Trading Guidance, Frameworks, or Plans.

Verification is a separate and additional step apart from the discharge monitoring conducted at wastewater facilities. Because point-Nonpoint trades often involve various types of BMPs (each with its own unique requirements), installed at numerous and disperse Nonpoint Source locations, it is important to provide additional opportunities to review and approve water quality trades, frameworks, and/or Project Developers. Similar to the confidence engendered through Point Source DMRs, project Verification is intended to provide Regulators and the public confidence that the anticipated water quality improvements will accrue over time. Verification and Certification are just two parts of a project's review process. The other phases are screening (previously discussed in Section 6), and registration (discussed in Section 8).

There are different Verification methodologies, which may be combined in various ways depending on the structure of a program. One approach is to inspect every BMP project or a sample of projects; another involves qualification of a Project Developer or third party to implement projects; yet another might be to approve an overall trading program with the option to inspect a representative sample of individual projects. These options are not exclusive, and each methodology has advantages and disadvantages. Ultimately, Verification attempts to balance the need to ensure that BMPs are creating real Water Quality Benefit with the associated costs of inspecting numerous and widely distributed BMPs.

Once Verification is complete, formal "Certification" is a final administrative review that the Credits are valid and that all necessary documentation is in place. Once projects are Verified and Certified, the Credits generated from those projects are uploaded, or "registered," to a ledger (*see* Section 8). Registration provides public disclosure, a mechanism to track Credit quantity and ownership for compliance and enforcement, and a way to ensure that Credits are

not being used more than once. Each state or program may choose the appropriate frequency, scope and nature of Verification, Certification, and Registration.

Verification methodologies may vary by state and Watershed program depending on preferences and capacities within state agencies, permittees, and third parties. This section also discusses site Verifier accreditation, Verification frequency and content, and formal Certification of Credits.

7.1 Verification of Project Sites and Credits

Draft Recommendation – Verification: *Completed projects should be Verified onsite by a state water quality agency, the permitted Point Source, or an independent third party to determine compliance with appropriate standards. Any Point Source or third party performing Verification should develop a "Verification plan," which is approved by the state water quality agency. The Verification plan should describe the proposed methods of Verification, qualification requirements for Verifiers, and the Verifier's protections against conflicts of interest. The Verification plan should also clarify whether on-site inspection should occur for every BMP, or a representative sample. Even where a state water quality agency does not perform the Verification, it may choose to inspect a Credit-generating project or trading program at any time according to the relevant procedures outlined in the guiding regulations or statute.*

Commentary: Independent project Verification—from either a third party, or a water quality agency with authority to enforce water quality laws—provides significant programmatic integrity for the general public (i.e., neutral review of quality and integrity), and for permitted entities that rely on trading as a compliance solution. It also presents several challenges, including the interest and willingness of states to require Verification; the question as to which entity will conduct the Verification (and if not done by states, how to qualify permittees or other Project Developers to self-verify, or approve independent parties to perform this service); and additional costs for an activity that is not typically required by Regulators.

In a NPDES framework where permittees and their contractors self-monitor their discharges, they should also monitor BMP projects as their permit requires. Permittees should think about the qualifications of staff doing the Verification, what kinds of review and quality assurance are needed, and if any considerations for the independence of staff doing Verification are needed.

Common Verification architecture (e.g., Verification protocols, training and accreditation services, contracting procedures and templates) in the region could make Verification more efficient to implement and enforce and easier for the public to understand.

7.2 Project site Verifiers

Draft Recommendation – Qualifications of project site verifiers: *To ensure the integrity of the Verification process, all project verifiers for entities should be qualified to inspect lands for*

particular Credit-generating BMPs in a particular geography. To ensure that verifiers are sufficiently qualified, states should consider outlining minimum qualifications for all verifiers, which may include training and accreditation.

Commentary: Minimum qualifications ensure that regardless of who performs Verification, verifiers are similarly and properly suited to analyze a particular project. Consistent training and accreditation programs can help ensure verifiers are qualified.[113] Defining minimum qualifications and outlining how verifiers should be trained to meet them would be helpful for water quality trading programs.

7.3 Content of initial Verification

Draft Recommendation – Content and frequency of initial Verification*: After BMP installation, the project verifier should confirm that Credit generating BMPs are eligible, that estimated Credit quantities are accurate, that BMP design is consistent with approved guidelines, and that the Project Developer has an adequate management plan and legal protection for the duration of the Credit usage period. In some cases, on-site visits might be conducted on a sample of projects, particularly where an individual BMP has a satisfactory performance history.*

Commentary: none

7.4 Frequency and content of ongoing Verification

Project Site Performance should be confirmed frequently according to an approved schedule to ensure that the sites are producing Credits according to plan.

Draft Recommendation– Frequency and content of ongoing Verification**:** *Ongoing Credit Verification should occur frequently. The appropriate frequency may differ by circumstance and BMP (e.g., irrigation and farm management BMPs may need to be verified monthly or seasonally, whereas structural BMPs may need to be verified annually or periodically). As part of Verification, an onsite Site Performance monitoring visit may be required after completion of the BMP and at other defined intervals thereafter. In years in which no on-site monitoring occurs, Verification should include review of project performance reports.*

Draft Recommendation – Project performance reporting frequency*: A Project Developer should gather information on a site's BMP performance at least annually, and make that information*

[113] *See e.g.,* Or. Admin. R. § 340-071-0650 (Oregon DEQ provides training and Certification requirements for third party on-site wastewater treatment system installers and maintenance providers).

available for review by verifiers (and the agency if they are not the verifier) based on requirements for applicable BMPs. In some cases, confirmation of project performance might occur more or less frequently. For some BMPs (e.g., altering flow regimes, or where they may be prone to failure), confirmation of project performance may need to occur continuously or at frequent intervals. For some structural BMPs, confirmation of project performance may occur less frequently after the BMP has been established and confirmed as providing its full function.

Draft Recommendation – Annual project performance reporting from Project Developers to Credit Buyers*: Project Developers should provide Credit Buyers an annual report of each project site that confirms the project is still functioning/is on-track to function as planned. Annual Site Performance reports should include a comparison of Site Conditions to performance targets for the installed BMPs, a comparative set of photo points from the site, any significant changes or shortcomings of the site, and actions planned to address any significant problems. Parts or all of these annual Site Performance reports may be used in the compliance report summarizing the status of all projects active under the permit (if required as a permit condition associated with trading).*

Annual performance reports for individual project sites should be made available for review through an online Registry. The information in these reports should balance access to information against privacy and security concerns. Both the Project Developer and the permittee should retain copies of all Site Performance and annual compliance reports and records for the duration required of them by federal and state water quality regulations.

Commentary: Trading Guidance, Frameworks, and/or Plans need guidelines for how BMP implementation should be confirmed and maintained at individual project sites after they are installed and Credits are verified and issued. For Trading Guidance, Frameworks, and/or Plans that cover hundreds of distributed BMPs (e.g., nutrient BMPs across an irrigation district), it may not be reasonable to monitor every BMP annually or more frequently. It may make sense to sample and inspect a rotating subset of BMPs each year (e.g., 50% of all BMPs are monitored each year), and to inspect sites at regular intervals (e.g., every five years). Guidelines for each eligible BMP should include a description of required data to be collected, frequency of ongoing Verification, and data collection methods.

In general, in conjunction with reports describing the aggregate performance of a permittee's Trading Solution, it may make sense to make annual project monitoring reports available to the public through the Credit Registry and/or upon request. Project reports should be careful to balance landowner privacy with access to information.

7.5 Certification

Draft Recommendation – Certification: *The relevant water quality agency, permittee, or an*

approved third party should provide a formal written Certification of Credits from individual projects, including confirmation that Verification has occurred, a review of the verifier's report, and confirmation that all necessary documentation is in place and that Credits are ready for registration.

Commentary: Credit Certification is the final step before a Credit can be used, and includes a confirmation that all necessary paperwork and documentation are in place to support the quantity of Credits proposed for registration. Certification does not refer to the approval of a trade or the transfer of Credits between parties. At the outset, state agencies may be more actively involved in project Verification and Certification. Over time, agencies may reduce their engagement in certifying individual projects unless a compelling reason to do so arises.

DRAFT

8. Registration

In this section:

- What information is publicly reported?
- Where is that information reported and to whom is it available?

NPDES permit monitoring reports and other required information is generally available to the public for inspection, review, and oversight through agency websites or upon request. Trades of Credits associated with such permits should also be available to the public for similar purposes. Credit registration is a transparent way of providing this information because it allows for disclosure and provides an easily searchable version of a permittee's ledger of Credits. A Registry thus allows agencies, the public, and permittees themselves to be sure that trades are helping to meet WQBELs, and that Credits are not being used for more than one purpose.

8.1 Public disclosure and serialization of Credits

Draft Recommendation – Public disclosure and serialization of Credits: States should provide or designate a publically available Registry or website for all Credits so as to provide easy and timely access to information for Regulators and the public. *Each Credit should be assigned a unique identifier or serial number through the registration process. The Registry should allow the public to search for a particular permittee or trading program at no cost, and should display Credits sold and used for permit compliance. Registration provides transparency and ensures that Credits are not sold more than once to different Buyers.*

Commentary: As noted in the 2003 EPA Trading Policy, "[e]asy and timely public access to information is necessary for markets to function efficiently and for the public to monitor trading activity."[114] As such, consistent and transparent information on Credits and trades should be available online to allow the Regulators and the general public an easy method for tracking a permittee's trading activity and compliance. States may use their existing NPDES tracking databases to post Trading Plans, and other relevant trading information. Even if the Registry is not a dynamic website (e.g., Mark-It Environmental Registry), registration information should be posted online even if just posted as a .PDF or .XLS file. Using common infrastructure in a region or state may reduce the resource burdens on water quality agencies.

A Registry serves several functions. First, it provides a program-level accounting of Credits generated and used. A Registry can prevent Credits from being sold more than once and ensure

[114] 2003 EPA Trading Policy, 68 Fed. Reg. at 1612.

that a Credit generating action is not sold twice as Credits in separate environmental markets. A central Registry can serve many of the same purposes of the DMR by providing a current accounting of Credits purchased and held by permittees. A Registry can also link those Credits to supporting documents (e.g., Verification reports and Credit quantification results) ensuring that Credits are performing as promised. Finally, registries that are web-enabled can increase public transparency for trading programs and make searching for information easier.

Registration is a balance between providing full access to information and ensuring that information collected by the agency and provided to the public is not all considered "reviewed" by the agency. A central Registry is also only as good is the completeness of information that is in it. If a Registry only has 75% of all Credit information, then it is not providing its full use. For many current trading programs, transaction volumes are small and there may only be one or two permittees in a Trading Area. At that scale, the costs of registration may appear high relative to the transparency value they provide to permittees and agencies.

8.2 Information for public disclosure

Draft Recommendation – Information for public disclosure: *As noted in the 2003 U.S. EPA Trading Policy, "EPA encourages states and tribes to make electronically available to the public [1] information on the sources that trade, [2] the quantity of Credits generated and used on a Watershed basis, [3] market prices, where available, and [4] delineations of Watershed and trading boundaries."[115] In addition to EPA's statements on making information available in the 2003 U.S. EPA Trading Policy, each Credit Registry should provide: (1) project latitude and longitude location; and (2) the identities of the parties to the Credit transaction and correlating permit (if applicable). The listing should also provide, to the extent practicable: (1) Verification and Certification reports; (2) project Site Performance reports (including a representative set of photo points) and stewardship plans; and (3) project design and corroborating eligibility information. Sensitive or proprietary information that is not required for Credit transparency (e.g., private landowner names and addresses, unrelated third party contact information, and/or proprietary or confidential information) may be redacted or kept confidential.*

Commentary: Many of the materials included in the draft recommendations may exceed what is currently required of Regulated Entities under NPDES permit monitoring reports and other documents. Nonetheless, as noted in the 2003 U.S. EPA Trading Policy, "[t]his [type of]

[115] 2003 EPA Trading Policy, 68 Fed. Reg. at 1612.

information is necessary to identify potential trading opportunities, allow easy aggregation of Credits, reduce transaction costs and establish public credibility."[116]

Some documents used by a verifier to approve Credits may contain sensitive or proprietary information. The registration process should balance protection of sensitive or proprietary information with the need to be transparent. Agencies may consider drafting guidelines that detail which information should be confidential, which information should be actively posted to the Registry, and which information is subject to public review but not actively posted to the Registry.

DRAFT

[116] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

9. Compliance Determination & Enforcement Actions

In this section:

- How is permit compliance determined?

Compliance and enforcement of the Watershed Trading Frameworks and permittee Trading Plans will depend on the rules and statues governing the water quality trading and NPDES programs in each state. If a state has statues and rules covering the development and implementation of a trading program, then these statutes and rules would need to be followed with respect to trading. If the trading program and Trading Plan are implemented through the NPDES permit, then the permittee must also be in compliance with the specific permit conditions of their permit related to trading to be in compliance with their Trading Plan.

The regulatory agency will identify in the permit how it wants the permittee to document compliance with the specific permit conditions. In particular, the agency may require that a permittee include specific numeric information and/or trading-related comments in the DMR, and/or that a permittee submit required reports. Failure to provide the agreed upon information in the manner and schedule specified in the permit would be considered a permit violation. Enforcement of these violations would follow the rules and guidance documents governing the specific state or federal agency's enforcement program.

Draft Recommendation – Compliance determination and appropriate enforcement actions: *Compliance is determined as the permittee demonstrates, via its DMRs and other reporting requirements, that it has secured and continues to hold an adequate Credit balance to meet its established Effluent Limits. In addition, a permittee must comply with all special condition provisions included within its permit, and all enforceable aspects of its Trading Plan (if not included in the permit).*

Commentary: A permittee has either provided the required information and is therefore in compliance with its permit, or it has not, and is therefore not in compliance with its permit. The most likely permit violations linked to trading will stem from insufficient Credit balances or failure to meet special conditions (e.g., incomplete or missing monitoring reports).

If a state has separate statues or rules regarding water quality trading, those participating in trading will need to be in compliance with these statues and laws in addition to their permits. The consequences of a failure to comply with permit conditions and/or statutes or rules will be determined under the compliance/enforcement rules and guidance developed and implemented by the state or federal agency with enforcement authority.

10. Roles & Responsibilities in Program Administration

In this section:

- What are the roles in administering trading?
- What should be considered in assigning responsibilities for trading administration?

10.1 Roles and responsibilities in Trading Framework or plan administration

There are four phases of the Credit issuance process that provide agencies with an opportunity to review and approve trading project documentation: Validation/Site Screening(Section 6.1), Verification (Section 7), Certification (Section 7.4), and registration (Section 8). In addition, a fifth element—"standards development"—underlies each of these processes and is the direction needed by permittees and others to understand and participate in trading. For each of these phases, agencies and trading program participants need to consider the following when determining whether the state agency, permittee, or a third party is the best entity to perform each phase:

a. **Skills/Expertise Required to Perform Each Function**: One question to address for each of these functions is the type of expertise and skill involved in performing these functions. Some functions are largely "administrative" (such as paperwork review), whereas others might require familiarity with specific ecology and land management practices (e.g., identification and evaluation of on-the-ground actions).
b. **Administrative Time and Costs**: A second factor in determining the appropriate entity to perform each function is the amount of administrative time and effort involved in the work. There also may be efficiencies gained by grouping functions under one entity (e.g., Verification and Certification).
c. **Requirements versus Recommendations**: A third matter for a regulatory agency to consider is which of these enumerated phases it will require of permittees in written permits or plans, versus which phases it will only recommend. Resource constraints and/or opportunities for potential conflicts of interest on the part of the permittee or third party may be factors in agency decision making.
d. **Reliance on Third Parties to Execute Trading Functions**: As regulatory agencies explore whether they may wish to use third parties to execute any of these trading program functions on their behalf, each agency should consider whether it needs to provide some form of written authorization, formally delegate, designate, or assign functions to those third parties. Under each of these options and scenarios, the relevant agency would retain oversight and final decision-making authority. Neither the CWA nor relevant law in states in the Pacific Northwest currently prescribe the aspects of a trading program that can be delegated or what type of arrangement would be required between the permitting agency and third party. However, there are a number of

examples where agencies have relied on third parties to help execute state programs.[117] In keeping with those examples, reliance on third parties for programmatic functions may be most appropriate where: specific expertise is required; demand is unpredictable and requires flexibility of resources; and/or a high volume of transactions might require agencies to spend more time and money to perform tasks than is available in state budgets.

Generally, a state agency should consider the following in electing to rely on a third party to execute one or more functions:

i. The more extensive the third party responsibilities, the more formal and extensive the state-to-third-party mechanism might be (thus, necessitating some form of official contractual arrangement or delegation mechanism);

---

[117] *See, e.g.,* Amended and Restated Delegation Agreement between North American Electric Reliability Corporation and Western Electricity Coordinating Council, § 4 (2011, approved by FERC March 1, 2012), *available at* http://www.wecc.biz/library/WECC%20Documents/Business%20and%20Governance%20Documents/Delegation%20Agreement%20-%20Version%207.pdf (North American Electric Reliability Corporation (NERC) delegation to the Western Electricity Coordinating Council (WECC) to develop reliability standards, and to monitor/enforce); Letter from Pam Inmann, Exec. Director of Western Governors' Ass'n, to Ronald Nunnally, Chairman of the Western Electricity Coordinating Council (July 19, 2004), *available at* http://www.wecc.biz/committees/BOD/072904/Lists/Agendas/1/0704_WREGIS_Agenda_Item_VII.pdf, WREGIS, Operating Rules § 1 (2013), *available at* http://www.wecc.biz/WREGIS/Documents/WREGIS%20Operating%20Rules.pdf (Western Governors' Association delegation of authority to the Western Renewable Energy Generation and Information System (WREGIS) to develop and manage online renewable energy Credit Verification & Registration); Electric Power Research Institute, Pilot Trading Plan 1.0 for the Ohio River Basin Interstate Water Quality Trading Project (2012), *available at* http://www.farmland.org/documents/ORBTradingPlan8-6-12V2FINAL.pdf (Indiana, Kentucky and Ohio, and Ohio River Valley Water Sanitation Commission (ORSANCO) Delegation of Authority to the Electric Power Research Institute (EPRI)); Or. Admin. R. §§ 340-071-0100, 0650 (Oregon DEQ delegation of On-Site Wastewater Treatment System Monitoring & Inspection Authority to Certified Maintenance Providers); Cal. Code of Regs., Tit. 17, §§ 95802(21), 95802(148), 95986 (2013) (The California Air Resources Board allows for independent third parties to implement offset projects, and to perform registration and Verification services in its new greenhouse gas trading program); 42 U.S.C. §§ 9601(35)(B)(i)(I); 9607(b)(3), 40 C.F.R. § 312.11(a) (EPA delegation to ASTM of "All Appropriate Inquiry" Standard Development for Hazardous Waste Pre-Purchase Assessment Requirements); Columbia River Gorge National Scenic Area Act, 16 U.S.C. § 544 – 544p (Congressional delegation of management, monitoring, enforcement & standard development authority to the Columbia River Gorge National Scenic Area Commission); Nat'l Parks Conserv. Ass'n v. Stanton, 54 F.Supp.2d 7, 10 (D.D.C. 1999) (Congressional delegation of private land management responsibilities in congressionally-designated Wild & Scenic River corridor to a local management council).

ii. The agency should retain decision-making, approval, and oversight authority (authority to cancel the delegation is not sufficient control);
iii. The state agency should retain dispute resolution authority; and
iv. Designees or agents of the agency should also be screened for conflicts of interest.

e. ***Access to Information & Privacy***: Water quality trading brings private landowners, federal and state agencies, and businesses to the table in a way that has not typically occurred in the past in order to improve Watershed health. As these entities conduct business together in new water quality trading programs, federal and state agencies will need to consider how and what types of information will be generated and shared among these parties. In addition, these parties may have traditionally been subject to different regulations, laws, and federal agency authority, and may not be as familiar with CWA regulations. If third parties are also gathering, reviewing, and maintaining information on behalf of a state agency as part of a trading program, public access to generated records will need to be specified. Agencies will need to evaluate these factors, relevant public disclosure requirements as well as exemptions, and any physical location constraints in ascertaining how the public will have access to trading-related documents.

Though rules or guidelines regarding public access to trading records may be less detailed than states' existing general public records guidelines, an inference may be made that the same guidelines would apply to trading information and records collected and maintained by the relevant state agency. In Oregon, the 2009 Water Quality Trading IMD states that "information on individual trades, trading programs, trading results, and compliance and inspections reports for specific permittees are available for the public review from DEQ upon request".[118] In Idaho, Washington, and other states where existing trading programs are in similar early stages, agencies have recognized the importance of transparency and public access but are likewise in the process of refining these frameworks to balance disclosure and landowner confidentiality concerns. Idaho DEQ has developed a trade notification form and reduction Credit certificate that must be submitted to Idaho DEQ as part of the process. Such information would be kept on file at Idaho DEQ offices and would be subject to public inspection.[119] Washington

[118] Oregon DEQ Water Quality Trading Internal Management Directive, at 8 (December 2009), *available at* http://www.ecy.wa.gov/programs/wq/swqs/WQTradingGuidance_1010064.pdf.

[119] Idaho DEQ Water Quality Pollutant Trading Guidance, at 18 (July 2010), *available at* http://www.deq.idaho.gov/media/488798-water_quality_pollutant_trading_guidance_0710.pdf.

Department of Ecology's draft Trading Framework also notes disclosure as an important element of a credible water quality trading program,[120] but the state does not yet articulate what information should be disclosed. As programs are developed, agencies may elect to stipulate disclosure requirements in permits and plans clearly and timely wherever possible, and if needed, to distinguish types of document content that may be exempt from public release under Freedom of Information Act commercial information exemption categories to avoid later misunderstandings.[121]

Importantly, agencies will need to consider whether other documents created or maintained by third parties in trading programs (i.e., those not required by, or submitted to, the relevant agency) qualify as public "records."[122] For example, in Oregon, the NPDES permit held by the City of Medford states that "DEQ approval and public review is not required for trading agreements, specific project sites, or minor amendments to the program provided they are consistent with the overall direction and objectives of the permittee's DEQ-approved Credit trading program. "[123] As a component of the permit, Medford must make certain information (e.g., project names and addresses, general project descriptions, and site monitoring and planting information) available to DEQ within fourteen days of request. Some of this information may be exempt from public disclosure under existing Oregon laws.[124] However, absent clear direction from regulatory authorities or specified third party contractual/delegated obligations, it may not be readily apparent to trading participants and the public whether some trading-related information privately gathered or kept by third parties would qualify as a public record. This matter may be of particular importance to stakeholders and trading participants in nascent programs.

---

[120] Washington DOE Draft Trading Framework Paper for Review and Comment, at 4 (September 20, 2010), *available at* http://www.ecy.wa.gov/programs/wq/swqs/WQTradingGuidance_1010064.pdf.

[121] 5 U.S.C. 552(b)(4); 40 C.F.R. § 2.208 more specifically outlines the substantive criteria to be used in determining matters of confidentiality: a business must assert a claim, take reasonable measures to protect confidentiality, and the information must be generally unavailable elsewhere. In addition, disclosure of the information must not be compulsory elsewhere under statute, and the business must also show that disclosure of the voluntarily-provided information would hinder an agency's ability to obtain information in the future, or that disclosure of such information would cause substantial competitive harm.

[122] *See* 5 U.S.C. § 552(f)(2)(A)-(B).

[123] NPDES Waste Discharge Permit for City of Medford, at 21 (December 13, 2011), *available at* http://www.deq.state.or.us/wq/trading/docs/MedfordNpdesPermit.pdf.

[124] *See* ORS § 192.502.

10.2 Roles for Initial Screening

Draft Recommendation – Initial Screening (or Validation): *Initial screening is an optional, but recommended, initial desk review of potential projects' eligibility, design, and associated Credit calculation inputs. The task requires comprehensive knowledge of the relevant Trading Plan(s) and standards, an understanding of the proposed Credit generating action, and the protocols for applying the appropriate Credit Quantification Method. The entity conducting this screening needs to have knowledge of these specific technical tasks and be able to quickly respond to requests for Validation. Since Validation is an initial check on project eligibility, it may be less appropriate for agency staff to lead this phase. Differences between Credit developers and the entity performing Validation at this phase can be referred to agencies for resolution.*

Commentary: In trading programs with clearly defined eligibility criteria, this phase should be optional at the Project Developer's election. As the Project Developer is the primary beneficiary of this phase, they should retain the ability to decide whether to submit projects for initial screening on a case-by-case or program-by-program basis. In nascent programs where there is significant room for interpretation or misunderstanding of eligibility criteria, it may be more difficult for permittees or Project Developers hired by permittees to independently make an accurate assessment. Accordingly, greater time and assistance may be expected from program administrators. This phase also has other benefits that lead to more efficient and effective program operations. For example, initial check-ins on projects let market administrators know how many projects are likely to move through the Credit issuance process, and creates information on the types and number of sites that do not meet eligibility criteria.

10.3 Roles for Verification

Draft Recommendation – Verification: *Verification is the recommended, detailed review of a site's Credit calculation amount, confirmation of proper implementation and/or performance of Credit generating actions, and review of site and stewardship documentation. Verification is an important step in trading program oversight because it confirms that projects have been implemented prior to the issuance of Credits, and that the projects continue to perform in accordance with the relevant performance standards. During this stage, site visits may occur to confirm that Credit generating actions are installed or performing.*

As Verification is a deep and complete look at the Credit-generating project, it provides agencies and the public with a level of assurance analogous to DMR reports that the promised Water Quality Benefits will be realized. Whichever entity conducts Verification should submit a detailed Verification plan describing who conducts Verification, what information is reviewed and when, and how the Verification entity will avoid conflicts of interest. That Verification plan should be reviewed and accepted by the relevant water quality agency. Where agencies do not have available resources or expertise to conduct Verification

themselves, they should designate an appropriate third party administrator or the permittee via their approval of the permittee's Verification Plan.

Commentary: Verification requires the most time, skill, and independence of all steps discussed in this section. Verifiers need the same ability to understand, interpret, and make decisions about eligibility standards as does the entity validating projects. Verification requires additional familiarity with Quantification Methods and tools, typically to the level required to duplicate and confirm the Credit calculation process. This may require access and the capacity to use GIS and water quality models, and professional expertise. Because Verification requires visual assessment of BMPs for proper implementation and/or performance in accordance with quality standards, this step requires intimate familiarity with the specific BMPs being verified. Stakeholders participating in and observing trading also need to have a high level of trust in a verifier's credibility and transparency. The combination of technical skills and perception can thus limit the pool of possible verifiers.

If agencies choose to conduct Verification, they may need to grow or shrink staff capacity to manage the ebb and flows of trading over time. Managing Verification does give agencies more direct control over the Credit issuance process at the project level.

Since the NPDES program is traditionally a self-reporting system, there is an argument that permittees should decide whether they have the capacity to self-verify projects or whether they should work with an approved third party to fulfill this role. No matter who performs the Verification function, there needs to be documentation of who will conduct Verification, what gets verified and when, and what happens when a verifier discovers a problem. This Verification process can be described in a Verification plan, which itself can be included in a permittee's Trading Plan in support of its NPDES permit. Avoiding conflicts of interest is also an important part of Verification. If third parties or permittees conduct Verification, there needs to be a clear process for identifying, avoiding, and mitigating any conflicts of interest.

The frequency and intensity of Verification can also have significant cost implications. There is a balance between high transaction costs and being sure projects perform according to necessary quality standards. As agencies and trading program participants strike this balance within Verifications plans, they may choose to verify Credits annually or less regularly, verify all Credit generating actions or a representative sample, or other approaches. If agencies allow permittees to self-verify their own BMPs, agencies may choose to audit a portion of Credits or ensure consistent application of the approved Verification plan. Third parties may have more flexibility to avoid conflicts of interest and may have the ability to grow and shrink more rapidly in response to fluctuating transaction volumes. If trading participants elect to use a third party, the relevant agency may need to formally designate responsibility to the third party.

10.4 Roles for Certification

Draft Recommendation – Certification: *Certification is the point where a verified project is transformed into Credits that can be used by an NPDES permittee to offset its discharges. A critical desk review exercise, Certification is the final approval of project documentation completeness before a Credit is made available for sale. If Verification and Certification are performed by the same entity, Certification can be easily folded into the Verification process. Certification by an agency or market administrator may be more important where Verification is conducted by the permittee or a third party.*

Commentary: Certification provides a final opportunity to review documentation at the final stage before Credit issuance, giving a complete picture of the project and its assessment through the Verification process. Certification often requires less time and capacity than Verification or Validation. Performing Certification can be a good way to keep agency staff in the loop as projects enter the trading program. However, separating Certification for Verification can lead to redundant processes—increasing transaction costs, and creating more opportunity for disputes. On the other hand, redundancy could be important for increasing confidence in the validity of trades. For example, if a permittee conducts Verification and an agency certifies each project, both organizations are likely to repeat much of the same work—reviewing eligibility documentation, Credit calculations, project design and management plans, etc. Similar to Verification, stakeholders need to trust the certifier. If there is no entity that has the technical skills to do both Verification and Certification, it may make sense to split these roles.

10.5 Roles for Registration

Draft Recommendation – Registration: *Registration is the public act of creating the official record of Credit issuance and ownership, and how the Credit is being used. A Registry is the central repository and tracking system with complete and current data. A Registry ensures that Credits are not sold more than once, that transactions are recorded, and that users and the public can review activity within a trading program.*

A Registry database may come in several forms: a state- or regionally-maintained central Registry; a market administrator-maintained ledger; or a permittee-posted database. Regardless of which entity manages the Registry, any sensitive information should be securely managed.

Commentary: A central database may be a state-maintained central Registry, it may be a market administrator-maintained ledger, or it may be a permittee-posted database. The operator of the Registry is not critical so long as the Credit-related information can be found in a consistent and reliable way.

10.6 Roles for Standards Development

Draft Recommendation – Managing Standards Development: *Standards development is*

essential for consistently and legitimately translating ecological benefit into a Credit that can legally offset an impact. These rules and metrics are used in Validation, Verification, Certification, and registration to predictably and fairly operate across Watersheds and as applied to different permittees. Standards development also includes Adaptive Management to improve these elements of a trading program with new information over time.

Managing standards is a process-oriented task that requires the ability to manage multi-stakeholder processes and interests. Entities facilitating development of these standards need to understand the science, policy, and economics behind trading. For ongoing Adaptive Management, there also needs to be some capacity to process new information, critiques, and requests for clarification in a timely and structured way.

Commentary: Every year of a trading program involves enormous learning. Experience drives improvements in how Credits are quantified, understanding of which processes provide value and which are costly, and a clearer idea of additional guidance needed. Some entity needs to be responsible for developing and issuing version iterations of Quantification Methods and protocols (i.e., Versions 2 and 3 of a particular method). In some cases, this might be a permittee, but a permittee may not be able to lead broader processes that develop tools and standards for the entire state or multiple permittees. Agencies can more easily manage standard processes and methods linked to law, rule, and policy. However, an agency may not have the capacity to lead the regular Adaptive Management cycles needed to constantly improve trading programs, but they need to be intimately involved.

Third parties may have more flexibility to coordinate Adaptive Management, but they may not have the dedicated funding streams to support those efforts over time. If authority to develop and/or adaptively manage standard processes and methods is delegated to a third party, the delegating government agency should retain oversight and final decision-making/approval authority over final approval/release. Specific to building new processes and methods, the delegating government body should provide a process for approving/modifying those elements of a trading program. The processes and methods third parties develop may also not be as effective if agencies do not have some process in place to approve new versions and processes developed through a third-party Adaptive Management process.

DRAFT

11. Adaptive Management & Tracking Effectiveness

In this section:

- Does trading need Adaptive Management?
- What are the components of an Adaptive Management framework for a trading program?

Current challenges in water quality make critical the exploration of innovative approaches in fairly rapid timeframe. In these cases, it is important to move forward with the best information currently available and to test assumptions through the collection and incorporation of new data as it comes available. This process is broadly referred to as Adaptive Management. More specifically, Adaptive Management is a "systematic approach for improving [natural] resource management by learning from management outcomes."[125] In the case of trading, an Adaptive Management framework would focus on: 1) improving trading program standards, protocols, and process; 2) generating and incorporating new information on Quantification Methods used to estimate Water Quality Benefits associated with individual BMPs[126]; and 3) evaluating whether water quality improvement actions have been effective at meeting overall water quality goals. An Adaptive Management framework would not be used as a mechanism for assessing individual permit compliance, although Adaptive Management findings could inform future permit iterations. Changes resulting from the Adaptive Management process might occur as part of a TMDL or Watershed analysis update, or as part of a permit renewal, but would not generally occur within a permit cycle.

11.1 Improving trading program standards, protocols, and process

[125] *See* U.S. Dep't of Interior, Adaptive Management: The U.S. Department of the Interior Technical Guide, at v, 1 (2009). *available at* http://www.usgs.gov/sdc/doc/DOI-%20Adaptive%20ManagementTechGuide.pdf ("Adaptive Management is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive Management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive Management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.").

[126] The incorporation of *new* BMPs and Quantification Methods is another component of program adaptation, but is considered separately in Section 1.6.

Programs can collect user feedback to improve ease of use and efficiency over time. The benefit of tracking this information is a system that works more smoothly for everyone. Updates may need to occur more frequently in early years, and less frequently as a program improves operations over time.

Draft Recommendation – Improving trading program management: *Each trading program should include an Adaptive Management Plan describing how the program will track and gather the information needed to improve program administration (e.g., protocols, operational processes, etc.) and note the interval for updating program documents (e.g., biennial or as needed). Program components that may be tracked include:*

- *Clarity of guidance and protocols: Can Project Developers, Verifiers, and other market participants clearly understand the operating procedures and standards that must be met?*
- *Ease of use of forms and systems for submitting documentation: What is the clearest and most efficient way to exchange needed information?*
- *Cost to deliver services: Are existing funding or fees sufficient to sustain needed service levels?*
- *BMP quality and performance standards: Are the right metrics being used? At the right levels? Are BMPs performing as expected?*

Commentary: none

11.2 Improving Quantification Methods

As they become available, agencies need mechanisms for incorporating new versions of models and other Quantification Methods into trading programs. These mechanisms will help to encourage the use of the most up-to-date science, consistency with the Regulatory process (i.e., water quality standards, TMDLs, permitting), and provide certainty for permittees and other market participants.

Draft Recommendation – Improving Quantification Methods*: Agencies manage the release of new versions for those Quantification Methods that they have created (e.g., models developed for a particular Watershed or for TMDLs in general). Upon acceptance of a new version of a Quantification Method, all new subsequent trading programs should use the new Quantification Method. Where acceptable to the permittee and the Regulatory agency, existing programs may choose to use the new version for subsequent project sites. While effort to incorporate new versions into existing trading programs should be made, all previously quantified projects will continue to use the Water Quality Benefit estimates derived from the model version that was in effect at the time the program began, unless the permittee and state agency choose to amend the relevant Regulatory requirements applicable to a site, or a material error or limitation is discovered in the originally used model version.*

Where there is a third party proponent for a Quantification Method, an Adaptive Management Plan, including protocols for version control and a monitoring plan that can support ongoing improvements to the method (e.g., calibration and Validation), should be submitted and approved by the state agency before the method is accepted for use in the trading program. Agencies may choose to discontinue acceptance of a method where the monitoring plan was not followed, technical analyses are not considered sufficient, or better methods have become available. Where review by agency staff is required, fees may be considered to recover agency costs.

Commentary: Models, effectiveness rates, and direct measurement methods to quantify Water Quality Benefit from BMPs are all based on our best-available, yet evolving understanding of natural system dynamics. Water quality trading projects provide an opportunity to generate the data that will improve Quantification Methods over time, but a trading program should consider which entity or entities will be responsible for setting up and conducting monitoring, and how improvements should be incorporated into Trading Guidance or programs.

Information needs will vary depending on the method being used. In order to improve Quantification Methods, it may be necessary to develop a robust sampling design and install sampling equipment at a number of sites. Considering the investment of time and equipment associated with this approach, methods are not likely to improve on their own. Some entity needs to take ownership of the management and improvement of Quantification Methods. Where application of a given Quantification Method is limited in scope or time, agencies may determine that it is not necessary to invest in monitoring and Adaptive Management.

In the event that new data reveals severe flaws in a Credit Quantification Methodology, agencies may need options to make adjustments to a Quantification Method within a permit cycle in order to minimize any adverse impacts to water quality.

11.3 Effectiveness Monitoring

Ultimately, many will want to know whether trading is fulfilling the obligations of Point Sources and whether water quality is improving. However, detecting changes in ambient water quality that are causally attributable to trading will often be difficult, if not impossible, especially in Watersheds where the impacts of Point Sources (i.e., those buying the Credits from trading projects) are relatively small compared to the overall issues in a waterbody. Nonetheless, as part of overall Watershed tracking, trading could be the impetus for establishing an Effectiveness Monitoring program, or could be wrapped into an overall TMDL Effectiveness Monitoring effort.

Draft Recommendation – Effectiveness Monitoring: *If not already part of a Watershed or TMDL monitoring strategy, trading participants may consider developing a multi-tiered, long-term*

Effectiveness Monitoring strategy that identifies and prioritizes the types of information needed to evaluate effectiveness at different stages of program implementation. Not all types of monitoring may be appropriate at each stage, and the data collection efforts associated with some measures of effectiveness may span several years before analysis is possible. Therefore, Effectiveness Monitoring should be appropriately tiered over time in relevant Regulatory documents, and should address increasingly more complex questions over time (e.g., the first permit focuses on confirming BMP implementation; the second focuses on prioritizing location and type of BMP; and the third begins linking BMP performance to overall status and trends in water quality, and improvements relevant to protecting beneficial uses).

An Effectiveness Monitoring strategy should include:

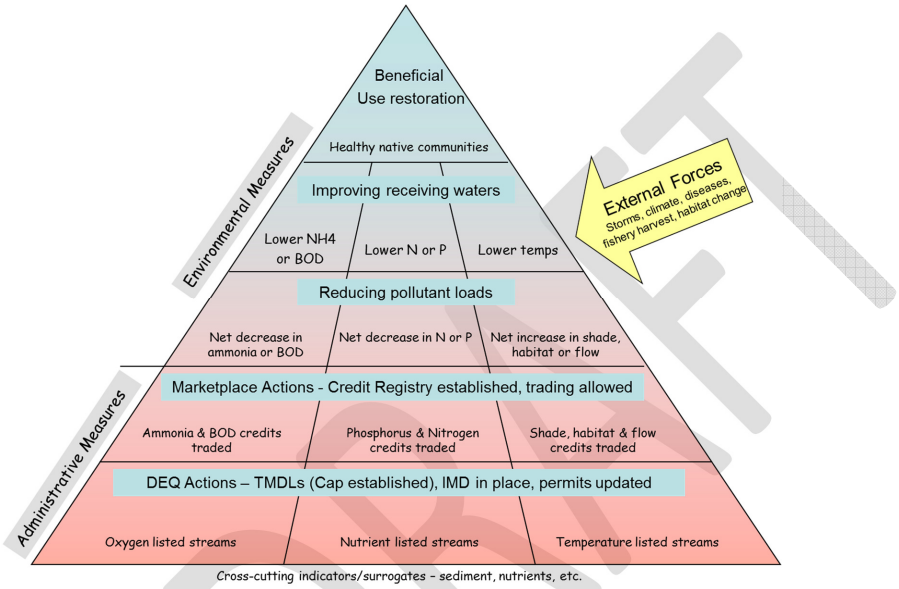
- *Identification of the evaluation questions that need to be answered for the overall Watershed, and for a trading program (i.e., is water quality being met, and what role is trading playing in that equation?);*
- *Identification of the different tiers of Effectiveness Monitoring, as well as the timing and metrics used to evaluate each tier;*
- *The data and data collection methods (both intensive and extensive methods) necessary to answer those questions; and*
- *A prioritization of data requirements and questions.*

Commentary: An Effectiveness Monitoring strategy should lay out a pyramid of metrics that can represent progress toward water quality standards and improving beneficial uses.

Figure 11.3 (provided by Oregon DEQ) is an example of a monitoring hierarchy, in which the program's ultimate goals—attainment of the water quality standard and support for the beneficial use—are at the top. A single trading program may not be able to achieve this ultimate goal, nor may it be possible to measure the impact of a trading program in isolation. However, the lower layers of the pyramid list surrogate measures that can be used as interim effectiveness benchmarks. Moving down the pyramid, the metrics become increasingly easy to measure relative to a given trading program, but increasingly removed from an understanding of whether the program is helping to achieve the beneficial use and attainment of water quality standards.

At trading sites, efforts should be made to establish pre-project conditions for all trading sites, as compared to post-project conditions (measured or anticipated) after full implementation of the trading program. This information may help to demonstrate progress throughout the Watershed. In addition to measuring reductions in loading and Regulatory compliance, trading program Effectiveness Monitoring should endeavor to track metrics related to marketplace actions, and beneficial uses.

Figure 11.3. Hierarchy of monitoring metrics. Source: Oregon DEQ



Effectiveness Monitoring is most likely to occur as part of a TMDL update or other Watershed monitoring system. Where states are not already undertaking TMDL or Watershed Effectiveness Monitoring, the additional study design, data collection, and analysis necessary to evaluate the impact of trading alone may be infeasible. Until the responsibility for this task is clearly delineated, Effectiveness Monitoring is unlikely to occur. Nonetheless, even though there are challenges and costs associated with Effectiveness Monitoring, it is essential for tracking progress toward water quality goals.

IV. Conclusion

The draft recommendations described in this document are intended to spark conversations about how trading programs can be built and operated to best achieve water quality goals and strike a fine balance between cost effectiveness, usability, and transparency. As this draft is completed, each of the states will work with stakeholders to test, discuss, and better refine these draft recommendations in a way that will best meet the needs of locales throughout the Northwest.

With the state agencies and EPA Region 10, Willamette Partnership and The Freshwater Trust hope to revisit these draft recommendations over the coming year and refine them to produce a proposed set of final recommendations for November 2014.

During the coming testing period, the group welcomes thoughts, comments, discussion, and suggestions on any one or all of these draft recommendations. Please direct feedback, questions, and comments to:

Carrie Sanneman
Ecosystem Service Project Manager
Willamette Partnership
sanneman@willamettepartnership.org
(503) 894-8426

DRAFT

V. Glossary

- **303(d) List**: the list of impaired and threatened waters (stream/river segments, lakes) that the Clean requires all states to submit for EPA approval every two years on even-numbered years.
- **401 Certification**: as described in 33 U.S.C. § 1341(a)(1), when a federal permit or license applicant plans to undertake any activity (including facility construction or operation) that may result in any discharge into navigable waters, it must obtain a 401 Certification. The Certification must come from relevant state, certifying that the discharge will comply with select provisions of the CWA.
- **Adaptive Management**: a systematic approach for improving natural resource management, with an emphasis on learning about management outcomes and incorporating what is learned into ongoing management.[127] Adaptive Management in water quality trading programs may focus on improving program operations, Quantification Methods, and overall program effectiveness.
- **Adaptive Management Plan**: need definition b/c we reference it as one of the many "plans" involved (we reference plans for Adaptive Management, Verification, monitoring/maintenance, trading)
- **Additionality**: In an environmental market, the environmental benefit secured through the payment is deemed additional if it would not have been generated absent the payment provided by the market system.[128]
- **Annual Compliance Report**: *See* (Report – Annual Compliance).
- **Anti-Backsliding**: as defined in CWA sections 303(d)(4) and 402(o), and 40 C.F.R. § 122.44(l), unless falling under a relevant exception, a reissued permit must be as stringent as the previous permit.[129]
- **Anti-Degradation**: as defined in 40 C.F.R. § 131.12, and relevant state rules and implementation guidelines., these policies ensure protection of existing uses and of water quality for a particular waterbody where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. Antidegradation also includes special protection of waters designated as outstanding national resource waters. Antidegradation plans are adopted by each state to minimize adverse effects on water.[130]
- **Attenuation (pollutant)**: the change in pollutant quantity as it moves between two points, such as from a point upstream to a point downstream.
- **Baseline (Trading)**: At a minimum, all individual Nonpoint Sources should meet Regulatory Baseline requirements. However, if a TMDL or general state Nonpoint Source authority exists, or a state wishes to impose a requirement that actions must be above a Nonpoint Source's status quo (Business As Usual) operations, a state can also choose to set its Trading Baseline at a level above Regulatory Baseline.

---

[127] *See* U.S. Dep't of Interior, Adaptive Management: The U.S. Department of the Interior Technical Guide, at v, 1 (2009). *available at* http://www.usgs.gov/sdc/doc/DOI-%20Adaptive%20ManagementTechGuide.pdf.

[128] Willamette Partnership, Ecosystem Credit Accounting System General Crediting Protocol Version 2.0 at Appendix B (Glossary) (2013)*, available at* http://willamettepartnership.org/ecosystem-credit-accounting/the-willamette-ecosystem-marketplace [hereinafter "Willamette Partnership, GCP 2.0"].

[129] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-1.

[130] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-2.

- **Baseline (Regulatory)**: The level of pollutant load associated with specific land uses and management practices that comply with stated requirements in applicable, state, local, or tribal regulations.[131] These regulations are typically affirmative obligations or non-disturbance regulations (e.g., all farms must have nutrient management plans in place, or riparian vegetation may not be actively disturbed).
- **Baseline (TMDLs)**: The level of pollutant reductions a TMDL expects specific land sectors to achieve. A Nonpoint Source's Baseline requirement "would be derived from the Nonpoint Source's [load allocation]."[132]
- **Baseline (General Authority)**: Some states may have general, broad authority to control Nonpoint Source pollution,[133] which can be used to influence Trading Baseline levels for a particular Watershed or trading program.
- **Baseline (Business-as-Usual)**: Some states may choose not to set Trading Baseline at a level that does not give Credit for BMPs that are already customary to the industry, or that were already planned because of immediate cost savings for the Nonpoint Source operator because these actions would have occurred without trading.[134]
- **Base Year**: the date after which implemented BMPs become eligible to generate Credits.
- **Best Management Practice (BMP)**: BMPs include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing management activities to reduce or eliminate the introduction of pollutants into receiving waters.[135] BMPs can consist of land management practices, and in-stream improvements (e.g., in-stream restoration actions, in-stream flow augmentation, etc.).
- **BMP Guidelines**: a document that defines: A) an approved Quantification Method, B) the appropriate pre-project site condition to use for calculating the reduction, C) installation and maintenance quality standards, and D) ongoing performance standards to ensure that each BMP is consistently achieving the desired water quality improvements.
- **Buyers**: Credit Buyers include any public or private entity that chooses to invest in water quality Credits and other like quantified conservation outcomes. Buyers typically buy Credits to meet a Regulatory obligation. Eligibility criteria for Buyers are described in Section 1 of the Draft Recommendations.
- **Calibration (modeling)**: adjustment of model parameters to better match local conditions, ideally using measured water quality data and BMP Site Performance metrics representative of the geographic area in which the model will be applied.

---

[131] *See* 2007 U.S. EPA Trading Toolkit, at 5.

[132] *See* 2007 U.S. EPA Trading Toolkit, at 29.

[133] *See, e.g.,* RCW 90.48.080 ("It shall be unlawful for any person to throw, drain, run, or otherwise discharge into *any of the waters of this state*) (emphasis added). Washington Dep't of Ecology authority to regulate Nonpoint Sources under this law was recently upheld by the Washington Supreme Court. Lemire v. Washington, No. 87703-3 (2013). Likewise, all dischargers are subject to regulation under California state law. Cal. Water Code § 13260(a)(1). On the other hand, the federal CWA definition of "Point Source" specifically excludes "agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. § 1362(14).

[134] Willamette Partnership, GCP 2.0, at App. B Glossary.

[135] 2007 U.S. EPA Trading Toolkit, at Glossary-2.

- **Clean Water Act (CWA)**: 33 U.S.C. § 1251 et seq.
- **Certification**: the formal application and approval process of the Credits generated from a BMP. Certification is after Verification, it is the last step before Credits can be used toward a Compliance Obligation.
- **Compliance Obligation**: the total number of Credits that a regulated entity must hold in its compliance ledger at particular points in time. In the case of NPDES permittees, this obligation is based on a calculation as to the facility's Exceedance over its Effluent Limit, as adjusted by a Trading Ratio, (and where applicable, other policy obligations, such as a Reserve Pool requirement),.
- **Compliance Schedule**: as defined in 33 U.S.C. § 1362(17), and 40 C.F.R. § 122.47, a Compliance Schedule is a schedule of remedial measures included in a permit or an enforcement order, including a sequence of interim requirements (e.g., actions, operations, or milestone events) that lead a permittee to compliance with the Clean Water Act and regulations.[136]
- **Credit**: A measured or estimated unit of pollutant reduction per unit of time at a specified location.[137]
- **Credit Contract Period**: the duration of a contract between a Regulated Entity and a Project Developer.
- **Credit Life**: the period from the date a Credit becomes usable as an offset by a permittee (i.e., its "effective" date), and the date that the Credit is no longer valid (i.e., its "expiration" date).
- **Credit Registry**: a service or software that provides a ledge function for tracking Credit quantities and ownership. Credit registries may also act as a mechanism for public disclosure of trading project documentation.
- **Credit Stacking**: *See* Stacking (Credit).
- **Critical Period**: the period(s) during which hydrologic, temperature, environmental, flow, and other conditions result in a waterbody experiencing critical conditions with respect to an identified impairment.
- **Delivery Ratio**: *See* Trading Ratio (Delivery).
- **Designated Management Agencies (DMA)**: as defined in 40 C.F.R. § 130.2(n), an agency identified by a water quality management plan and designated by a state to implement specific control recommendations.
- **Designated Uses**: as defined in 40 C.F.R. § 131.3(f) and 40 C.F.R. § 131.10, Designated Uses are those uses specified in water quality standards for each water body or segment whether or not they are being attained. As defined in 40 C.F.R. § 131.10(a), examples of Designated Uses include public water supply, protection and propagation of fish, shellfish, and wildlife, recreation, agriculture, industrial, and navigation.
- **Designee**: a person or entity who has been officially chosen to do something or serve a particular role.
- **Direct Monitoring:** *See* Quantification Method (Direct Monitoring)
- **Discharge Monitoring Report**: a periodic water pollution report prepared by Point Sources discharging to surface waters of the United States and the various states. Point Sources collect wastewater samples, conduct chemical and/or biological tests of the samples, and submit reports to a state agency or the U.S. Environmental Protection Agency (EPA).

---

[136] *Id.*

[137] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-2.

- **Discharge Point**: the point at which a Point Source adds/discharges a pollutant (as defined in 33 U.S.C. § 1362(6)) into a navigable water, which is defined in 33 U.S.C. § 1362(7)). A discharge of a pollutant is defined in 33 U.S.C. § 1362(12).
- **Effectiveness Monitoring**: systematic data collection and analysis to determine progress of a given water quality trading program toward the achievement of water quality standards or other program goals. Effectiveness Monitoring provides the basis for Adaptive Management.
- **Effluent Limit**: as defined in 33 U.S.C. § 1362(11), an Effluent Limit means any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from Point Sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance. *See also* Water Quality-Based Effluent Limit (WQBEL), and Technology-Based Effluent Limit (TBEL).
- **Equivalency Ratio**: *See* Trading Ratio (Equivalency).
- **Exceedance**: the difference between a facility's load discharge, and its Effluent Limit.
- **Load Allocation (LA)**: as defined in 40 C.F.R. § 130.2(g), this is the portion of a receiving water's loading capacity that is attributed either to one of its existing or future Nonpoint Sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and Nonpoint Source loads should be distinguished.
- **Location Ratios**: *See* Trading Ratios (Delivery).
- **Look-Back Period**: the time period preceding the implementation of a permittee's Trading Solution during which landowners may take credit for installed BMPs. A Look-Back Period is intended to adjust for a market failure that disincentivizes early action by landowners.
- **Material**: a significant but unintentional error that affects the costs or benefits expected in a transaction.[138]
- **Mixing Zone**: as authorized by 40 C.F.R. § 131.13, and implemented according to state law, the area where wastewater discharged from a permitted facility enters and mixes with a stream or water body. A Mixing Zone is an established area where water quality standards may be exceeded as long as acutely toxic conditions are prevented and all beneficial uses, such as drinking water, fish habitat, recreation, and other uses are protected.
- **National Pollutant Discharge Elimination System (NPDES) Permit**: as defined in 33 U.S.C. § 1342.
- **Near-Field Regulations**: minimum federal and state regulations that a permitted facility must meet at its Discharge Point in order to be eligible to engage in water quality trading.
- **Nonpoint Source**: Nonpoint Sources are diffuse sources of water pollution, such as stormwater and nutrient runoff from agricultural or forest lands. *See* 40 C.F.R. § 35.1605-4. EPA guidance describes a "Nonpoint Source" as "includ[ing] pollution caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters, and ground water. Atmospheric deposition and hydrologic modification are also sources of Nonpoint pollution."[139]

---

[138] American Bar Ass'n, Contract Drafting, at 284 (2010).

[139] EPA, Nonpoint Source Program and Grants Guidelines for States and Territories, at 7 n.2 (2013), *available at* http://water.epa.gov/polwaste/nps/upload/319-guidelines-fy14.pdf.

- **Offset**: 1) *(noun)* Offsite treatment implemented by a regulated Point Source on upstream land not owned by the Point Source for the purposes of meeting its permit limit; 2) *(noun)* Load reductions that are purchased by a new or expanding Point Source to offset its increased discharge to an impaired waterbody. *(Note: EPA considers both types of offsets to be trading programs)*; 3) *(verb)* to compensate for.[140]
- **Open Enrollment Period**: the time during which early-adopter landowners who installed BMPs during the appropriate Look-Back Period, but do not yet have sufficient data to qualify for new trading program eligibility standards, can enroll their Credits in the program, pending compilation of appropriate documentation during a probationary period.
- **Payment Stacking**: *See* Stacking (Payments).
- **Permit Evaluation Report**: a supplementary document where additional rationale and discussion may be included in support of a NPDES permit.
- **Photo Point Monitoring**: the practice of taking and collecting photos from the same locations within a Project Site to document changes in Project Site conditions over time.
- **Point of Maximum Impact (Point of Concern)**: the point at which the greatest deviations from a particular water quality standard occurs, as identified through appropriate Watershed-wide modeling.
- **Point Source**: as defined in 33 U.S.C. § 1362(14), this means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.
- **Project Site Assessment**: the process of developing and documenting the information necessary to input the needed data into Water Quality Benefit Quantification Methods. This may include a site visit and/or interpretation of remote data.
- **Program Administrator (Market Administrator)**: the organization responsible for the operation and maintenance of a water quality trading program or ecosystem Credit accounting system. Specific responsibilities of a Program Administrator may include: defining Credit calculation methodologies, protocols and quality standards; project site Verification; and Credit registration.[141]
- **Project Design**: the document that details how the proposed Credit-generating action will be installed to meet BMP Guidelines, including a description of the proposed actions, installation practices, anticipated timelines, restoration goals, and anticipated threats to project performance.
- **Project Management Plan**: the document that details how the Project Developer plans to maintain the practice or action for the duration of the Project Life, and how the Project Developer plans to keep the practice or action consistent with BMP Guidelines**.**
- **Project Developer**: any entity that develops Credits, whether that entity is the permittee, a contractor of the permittee that develops or aggregates Credits, or a landowner developing Credits on a permittee's behalf.
- **Project Life**: the period of time over which a given BMP is expected to generate Credits. Typically, the Project Life is also the minimum Project Protection Period.

---

[140] 2007 U.S. EPA Trading Toolkit, at Glossary-4.

[141] Willamette Partnership, GCP 2.0, at App. B Glossary.

- **Project Protection Agreements**: the enforceable agreements to protect BMPs at the Project Site, which may include leases, contracts, easements, or other agreements. Project Protection Agreements must cover the Credit Life and should run with the land to ensure the project will not be affected if ownership changes. Ideally, these protections will also mitigate against proximate disturbing land use activities.
- **Project Protection Period**: the duration of the Project Protection Agreement, which at a minimum must cover the Credit Life.
- **Project Site**: the location at which BMPs are undertaken or installed.
- **Proportional Accounting**: the generation of multiple Credit types where a Project Site performs more than one distinct environmental benefit on non-spatially overlapping areas.[142] Although multiple Credit values are produced, the sale of one Credit has a corresponding reduction in the proportion of all other Credits.
- **Protocols**: step-by-step manuals and guidelines for achieving particular environmental outcomes. Protocols include the actions, sequencing, and documentation necessary to generate Credits from a eligible BMPs.
- **Public Funds Dedicated to Conservation**: funding targeted to support voluntary natural resource protection and/or restoration with a primary purpose of achieving a net ecological benefit through creating, restoring, enhancing, or preserving habitats.[143] Some examples include Farm Bill Conservation Title cost share and easement programs, EPA section 319 funds, U.S. Fish and Wildlife Service Partners for Wildlife Program, state wildlife grants, and other sources. Public loans intended to be used for capital improvements of public water systems (e.g., State Clean Water Revolving Funds and USDA Rural Development funds), and utility stormwater and surface water management fees, are not Public Funds Dedicated to Conservation.[144]
- **Quality Standards**: the necessary specifications associated with a particular Credit-Generating Activity or BMP that ensures that the estimated ecosystem service benefits at a Project Site are actually achieved through implementation.
- **Quantification Method**: scientifically-based method for determining the load reduction associated with a given Credit-Generating activity or BMP. Quantification Methods can be grouped into three general types: pre-determined rates/ratios, modeling, and Direct Monitoring.
- **Quantification Method (Predetermined Pollution Reduction Rates)**: standard modeled values based on the best available science that is used to calculate water quality improvement.
- **Quantification Method (Modeling)**: mathematical and/or statistical representation of processes driving changes in water quality, based in science, used to estimate the Water Quality Benefits provided by the Credit-Generating Activities. Modeling is also frequently used to predict Attenuation of pollutants.

---

[142] *Id.* at 3.2.1.

[143] *See* U.S. Fish & Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Watershed Enhancement Board, Oregon Department of Fish and Wildlife, Oregon Interagency Recommendations: Public Funds to Restore, Enhance, and Protect Wetland and At-Risk, Threatened and Endangered Species Habitats: Appropriate Uses of These Funds in Species and Wetland Mitigation Projects (2008), *available at* http://www.fws.gov/oregonfwo/LandAndWater/Documents/PublicFunding-final.pdf.

[144] Willamette Partnership, GCP 2.0, at App. B Glossary.

- **Quantification Method (Direct Monitoring)**: sampling and analysis of both water chemistry (e.g., river turbidity or temperature) and surrogates for water quality (e.g., eroding stream banks or shade from riparian vegetation) used to measure the realized Water Quality Benefits of BMPs and Credit-Generating Activities.
- **Reference Conditions**: local conditions that inform BMP and Credit-Generating Activity quality standards at a particular project site. Reference sites establish the benchmark for ecologically healthy site(s) within the same Watershed (HUC5), and are based on historical conditions, literature, local knowledge, and/or the best professional judgment.
- **Registration (of Credits)**: the process of assigning a unique serial number to a verified and certified Credit, and uploading the Credit (and accompanying documentation) to a publicly available website.
- **Registry (Credit)**: *See* Credit Registry
- **Regulated Entities**: entities regulated under the Clean Water Act. Typically, these entities are regulated via permits.
- **Regulator**: the state and federal agencies responsible for protecting environmental quality/permit issuance.
- **Regulatory Baseline**: *See* Baseline (Regulatory)
- **Report (Annual Compliance)**: annual reports that aggregate the details of individual Site Performance reports into a comprehensive summary of overall Trading Plan performance. These reports may be required as special conditions in permits.
- **Report (Site Performance)**: reports detailing the performance of installed BMPs at individual project sites. These reports are not usually required as special conditions in permits.
- **Reserve Pool**: A collection or bank of unused Credits that is available to compensate for unanticipated shortfalls in the quantity of Credits that are actually generated.[145]
- **Retirement Ratio**: *See* Trading Ratio (Retirement).
- **Site Screening**: *See* Validation.
- **Supplemental Environmental Project (SEP)**: an environmentally beneficial project that a violator voluntarily agrees to perform as part of a settlement of a civil penalty to offset some portion of the monetary penalty. In return, EPA agrees to reduce the monetary penalty that would otherwise apply as a result of the violation(s). SEPs are guided by several factors, as described in *Memorandum from Steven Herman, Assistant Administrator, U.S. EPA, to Regional Administrators, Issuance of Final Supplemental Environmental Projects Policy (1998).*
- **Site Conditions (Post-Project)**: the characteristics and conditions of the project site that are measured or are anticipated to be present after the implementation of a BMP or action and assuming the project site continues to be managed as planned.
- **Site Conditions (Pre-Project)**: a description of site condition prior to implementation of the BMP action, used to calculate the current input level of a pollutant (in default unit of trade) from the project site into the waterbody.[146]
- **Site Performance (Post-Project)**: the pollutant load (measured or anticipated) that will enter a waterway, as calculated by the relevant Quantification Method's interpretation of post-project conditions.

---

[145] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

[146] Willamette Partnership, GCP 2.0, at App. B Glossary.

- **Site Performance (Pre-Project)**: the modeled pollutant load that is entering a waterway, as estimated by the relevant Quantification Method, from a site prior to installing a BMP or action.
- **Site Performance Report**: *See* (Report – Site Performance).
- **Stacking (Credit)**: the generation and sale of more than one kind of Credit from the same action on the same area of land, at the same time.[147]
- **Stacking (Payments)**: the use of multiple funding sources to support a Credit-generating project. Payment Stacking is most often discussed and addressed through water quality trading programs when the one or more funding sources are Public Funding Dedicated to Conservation.
- **Stewardship Funds**: the funding necessary to maintain Project Sites for the duration of the Credit Life. Project Developers must demonstrate adequate stewardship funding is in place before Credits can be verified. Stewardship funding instruments often include performance bonds, restricted accounts, insurance, etc.
- **Technology-Based Effluent Limit (TBEL)**: as described in 33 U.S.C. § 1311(b)(1)(A)-(B), a permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for publicly owned treatment works (POTWs) are derived from the secondary treatment regulations (40 CFR Part 133) or state treatment standards. TBELs for non-POTWs are derived from national Effluent Limitation Guidelines, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.[148]
- **Total Maximum Daily Load (TMDL)**: as defined in 33 U.S.C. § 1313(d)(1)(C), and 40 C.F.R. §§ 130.2(i), as well as in relevant state regulations. A TMDL is the calculation of the maximum amount of a pollutant a waterbody can receive and still meet applicable water quality standards (accounting for seasonal variations and a margin of safety), including an allocation of pollutant loadings to Point Sources (wasteload allocations) and Nonpoint Sources (load allocations).[149]
- **TMDL Implementation Plans**: the management plans designed by Designated Management Agencies to implement the wasteload and load allocations assigned to entities in the TMDL.
- **Toxics**: persistent bio-accumulative Toxics (PBTs). PBTs are chemicals that are toxic, persist in the environment and bioaccumulate in food chains and, thus, pose risks to human health and ecosystems. PBTs include aldrin/dieldrin, benzo(a)pyrene, chlordane, DDT and its metabolites, hexachlorobenzene, alkyl-lead, mercury and its compounds, mirex, octachlorostyrene, PCBs, dioxins and furans, and toxaphene.[150]
- **Trading Guidance**: state- or federal-level policy or rules on trading.
- **Trading Framework**: the Watershed-level documents that house the details of trading processes and standards.
- **Trading Plan or Solution**: permittee-level trading details.

---

[147] *Id.* at 3.2.1.

[148] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1612.

[149] *See* 2007 U.S. EPA Toolkit, at Glossary-5.

[150] 2003 U.S. EPA Trading Policy, 68 Fed. Reg. at 1610 (EPA did not originally support trading of persistent bioaccumulative Toxics). Notable PBTs are prioritized by EPA's Canada-United States bi-national Toxics strategy. *See* EPA, Multimedia Strategy for Priority Persistent, Bioaccumulative, and Toxic (PBT) Chemicals, http://www.epa.gov/pbt/pubs/fact.htm.

- **Trading Ratio**: a Trading Ratio is a numeric value that is multiplied by the number of Credits that would otherwise be required (i.e., the amount of Water Quality Benefits reduced by Baseline obligations). Ratios are applied to account for various factors, such as Watershed processes (e.g., Attenuation), risk, and uncertainty— both in terms of measurement error and project performance, ensuring net environmental benefit, and/or ensuring equivalency across types of pollutants. Ratios are applied to the final calculated Credit amount.
- **Trading Ratio (Delivery)**: the factor applied to pollutant reduction Credits when sources are directly discharging to a waterbody of concern that accounts for the distance and unique Watershed features (e.g., hydrologic conditions) that will affect pollutant fate and transport between trading partners.[151]
- **Trading Ratio (Equivalency)**: the factor applied to pollutant reduction Credits to adjust for trading different pollutants or different forms of the same pollutant.[152]
- **Trading Ratio (Retirement)**: the factor applied to pollutant reduction Credits to accelerate water quality improvement. The ratio indicates the proportion of Credits that must be purchased in addition to the Credits needed to meet regulatory obligations. These excess Credits are taken out of circulation (retired) to accelerate water quality improvement.[153]
- **Trading Ratio (Reserve)**: a type of uncertainty ratio in which Credits are held in "reserve" and then used to account for uncertainty and offset failures in project performance.
- **Trading Ratio (Uncertainty)**: the factor applied to pollutant reduction Credits generated by Nonpoint Sources that accounts for lack of information and risk associated with BMP measurement, implementation, and performance.[154]
- **Units of Trade**: the quantity of tradable pollutants, typically expressed in terms of pollutant load per unit time, at a specified location (e.g., lbs/year at the point of concern).
- **Validation (Site Screening)**: the initial site-screening process through which a Project Developer receives confirmation that their proposed project is likely eligible to produce Credits, based on the information available at that time.
- **Validation (modeling)**: the process through which results from Credit Quantification Methods are assessed relative to evaluation criteria. Often, Validation includes the comparison of model results with measured data, sensitivity analyses, and uncertainty analyses. Validation may also include a comparision with other model outputs, literature values, and/or expert judgement.
- **Variance**: as authorized by 40 C.F.R. § 131.13, and implemented according to state law, a Variance is a time-limited change in the water quality standards for a particular Regulated Entity, typically limited to three-to five-year duration, with renewals possible.
- **Verification**: confirmation that Project Site BMPs or Credit-Generating Activities and Credits conform to the applicable quality standards required by a Program Administrator or Regulator. This process includes: (1) on-the-ground statistical or scientific corroboration of the Project Developer's asserted Credit-Generating Activities or BMPs by an independent, third party; (2) review, inspection, or audit of the Project Developer's Credit generation processes or models; (3) review of associated

[151] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-3.

[152] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-3.

[153] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-5.

[154] *See* 2007 U.S. EPA Trading Toolkit, at Glossary-6.

Project Protection Agreements, or other documents to ascertain Credit ownership and duration; and (4) ongoing review of reports or models, as specified over time, to confirm that the project is performing to the applicable standards.

- **Verification Entities**: a state regulatory body, a qualified third party, or a permittee.
- **Verification Protocol**: the document that provides the standardized, specific guidance on the review and assessment of Credit-Generating Actions and BMPs and Credit calculation methodologies under a water quality trading program (adapted from GCP).
- **Waste Load Allocation (WLA)**: as defined in 40 C.F.R. § 130.2(h), this is the portion of a receiving water's loading capacity that is allocated to one of its existing or future Point Sources of pollution. WLAs constitute a type of water quality-based Effluent Limitation.
- **Water Quality Benefit**: the environmental improvement directly attributable to BMPs installed at a site. Determining Water Quality Benefit is the first step in for determining the Credits available for sale (it must be reduced by applicable Attenuation or modeling factors, Baseline factors, ratios, etc.). Water Quality Benefit is calculated by subtracting the modeled post-project performance from the modeled pre-project performance.
- **Water Quality Criteria**: as defined in 40 C.F.R. § 131.3, WQC are elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.
- **Water Quality Standard**: as defined in 40 C.F.R. § 131.3(i), Water Quality Standards are provisions of state or federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act.
- **Water Quality Based-Effluent Limitation (WQBEL)**: as described in 33 U.S.C. § 1312(a), a TBEL is an Effluent Limitation determined by selecting the most stringent of the Effluent Limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific Point Source to a specific receiving water for a given pollutant or based on the facility's wasteload allocation from a TMDL.
- **Water Quality Model**: *See* Quantification (Water Quality Model).
- **Watershed**: an area of the land that drains to a common lake, pond, river, stream, or other surface waters of the State that is delineated for the purpose of instituting water quality management activities.[155]

[155] Wisconsin Department of Natural Resources, Guidance for implementing water quality trading in WPDES permits, No. 3800-2013-04, at Glossary (2013), *available at* http://dnr.wi.gov/topic/surfacewater/documents/WQT_guidance_Aug_21_2013signed.pdf.

VI. Appendix A. Components of BMP Guidelines

Category		Components
Basic Information		• Title and description of practice • Load sources addressed by BMP

Quantification Method		• Unit of measure
		• Quantification approach and/or tool
		  ○ Technical documentation of quantification approach/tool, including assumptions and estimates of uncertainty
		  ○ Procedures/user guidance for consistent application of the method
		• Alternative quantification approach and/or tool
		• Effectiveness estimate, including justifications/references

BMP Quality Standards	Suitability/ Specific BMP Eligibility	• Eligible land-uses and practices • Locations in Watershed where BMP is applicable • Potential interactions with other practices (e.g., riparian restoration with stream fencing increases combined effectiveness) • Identification of ancillary benefits or unintended consequences (e.g., increased/reduced air emissions) • Description of conditions where the BMP will not work (i.e., large storms) • Any negative results (e.g., relocated pollutants, negative pollutant reduction data)

	Design criteria	• Installation instructions/guidance (e.g., installation according to manufacturer standards and/or NRCS standards)
		• Verifiable criteria for installation, including:
		  ○ Quantitative criteria (e.g. 2600 stems/acre planting density, 100 ft minimum buffer width, 30% residual residue, 2 hour inflow water capacity, 100 ft. from surface water, etc.)
		  ○ Qualitative criteria for installation (e.g. watering hole outside riparian zone, fence/pipe material type, etc.)
		• Management instructions/guidance (e.g., seeding rate, tillage plan, crop list, water application rates and method,

DRAFT

		fertilizer application rates and methods)
	Monitoring	• Operation and maintenance requirements and how neglect alters performance • Description of how the practice will be tracked and reported, e.g. noting signs of erosion, measurement of vegetative cover, monitored irrigation systems.
	Performance standards	• Verifiable criteria for performance, e.g. no rills or gullies wider than 6", stem density of 1600 stems per acre or greater, no more than 20% cover invasive species, at least 10 inches crop stubble height
Credit Issuance Procedures	Project Protection Agreement Duration and Credit Disbursement	• Cumulative, annual, or seasonal practice • Useful life; effectiveness of practice over time • Factors affecting temporal performance of the practice, including lag time between establishment and full functioning
	Site Screening	• Documentation that must be submitted to determine eligibility during a project screening/Validation • Procedures for reviewing consistency with eligibility criteria • Applicable Baseline requirements
	Credit Calculation Procedures	• Guidelines for applying methodology to pre-project Site Conditions • Guidelines for defining/predicting the future condition (for BMPs that take time to mature) • Guidelines for documenting assumptions and data included in quantifying Water Quality Benefits.

DRAFT

	Verification	• Procedures for documenting pre- and post-project conditions (e.g., farm records for 3 years prior, photo points documenting pre-project condition, site visit after installation) • Procedures for reviewing consistency of pre- and post-project conditions with quality standards (e.g., no more than 15% discrepancy between reported and verified values)

DRAFT