Discussion Paper: Considerations for Interstate Trading and Offsets in the Chesapeake Bay Watershed

Water Quality Trading and Offsets

U.S. EPA Region 3 Water Protection Division

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Contents

PURPOSE

The purpose of this paper is to raise various issues to be considered by jurisdictions and stakeholders in the Chesapeake Bay watershed interested in exploring or establishing a program for the use of trading and/or offsets across state boundaries. The paper is only intended to be a starting point for discussion(s) on the issue of interstate trading. It is not a technical memorandum and does not set forth EPA expectations, policy, or guidance.

Given that states' trading programs significantly differ across the Chesapeake Bay watershed, in which some jurisdictions have no trading programs, this discussion paper is premised on the assumption that interstate trading would require some minimal level of agreement or coordination to address these differences.

KEY DEFINITIONS

Public uncertainty over basic definitions, no matter how seemingly subtle the uncertainty may be, could lead to material misunderstanding of the actual policy or applicability and, unfortunately act as a deterrent to interstate trades. As a result, to realize the potential gains of interstate trading, one or more jurisdiction may need to accept a different definition of some key terms if only in the context of interstate trades.

Below are definitions of "credits" and "offsets" provided by Delaware, Maryland, Pennsylvania, and Virginia, as well as the 2010 Chesapeake Bay TDML. These examples demonstrate that, whereas the definitions of "credit" are in large part consistent with one another, the definitions of "offset" differ significantly among the states; the main difference has to do with the role of offsets in relation to new or expanding sources.

Delaware[1]:

> "Offset" means an alternate mechanism to meet the regulations including, but not limited to fees-in-lieu, trading, and mitigation.
>
> Note: Delaware does not have a definition of credit.

Maryland[2]:

> Credit or Pollutant Reduction Credit: A measured or estimated unit of pollutant reduction per unit of time at the discharge location that can be generated and sold or exchanged in a trade A credit

[1] Section 1.7 of the Delaware Sediment and Stormwater Regulations (DSSR) and referred to in subsequent Sections 5.2.3.2.2 and 5.6.3.2.2.

[2] MDE and MDA, 2017. Maryland Trading and Offset Policy and Guidance Manual Chesapeake Bay Watershed. 4.17.17 Update.

is generated by load reductions that are greater than those required of the credit generator by a regulatory requirement or established under a TMDL, a.k.a. baseline. The resulting credits are expressed as mass per unit time (e.g. pounds per year for TN and TP, or in the case of TSS, tons per year) adjusted to account for applicable trading ratios.

Offset: 1.) n. Offsite treatment implemented by a regulated point source for the purposes of meeting its permit limit. 2.) n. Load reductions that are acquired by a new or expanding point source from other point sources, and/or nonpoint sources, or load reductions obtained through the transfer of flow from an OSDS to an ENR facility to offset the new point source discharge within an impaired watershed, such as the Chesapeake Bay or a local tributary. 3.) v. to compensate for increased loads beyond the facility's loading baseline.

Pennsylvania[3]:

Credit: The tradable unit of compliance that corresponds with a unit of reduction of a pollutant as recognized by DEP which, when certified, verified and registered, may be used to comply with NPDES permit effluent limitations.

Offset: The pollutant load reduction measured in pounds (lbs) that is created by an action, activity or technology which, when approved by DEP, may be used to comply with NPDES permit effluent limitations, conditions, and stipulations under 25 Pa. Code Chapter 92a (relating to NPDES permitting, monitoring and compliance). The offset may only be used by the NPDES permittee that DEP determines is associated with the load reduction achieved by the action, activity, or technology.

Virginia[4]:

"Nutrient credit" or "credit" means a nutrient reduction that is certified pursuant to this chapter and expressed in pounds of phosphorus and nitrogen either (i) delivered to tidal waters when the credit is generated within the Chesapeake Bay Watershed or (ii) as otherwise specified when generated in the Southern Rivers watersheds. Nutrient credit does not include point source

[3] Credit defined in Pennsylvania is from: Phase 2 Watershed Implementation Plan Nutrient Trading Supplement (Revised, February 2016). Available at http://files.dep.state.pa.us/Water/BPNPSM/NutrientTrading/NutrientTradingSupplementToPhase2WIP.pdf. Offset defined from PA's Nutrient Trading Regulations at: 025PA code 96.8.

[4] The definitions of "nutrient credit", "credit", and "point source nitrogen credit" are from: Act of March 24, 2005, ch 62.1, §§ 62.1-44.19:12 through 62.1-44.19:23, 2005 Va. Acts Chesapeake Bay Watershed Nutrient Credit Exchange Program (establishing nutrient trading program). Available at http://law.lis.virginia.gov/vacodefull/title62.1/chapter3.1/article4.02/. The definition of "offset" is from: General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for TN and TP Discharges and Nutrient Trading in the Chesapeake Bay watershed in Virginia, 9 VAC 25-820-10 et seq. Available at http://law.lis.virginia.gov/report/Gk53Q

nitrogen credits or point source phosphorus credits as defined in § 62.1-44.19:13 of the Code of Virginia.

"Point source nitrogen credit" means the difference between (i) the waste load allocation for a permitted facility specified as an annual mass load of total nitrogen and (ii) the monitored annual mass load of total nitrogen discharged by that facility, where clause (ii) is less than clause (i), and where the difference is adjusted by the applicable delivery factor and expressed as pounds per year of delivered total nitrogen load.

"Offset" means to acquire an annual waste load allocation of total nitrogen or total phosphorus by a new or expanding facility to ensure that there is no net increase of nutrients into the affected tributary of the Chesapeake Bay.

2010 Chesapeake Bay TMDL:

Credit. For purposes of the Chesapeake Bay TMDL, means a measured unit of nitrogen, phosphorus, or sediment pollutant reduction per unit of time at a location designated and standardized by the jurisdiction that can be generated, sold, or traded as part of an offset.

Offset. For purposes of the Chesapeake Bay TMDL, means (n.) a reduction in the loading of a pollutant of concern from a source or sources that is used to compensate for the loading of the pollutant of concern from a different point or nonpoint source in a manner consistent with meeting WQS; or (v.) compensating for the loading of a pollutant of concern from a point or nonpoint source with a reduction in the loading from a different source or sources, in a manner consistent with meeting WQS.

INTER-BASIN VERSUS INTRA-BASIN INTERSTATE TRADING

Interstate trading may take the form of intra-basin (e.g., WV-Potomac and VA-Potomac), and perhaps inter-basin (e.g., PA-Susquehanna and MD-Potomac). Only three of the eight major river basins in the Chesapeake Bay watershed span more than one jurisdiction and, thus, are likely candidates for intra-basin trading: Susquehanna (NY, PA, MD), Potomac (DC, MD, PA, VA, WV), and Eastern Shore (DE, MD, PA, VA). The other five basins are located primarily within one jurisdiction. These five are Western Shore (99% MD, PA), Patuxent River (MD), Rappahannock River (VA), York River (VA), and James River (99% VA, WV).

Inter-basin trading may be possible in the Chesapeake Bay watershed for basins where there is room for load exchanges between basins as long as there is a demonstration that the water quality standards would still be met. Applicability would be influenced by the locations of buyers and sellers as they effect attenuation, the need to account for the fact each basin impacts Bay water quality differently, local water quality impacts, retirement ratios and so forth.

DEFINING THE NEED AND/OR GOALS FOR INTERSTATE TRADING

There may be advantages to interstate trading be it inter-basin or intra-basin, some based on solving a specific need and others based on a desired outcome or goal. These might include:

- To balance supply and demand. Examples might include large credit sellers that wish to broaden the pool of potential buyers, or interest by geographically isolated credit buyers whose closest potential sellers are located across a state line.
- To increase the competitiveness of the market thus mitigating "market power." This example is related to balancing supply and demand above. The specific concern here is not only that the pool of sellers might be small for example, but as result they might be positioned to control or dominate market conditions to their advantage.
- To increase economic efficiency. For example, Van Houtven et al. (2012) estimated that allowing interstate trading (constrained to intra-basin trading such as within Potomac River) would increase the potential cost savings from nutrient credit trading for large point sources in the Bay watershed by over 20 percent as compared to not allowing interstate trading.
- To reduce the overall administrative costs of trading programs by avoiding duplication of certain functions. For example, a multistate trading system could use a single unified system for certifying, registering, and tracking credits. Efforts in this direction are discussed in the last section.

There also may be disadvantages, such as:

- Interstate trading may require increased staff time for coordination among state agencies.
- Reticence to spending local ratepayer funds on credits generated in a different jurisdiction.
- Expanding the scale of the market can change the spatial pattern of load reductions, which might raise local water quality concerns.
    - In cases where local water quality concerns are perceived but not real, achieving public support for such trades could increase the cost and time to do so.
    - In cases where local water quality concerns are real, such risks can be addressed by geographically limiting where credits can be bought and sold, which itself could limit the advantages sought with interstate trading in the first place.
- Interstate trading can also shift the costs and benefits as compared to not allowing interstate trading. For example, some areas may experience increased or decreased levels of conservation than otherwise. Interstate trading could also make some credits relatively more or less competitive than otherwise due to increased market size and competition, which in turn can shift advertised prices.
- The sheer uncertainty and unfamiliarity about best steps for interstate trading and all the information and knowledge needed to understand such steps could itself outweigh a party's willingness to initiate or participate in discussion.

One such example of intra-basin interstate trading was Jefferson County Public Service District's (WV-Potomac) arrangement to purchase agricultural nonpoint source credits from Pennsylvania (PA-

Potomac). Since West Virginia did not have its own trading program, there was interest in finding credits in another state. In this case, the Interstate Commission on the Potomac River Basin (ICPRB), which is an advisory and non-regulatory compact among the five jurisdictions in the Potomac basin, had agreed to voluntarily verify and certify the validity of the credits for West Virginia. Although the construction of the new plant ultimately was not approved and therefore the need for trading did not materialize, arrangements for the interstate trade had been made.

LINKING EXISTING BUT SEPARATE STATE PROGRAMS

The overall approach to link trading across two jurisdictions could range from simple to complex, as needed. Relevant lessons can be drawn from other environmental markets, one being the coordination of existing programs designed to address greenhouse gas emissions, and its growing literature exploring how to address needed linkages. The literature often distinguishes among unilateral, bilateral, and multilateral approaches (Tuerk et al., 2009).

Under a **unilateral** approach, essentially all trades are one-way trades. The administrator of State A's program for example could establish rules and procedures for accepting load reductions and/or credits generated in State B. Had the Jefferson County example resulted in a trade, it would have been a very simple unilateral arrangement. The unilateral approach does not necessarily involve any explicit reciprocity or coordination between the two state programs, thus State B does not necessarily need to reciprocate by accepting credits from State A. The unilateral approach has the advantage of being relatively easy to implement; presumably, to fill a very narrow need. It also gives the implementing authority more flexibility and control in managing the terms of cross-boundary trade (Hawkins and Jegou, 2014).

Under a **bilateral** approach, two programs establish an agreement that allows for credits to be traded in both directions between their programs. An advantage of the bilateral approach is that it potentially provides more stability and certainty for program participants because a bilateral approach typically would entail more formal and explicit agreements regarding the conditions for trades between jurisdictions. As the number of participating programs increases to more than two jurisdictions, then this type of agreement becomes **multilateral**. Based on lessons learned from existing efforts to link greenhouse gas programs, Haites (2014) describes four essential aspects of a bilateral or multilateral approach:

1. A decision by each jurisdiction that linkage is in its overall best interest
2. Design features adapted as necessary to make them compatible and consistent so as to protect the environmental integrity of the linked system
3. Arrangements to maintain the compatibility and consistency of design features over time
4. A legal agreement to formalize the link and arrangements

IMPLICATIONS FOR INTERSTATE OFFSET AND TRADING PROLICIES

Once a decision has been made to engage in interstate trading, the next decision is which policies or approaches are used to allow credits generated in one state to be sold in another. For discussion purposes let us refer to the Buyer's State and the Seller's State. Let us also assume that trades are one-way (unilateral) trades into the Buyer's State.

Home Rule Approach

In the home rule approach, credits from the Seller's State must meet all the criteria (certification, etc.) of the Buyer's State.

Some potential advantages of the home rule approach are its equitable treatment of all credits used in the Buyer's State regardless of which state the credits were generated, and the fact it would require little or no changes to the Buyer's State's rules and procedures. Depending on the Seller's State's priorities, the Seller's State may welcome this approach because it would require no additional work on its part and, as sellers make reductions beyond their baselines, those reductions may count towards the Seller's State's TMDL goals. Baseline is a very significant issue and is discussed in the next section.

If, in this example, the Seller's State also wanted to allow out-of-state credits into their state, the two states could strike a bilateral agreement for two-way trading. For example, they could both adopt a home rule approach for credits entering their respective states. In such a situation, credits used by a buyer within either state would always meet that buyer's state's home rule, regardless of where the credits were generated.

External Recognition Approach

A second broad approach for allowing out-of-state credits is an external recognition approach, whereby the Buyer's State allows out-of-state credits using the Seller's State's procedures; this is essentially the opposite policy of the home rule approach.

Adoption of an external recognition approach by the Buyer's State would imply that the Buyer's State perceives the Seller's State's certification process as equal or sufficiently equitable. If it did not, then real or perceived issues of inequity could arise. However, if the need for interstate trading is real and the need is strong, the Buyer's State's willingness to rely on the Seller's State's certification process may well be justified even if some aspect is not perceived to be 100 percent equal or equitable within reason.

Combined Approaches

Combined elements of the home rule and external recognition approaches can be envisioned, along with additional features not inherent to either approach. An example of a combined approach is the market for renewable energy certificates (RECs). Most RECs are created and registered according to

rules established by regional tracking systems; however, each state defines its own rules regarding the types of fuels and technologies that are eligible to be sold as renewable energy in their state programs.

Third Party Approach

Another broad approach would be to rely on a third party organization with its own rules and procedures for certifying credits, regardless of the state in which a credit is generated. Likely, two or more jurisdictions would need to form an entity to play this role. This approach would essentially seek to create a third option that the states agree to in the context of interstate trading.

SATISFYING PERMIT CONDITIONS

In the Chesapeake Bay watershed, TMDL allocations were informed by each jurisdictions' watershed implementation plans. As further background, federal regulations require that NPDES permits must be consistent with the assumptions and requirements of any applicable TMDL wasteload allocation (WLA), 40 C.F.R. § 122.44(d)(1)(vii)(B). By extension, if a permittee is satisfying the water quality compliance obligations of such a permit through the purchase of credits, the credits purchased must also be consistent with the assumptions and requirements of the applicable TMDL WLA. How does this apply if the buyer and seller are in separate jurisdictions under differing TMDL conditions? Additionally, are there any ramifications concerning permit compliance of the buyer as well as state TMDL progress?

Ensuring credits purchased are consistent with the assumptions and requirements of the buyer's permit could be accomplished in a number of ways. Two such scenarios are represented by the first two rows in the table below, in which the credit generator uses the assumptions and requirements underlying the buyer's permit to set the baseline for credit generation. We can think of this as using the buyer's home state rules. For example, if the buyer's home state uses a performance-based model, such as Maryland does, to express the baseline for potential in-state nonpoint sources, and that same exact model and all of its conditions and assumptions are also applied to a potential out of state seller, that would satisfy the buyer's permit. This can equally be true if the buyer's home state uses a practice-based tool/model, such as Virginia does, to express the baseline for potential in-state nonpoint sources, again if also applied to out of state sellers. Whether performance-based or practiced based, Scenarios 1 and 2 satisfy the buyer's permit, denoted by "Yes" in the third column for the first two rows. Note however that this does not assure that the seller's TMDL goals will be satisfied (Scenario 2).

Policy Decision: Credits generated using assumptions and requirements or using seller's baseline?	**Are the assumptions and requirements in the buyer's permit more stringent than the seller's baseline?**	**Will the buyer's permit be satisfied?**	**Will the seller's TMDL goals be satisfied?**
Scenario 1: Use assumptions and requirements of buyer's permit	Yes	Yes	Yes (over satisfied)
Scenario 2: Use assumptions and requirements of buyer's permit	No	Yes	No
Scenario 3: Use seller's baseline	No	Yes (over satisfied)	Yes
Scenario 4: Use seller's baseline	Yes	No	Yes

In Scenario 3 the baseline for selling credits is based on the seller's baseline rules rather than the assumptions and requirements of the buyer's permit. We can think of this as using the seller's home state rules. Since in Scenario 3 the seller's baseline rules are more stringent than the assumption and requirements of the buyer's permit the buyer's permit would indeed be satisfied, strictly speaking over satisfied as long as the buyer's home state uncertainty ratio, as appropriate, was applied to credits generated by the seller.

The assessment of the assumptions and requirements of the buyer's permit involves examining the load allocations (LAs) as well as other WLAs that the buyer's permit assumes will also be met, as used to justify the particular WLA assigned to the buyer's permit. As a practical matter if the LA assumed in the buyer's permit has already been translated into a finite set of BMPs for agricultural fields for example, those BMPs could be compared to the seller's baseline to determine which is more stringent.

Note that all of these scenarios are simplified for discussion purposes given that they do not consider the location of the buyer and seller relative to each other, do not consider local TMDLs or other local water quality constraints, and that assumptions and requirements incorporated into buyers' permits

may vary from permit to permit within the same state. There may also be delivery factors, retirement ratios, or other elements that the states will need to determine how to incorporate.

That said, unlike the first three scenarios Scenario 4 would not satisfy the buyer's permit. In this case the seller's baseline is used to generate credits, but since the assumptions and requirements of the buyer's permit are more stringent the credits would not satisfy the buyer's permit. This could be remedied for example by applying an additional trading ratio or credit multiplier to ensure equivalency of the credits generated and the credits purchased.

The simple takeaway from the table is that when choosing whether to generate credits based on the buyer's permit or based on the seller's baseline rules, if one always chooses whichever basis for credit generation is more stringent, doing so satisfies the assumptions and requirements of the buyer's permit and will fulfill the seller's TMDL goal. The other takeaway is if one always chooses the less stringent basis for generating credits, either the assumptions and requirements of the buyer's permit or the seller's TMDL goals will not be fully satisfied.

These again are not hard and fast outcomes since the examples are somewhat simplified, but do serve as a basis for understanding the basic choices.

APPROACHES FOR HARMONIZING PROGRAMS

Even in the simple case where each state takes its own respective home rule approach some improved harmonization could be valuable to the potential buyers and sellers. Below are a few examples that may benefit from harmonization.

Eligible Practices for Generating Credits. Defining eligible practices for generating credits is generally well harmonized in the Chesapeake Bay watershed because, as a starting point, all states rely on a list of BMPs approved by the Chesapeake Bay Program Partnership. However, some states may discourage or not allow certain BMPs to generate credits such as agricultural land retirement, or may include additional nuances not fully captured by the Partnership's definitions.

Procedural Requirements for Credit Certification, Verification, and Trading. The process of certifying and verifying credits can be costly, not only for the administering agency, but also for the program participants. When procedures are different across programs, the added complexity can increase transaction costs and create significant disincentives for program participants to consider or engage in interstate trading. Even in the case of home rule and external recognition, both described as relative easy to implement, likely some level harmonization procedures may help facilitate cross-border credit trading to maintain integrity and minimize cost.

Trading and Other Ratios. The individual state programs in the Chesapeake Bay watershed require different types and combinations of trading ratios, such as reserve, retirement, and uncertainty ratios, which are primarily used to reduce or mitigate performance risks from credit-generating practices. Differences in these ratio requirements, including the point at which the ratios are applied, can have implications for interstate trading (WRI, undated). If one state requires the ratio to be applied when the

credit is generated (e.g., Pennsylvania) and another state when it is purchased (e.g., Virginia), then the combined effect of these ratios will be very different depending on the direction of interstate trade. Both ratios will need to be applied in a trade from the first to the second state, whereas neither will be required if the trade occurs in the other direction.

Baseline and Credit Calculation. Both of these issues were discussed in previous sections primarily in the context of adopting one jurisdiction's approach and applying to the other's for the purposes of interstate trading. Another option would be to harmonize baseline and credit calculation methodology across two or more jurisdictions for all trading within each state and state to state.

IMPLICATIONS FOR TRADING PROGRAM ADMIINSTRATION

Previous examples made a point that interstate trading might not necessarily require changes in how the states' programs are administered. In cases where such changes may be needed, below are examples of program administration that could be affected.

- Review of credit applications
- Certification and issuance of credits
- Verification and monitoring of credited practices
- Registration of certified credits
- Clearinghouse operation
- Registration of credit purchases

The type and extent of administrative changes that may be required will depend on the linking approaches (as discussed earlier), any associated rule changes that are adopted, and whose perspective is being considered.

More substantial administrative changes may be involved if a bilateral or multilateral approach is used to link programs for interstate trading. Bilateral or multilateral agreements also may benefit more from defined agreements up front of any administrative procedures that ensure communication between programs to prevent and resolve disputes that may occur.

PROVIDING TRANSPARENCY: CHESAPEAKE BAY WATERSHED MULTI-JURIDICTION

This section describes an existing resource within the Chesapeake Bay watershed that could, if desired, help facilitate interstate trading with public transparency. The tool has five components known collectively as the Chesapeake Bay Nutrient Trading/Tracking Tool (CBNTT). The CBNTT was built on the World Resources Institute's NutrientNet suite of tools and is comprised of an agricultural assessment tool, a registry, a marketplace, an administrative module, and an interactive mapping feature. Maryland Department of Agriculture and Maryland Department of Environment collaborated with the states of Pennsylvania and Virginia to develop this web-based trading platform.

All components of the CBNTT can be accessed through the trading website, www.mdnutrienttrading.com or directly at www.cbntt.org. Currently this tool is only being used in Maryland. Virginia participated in the early reviews and feedback of the registry development, but is not committed to any one tool or approach at this time. Delaware and Pennsylvania are considering its use but have made no commitment.

The Maryland Nutrient Trading/Tracking Tool (MNTT) is a state-specific version of the online calculation tool that incorporates both Chesapeake Bay Watershed Model input and county-specific agronomic data from the national NTT developed by USDA/NRCS. The use of the MNTT is mandatory in Maryland for determining agricultural baseline eligibility and credit generation capacity.

The central online registry is a database system employed to document, catalogue, and track term and permanent credits and completed trades for all sectors. The registry has been designed to track and display credit-generating projects, verification activities, credits, trades, and credit usage records. Each credit entered in the registry has a unique serial number that remains associated with the credit throughout its lifespan as it is issued, traded, and applied. The registry can accommodate both edge of stream (EOS) and delivered credits and apply customized trading ratios as necessary.

The registry also serves as a transparent, easily accessible medium for conveying relevant information about credits and trades to all interested parties and the public at large. Besides displaying the information noted above, search functionality provides the capability to summarize data by various parameters, including credit term, pollutant type, trading basin, year, and permit type or number. Public users do not need to open an account to access the registry, but individuals and entities involved in trading, such as aggregators, brokers, verifiers, or jurisdictions, can establish accounts to manage the entire process, from the submission of a proposed project for administrative or technical review to the notification of credit use by the buyer.

The marketplace serves as central location, accessible either directly on the trading website or through the registry, to assess trading activity, post available credits or credit needs, and exchange information between potential trading partners. Credit sellers may create listings linked to their accounts to display offers while buyers may solicit credits and advertise bids. The marketplace affords a convenient setting for both parties to negotiate prices and trading terms, but its use is not required. Whether the online marketplace plays a role or not, the actual transaction, as noted above, takes place off line between the seller and the buyer.

ABBREVIATIONS, ACRONYMNS, DEFINITIONS

BMP ..... Best Management Practice
EPA ..... United States Environmental Protection Agency
LA ..... Load Allocation
TMDL ..... Total Maximum Daily Load
WLA ..... Wasteload Allocation

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