SWEMA White Paper

Water Quality Trading: Refining a Compliance Tool for Greater Cost-Effectiveness and Improved Watershed Protection

The Stormwater Equipment Manufacturers Association (SWEMA) is supportive of stormwater management strategies and regulations that incorporate advances in stormwater science, encourage innovation, and successfully protect and restore receiving waters. One such advancement in recent years is the use of water quality trading (WQT) to meet onsite stormwater compliance requirements. This paper represents SWEMA's position on the subject of WQT and includes recommendations for policymakers to utilize when considering how to incorporate credit trading into their state or local best management practices (BMP) toolbox.

Introduction

Clean, healthy waterways benefit everyone. As compliance with post-construction stormwater management regulations becomes more challenging and costly for municipalities and the development community alike, alternate solutions that strike a balance between being cost-effective and still protective of water quality are being sought. WQT, which is trading that allows one source to meet regulatory requirements by purchasing credit for pollutant reductions from another source with lower pollution control costs, aims to meet that need without sacrificing overall environmental benefits (EPA, 2003).

Since the amendments to the Clean Water Act (CWA) in 1987 extended coverage to nonpoint pollution under National Pollutant Discharge Elimination System (NPDES) permits, municipal stormwater programs have been incrementally strengthened each new permit term following an iterative process in an effort

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Federal Water Pollution Control Act, 33 U.S.C. § 1251, et. seq. (commonly referred to as "Clean Water Act").

to meet applicable water quality standards (Allen, Berg, & Dorman, 2018). Impaired waterways can be difficult to restore and are frequently impacted by stormwater runoff from both new and existing development. New development is generally governed by NPDES permit coverage, which establishes minimum water quantity and water quality requirements that must be met. Existing development is land that has been previously built upon, often when stormwater regulations were less effective or not required. When these properties are redeveloped, the aging on-site or non-existent infrastructure, which has potentially contributed significant amounts of untreated stormwater runoff to our local waterways, can be replaced or constructed with modern stormwater best management practices (BMPs), such as green infrastructure (GI) or manufactured treatment devices (MTDs), that address water quantity and water quality.

To meet the CWA's goal of fishable and swimmable waters, a variety of compliance tools are needed to fix all impaired waterways. WQT is one additional tool for the toolbox. WQT is based upon the premise that the cost to reduce pollutant load in a specific watershed can vary widely. Within the trading framework, a permittee facing higher pollution control costs may be able to meet regulatory obligations by purchasing environmentally equivalent pollution reductions from another source at lower cost. Most frequently, WQT is discussed as a tool for a source to meet its CWA regulatory obligations by purchasing water quality improvements (such as nutrient reductions) from another entity instead of, or in addition to, installing BMPs at its own facility (Partnership, Institute, & Trading, 2015). From a development perspective, there is practicality in the concept of generating credits where the cost of compliance is low and then selling those credits, where the cost of compliance is high, especially in the same watershed. One advantage of WQT programs is that they have the flexibility to take on a variety of challenges to meet permit requirements as well as they can be molded to best meet local community goals.

Another advantage of WQT programs is that they can address impairments from a wide variety of pollutants, including sediment, nutrients, and temperature. States with WQT programs are included in Table 1. State programs vary widely as do the regulatory mechanisms used to implement them. Nutrients, particularly total nitrogen (TN) and total phosphorus (TP), are commonly targeted pollutants of concern. Less commonly, stormwater quantity concerns are addressed via a WQT program, such as Washington, D.C's Stormwater Retention Credit program. Under that construct, a project generates retention credits by installing BMPs capable of retaining runoff onsite or removing existing impervious surfaces.

However, WQT is not a one-size-fits-all solution for addressing pollution reduction requirements. A trading program should not replace onsite treatment entirely. Treating stormwater runoff is most effective when able to design and construct stormwater quantity and quality post-construction BMPs close to the pollutant source. Otherwise, untreated stormwater will carry pollutants to local rivers and streams leading to further degradation. Not requiring a baseline level of treatment onsite will create hotspots. The cumulative effect of those throughout a watershed may offset any improvements seen through trading. Enhanced utilization of this compliance tool can lead to healthier waterways, but is best used as a supplement to, rather than a replacement for, baseline treatment.

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- History of Federal Water Quality Credit Trading Guidance

In January 2003, the Environmental Protection Agency (EPA) announced a WQT policy intended to serve as an innovative approach to assist industry and municipalities in meeting CWA obligations. This work had begun years before, in 1996, as a draft framework released during the Clinton administration. The new policy identified a number of objectives, such as: establishing economic incentives for voluntary pollutant reductions from point and nonpoint sources within a watershed or reducing the overall cost of compliance with water quality-based requirements. The policy endorsed trading of credits for nutrients and sediment loads, but also the trading of other pollutants that pose an environmental risk on a case-by-case basis (EPA 2003 Policy).

In 2007, the Water Quality Trading Toolkit for Permit Writers was EPA's next step in support of WQT. The Toolkit provided NPDES permit writers with guidance on incorporating trading provisions into permits to ensure compliance with CWA requirements. By providing guidance on design and implementation, EPA hoped the toolkit would jump-start the development of successful water quality trading programs. In a 2017 report prepared by the Government Accounting Office (GAO), 19 WQT programs were found to be operating as of 2014 across much of the country, from California to Florida. However, the volume of trading remained low, despite the presence of these programs and existing guidance. The report stated, "According to stakeholders, two key factors have affected participation in nutrient credit trading — the presence of discharge limits for nutrients and the challenges of measuring the results of nonpoint sources' nutrient reduction activities (GAO Report, 2017)." Additional WQT programs have come online since the GAO report was published; however, demand for credits remains lower than originally expected.

In February 2019, EPA released updated guidance on WQT to reiterate the Agency's support for such programs and seek to simplify or streamline their use (EPA Memo, 2019). This was done to encourage growth of market-based programs to reduce water pollution at lower overall costs and incentivize further implementation of technologies and land use practices to reduce nonpoint pollution. The 2003 guidance was interpreted rather prescriptively by regulators and EPA sought to clarify and modernize the policy. Within the 2019 guidance, the agency identified principles designed to encourage creativity and innovation in the development and implementation of market-based pollution reduction programs.

WQT is not appropriate everywhere. Even with existing guidance in place, there are advantages and challenges for stakeholders to consider prior to establishing a WQT program. When implemented correctly, WQT programs may deliver reduced project costs while still being protective of the environment. However, if a robust program is not established, local water quality can suffer through development of pollution hotspots.

Table 1. Examples of States with Active Trading Statutes, Rules, Policies, and/or Guidance

IMPREMENTING STATE AGENCY (ACRONYM USED)	FORM OF STATEWIDE TRADING AUTHORITY (INCLUDING CHESAPEAKE, AND MULTIPLE WATERSHED RULES FOR NORTH CAROLINA)				PERMITS ISSUED WITH TRADING
	STATUTE	RULE	POLICY	GUIDANCE	
Arkansas Department of Environmental Quality (ADEQ)	X				
Colorado Department of Public Health and the Environment (CDPHE)			X		X
Florida Department of Environmental Protection (FL DEP)	X	X			X
Idaho Department of Environmental Quality (ID DEQ)		X		X	X
Maryland Department of Agriculture (MDA) and Maryland Department of the Environment (MDE)	X		X	X	
Minnesota Pollution Control Agency (MPCA)	X				X
Montana Department of Environmental Quality (MT DEQ)		X	X		
North Carolina Department of Environment and Natural Resources (NC DENR))		X			
Ohio Environmental Protection Agency (OH EPA)		X			X
Oregon Department of Environmental Quality (OR DEQ)	X			X	X
Pennsylvania Department of Environmental Protection (PA DEP)		X		X	X
Utah Department of Environmental Quality (UT DEQ)		X			
Virginia Department of Environmental Quality (VA DEQ)	X	X		X	X
Washington Department of Ecology (WA DOE)				X	
Wisconsin Department of Natural Resources (WI DNR)	X			X	

Source: Partnership, Institute, & Trading, 2015)

Advantages and Challenges Associated with WQT Programs

Advantages

- Reducing overall costs

Over the lifetime of a BMP, operation and maintenance costs can be a significant expense that should be considered when selecting a treatment method (Weiss, Gulliver, & Erickson, 2005). The costs of constructing stormwater BMPs in densely populated areas or on highly impervious sites can be high. Typically, urban land is expensive, and often these sites have challenges such as limited space, poor or contaminated soils, and utility conflicts that make optimizing building and parking footprints difficult. Many times the only option is to go underground with stormwater management BMPs. Suburban development patterns often result in lower upfront land costs and greater site flexibility which can reduce the overall costs of BMPs.

In Virginia in 2015, research by the University of Virginia and the Virginia Department of Transportation (VDOT) indicated the agency could save an average of 50% on projects when purchasing nutrient credits from credit generating sources in lieu of onsite stormwater treatment (Table 2 below). Savings were attributed to the avoidance of the upfront design and construction costs and additional purchase of right-of-way and through the elimination of annual maintenance costs. The same report also noted that variability in costs, which are dependent on the specifics of any given BMP, make it difficult to generalize savings prior to construction (Nobles, et al, 2014). Utilizing credits allows some or all onsite water quality BMP construction and maintenance to be avoided. When confronted with a choice between expensive onsite options or less expensive offsite options that allow them to forego some or all ongoing maintenance costs, most developers and agencies will naturally choose the least expensive option.

- Compliance flexibility

WQT creates a flexible framework through which pollutant reductions may be achieved over the broader watershed versus a single development site at a fraction of the overall cost on a per pound removal basis. The watershed scale helps to create opportunities for reductions in areas and across sectors that may not otherwise see stormwater management improvements. Temporary or permanent reductions generated from water quality BMPs installed on less intense land uses are expected to offset the effects of not installing water quality BMPs on more intensely developed land.

- Creates space for other uses

Land is critical to development projects. On urban development projects and other highly impervious sites, useable land may be at a premium. By not having to install a large single BMP or multiple smaller BMPs across a site, an owner creates space to increase building size or provide additional parking and/or other site amenities important to them.

Challenges

- *Establishing a currency*

Determining a common unit to exchange, or currency, is paramount to a successful trading program. It should be simple to measure and proven to improve water quality, such as a specific volume of runoff or mass of nutrient. Therefore, determining what is ultimately allowed to be traded can be difficult. If the currency selected is not a significant contributor to water quality impairments, trading may not be viable in the first place. EPA supports trading that involves nutrients or sediment loads and recognizes that other parameters have the potential to improve water quality.

Table 2. VDOT Cost Savings by Participating in WQT versus On-site BMPs_2015

BMP ID	BMP Cost per Pound of Annual Phosphorus Removal			Cost Savings	
	Excluding ROW	Including ROW	Credit Cost	Excluding ROW	Including ROW
1	$18,545.89	$31,540.61	$20,000	-7.84%	36.59%
2	$35,527.32	$53,884.30	$20,000	43.71%	62.88%
3	$15,152.52	$20,096.50	$19,000	-25.39%	5.46%
4	$21,604.80	$32,497.93	$18,700	13.45%	42.46%
5	$40,052.86	$50,469.73	$18,700	53.31%	62.95%
6	$37,535.42	$48,552.88	$18,700	50.18%	61.49%
7	$31,522.45	$36,199.35	$18,700	40.68%	48.34%
8	$46,735.48	$54,759.91	$18,700	59.99%	65.85%
9	$54,852.59	$74,943.71	$18,700	65.91%	75.05%
Median				43.71%	61.49%
Average	$33,500	$44,770		32.66%	51.23%
BMP= best management practice; ROW = right of way					
Source: Nobles, et.al. (2014)					

- *Effect of other pollutants on water quality*

Regardless of the currency selected for the trading program, consideration needs to be given to other constituents not chosen and their effect on the post-construction environment. Urban stormwater runoff contains a wide range of pollutants, from nutrients and heavy metals to trash, bacteria, oil, and other toxic hydrocarbons. The cumulative increases of other constituents while reducing the primary one may result in a net decrease in water quality. This can be mitigated by requiring a base level of treatment on all sites.

- *Determining trading boundaries*

Managing stormwater runoff is most appropriately done as close to the source of impacts as possible. A wider geography may have a negative effect on local water quality while a narrow one may inhibit the growth of a program by unnecessarily restricting credit generators and purchasers alike. Striking a balance can be difficult. EPA guidance suggests that a defined trading area that aligns with watershed boundaries or Total Maximum Daily Load (TMDL) boundary should result in trades that affect the same body of water or stream.

- *Adequately protecting local water quality*

EPA guidance supports WQT in unimpaired waters and impaired waters to maintain water quality standards. The agency does not support trades that result in an impairment to an existing or designated use, adversely affects drinking water, or exceeds a cap established by a TMDL. According to the National Water Quality Inventory, 70 percent of lakes, reservoirs, and ponds; 78 percent of bays and estuaries; and 55 percent of rivers and streams assessed in the United States are impaired by pollution and do not meet minimum water quality standards (National Association of Conservation Districts, 2020). Building a program that can achieve water quality goals is challenging with so many impaired waterways in this country.

- *Determining acceptable credit generating practices*

The types of BMPs eligible to generate credits and the length of the credits lifespan are critical to implementing an effective program. Term credits are generated from BMPs that have a specified lifetime or maintenance cycle, i.e. annual, three- year, and five-year. These are generally associated with traditional BMPs that require routine maintenance to function as designed. Perpetual credits are those generated by practices that result in permanent nutrient reduction. The type of credit and BMP used to generate it will have varying maintenance requirements. The lifespan of the credit and the maintenance requirements associated with it will impact the overall cost of the credit.

- Tracking and verification processes and policies

The timing of credit verification is critical. A credit generating facility should not be allowed to sell credits before the practice is installed. The responsibility to verify BMP installation, operation, and maintenance may fall on different entities. Depending on the type of practice implemented, it may also be necessary to release credits in a staged process versus up front. This would ensure the practice is operating fully and all design criteria are met. To ensure a BMP is installed or managed correctly, a program should require engineering design for structural BMPs, proper inspection by local program staff or third-party inspectors, and as-built drawings upon completion.

A successful program should also have a system to track credit generation and use. An interactive geographical information system (GIS) is ideal. To be most impactful, a management system should track the name of the credit generating facility, the type of BMP installed, the number of credits generated, the number of credits used, and develop a mechanism to alert potential users when credits run low.

- Managing public risk, outreach, and transparency

Uncertainty exists in trying to properly quantify pollutant reductions in WQT programs. In spite of the risk associated with varying BMP performance, changing weather, long-term market and program interest, and future land transfers and ownership, the general public must be assured that actual environmental benefits will be achieved when credit trading programs are used.

Mechanisms do exist to address these concerns.

- Innovation can help address BMP performance.
- Modeling and estimation tools can be developed to address future weather conditions, credit availability, and BMP performance.
- Conservative trading ratios can be deployed to address variability of BMPs and trading geographies.
- Pools of credits can be set aside to be utilized in the event of a catastrophic weather event.
- Cost structures, like price lock programs, can be developed to address future price uncertainty.
- Maintenance bonds or BMP insurance can be required to ensure money exists to maintain credit generating practices.

The benefits and drawbacks of each risk mitigation option should be carefully considered along with region-specific factors (Walker & Selman, 2014).

Program transparency is needed to ensure actual pollutant reductions are achieved through credited practices. Inclusive programs that provide sufficient accountability, transparency, accessibility, and public participation go a long way to ensuring improved water quality is delivered. Accountability in trading is improved when the public is engaged and participating from the earliest stages through the development of programs (Partnership, Institute, & Trading, 2015). EPA expects a credible program to provide adequate public notice that a trading program exists or is in development.

Essential Program Element Recommendations

1) *Simply Defined Credit Currency*

The majority of credit programs use a currency of pollutant load or runoff volume. It is important to keep your chosen currency simple. Runoff volume and pollutant load reductions are direct measures of the resulting impact of BMPs. Utilizing pollutant load enables calculations that can compensate for different runoff sources with different concentrations, resulting in more credits. For example, treating the same amount of runoff from a typical commercial area with a high imperviousness would reduce pollutant loads to a greater extent than treating runoff from a typical low density residential area. Trades between disparate sources is also a fairly simple way of trading based upon pollutant loads, such as a nutrient-intense agricultural source trading with an urban stormwater source.

Trading site runoff volume is also a very simplified approach to credit trading. This assumes that, regardless of the source of runoff, the same amount of volume will be retained. Washington, D.C's SRC program is designed this way. For every gallon of runoff retained, a gallon credit can be sold. From the time period between April 2019 and April 2020, the SRC program experienced 37 credit sales totaling approximately $825,000 and 477,218 gallons retained. The SRC program is set up to prioritize improvements within the municipal separate storm sewer system (MS4) area, this means the gallons retained are in high-priority areas and produce the greatest return on investment. Runoff retention is also an effective means of retaining conventional pollutants like total suspended solids (TSS) and nutrients such as TN and TP. Therefore, trading using runoff volume will also allow the management of a wider range of pollutants. Because peak flow reductions are valued in older cities, where combined sewer systems are present, trading based upon volume retention is likely to result in water quality improvements in areas prone to overflow events or where downstream flooding is a concern.

A similar program, albeit on a smaller scale, has taken root in Chattanooga, TN. That program is driven by a retention requirement associated with an MS4 permit. In Chattanooga's program, there is a performance standard to capture between 1 and 1.6 inches on a given site (referred to as "stay-on volume" or "SOV"), depending upon location in the city.

2) *Protecting Local Receiving Waters*

WQT programs are inherently about providing treatment in one location in lieu of another. In many cases, this shifts water quality protection from more densely populated areas where land and BMPs are expensive to less dense areas where land values are less expensive and BMPs cheaper to build and/or install. In doing so, portions of watershed can be left unprotected from the negative effects of stormwater runoff. Since WQT programs are often developed in response to specific water quality impairments identified on the EPA's 303d list of impaired waters or TMDLs, it is critical that local water quality be adequately protected against the creation of hotspots or further degrade an already impaired waterway. Watersheds subject to TMDLs can range from a few acres feeding a small section of stream to areas as large as the Chesapeake Bay watershed. Protecting local waters can be accomplished through reference to specific hydrologic unit codes (HUC) or watershed of the impaired waterway. Limiting trading to the HUC-12, the subwatershed level, takes advantage of a smaller watershed (roughly 40 square miles) resulting in the greatest environmental impact for the dollars spent.

An alternative approach to ensuring local water quality protection is requiring a base level of onsite stormwater management prior to the utilization of offsite credits. This can be done prescriptively by codifying language that stipulates a specific percentage of pollutant load or volume must be accounted for onsite, e.g. 75% of the pollutant load or 50% of the required treatment volume, prior to the use of WQT. For example, in Grand Rapids, Michigan, developers facing infeasibility constraints must try to retain the increase in stormwater runoff volume associated with a 0.4-inch rain event. If this can be done onsite, then the developer can purchase additional retention capacity, either by paying the in lieu fee or by purchasing stormwater volume credits (SVCs), to meet their remaining compliance obligations (Odefay, et al, 2019).

3) *Mitigating Hydromodification*

Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses (Stein, et al., 2012). Mitigating the effects of hydromodification is a keystone benefit of implementing onsite practices and is supported by EPA guidance. Allowing WQT as an alternative to onsite stormwater management should only be allowed when the implementation of onsite BMPs is infeasible. For example, the Phase I NPDES permit for

Ventura County, CA, requires that LID strategies for managing the water quality design storm be exhausted prior to considering offsite compliance (Los Angeles Regional Water Quality Control Board 2010). Developing infeasibility criteria to be met prior to utilizing credit purchases will help. In the event trading is allowed without determining the feasibility of onsite stormwater management, sites should be limited to 1 acre or less or to those without significant hydromodification impacts.

Trades involving runoff volume are not immune from hydromodification. Flow control protection should be required onsite to prevent negative downstream impacts. Trades should be limited to upstream of the proposed development activity.

4) *Design and Construction Verification Processes*

Regardless of the currency, the amount of available credit generated is dependent on the original assumptions regarding the size and effectiveness of the installed practice. These assumptions will likely be rooted in sound engineering principles and follow state or local BMP design guidance; however, it is common that as-built details vary from the original design details. These differences can be major or minor, but in construction, onsite constructability issues are often discovered and affect final design.

A solution to address these concerns is to require final as-built drawings that must match design plans and adjust the amount of credit given to any one BMP in order to rectify any discrepancies. Codifying who is responsible for final verification is important. In some programs, the contractor can stipulate that plans have been followed. In others, it must be the engineer of record. Ideally, the local program authority or a designee of the program authority will audit the final design to verify the installed conditions match what was designed.

5) *Operation and Maintenance Verification Processes*

Care should be taken to ensure a WQT program has policies in place to ensure the credit-generating facility is maintained in good operating condition for the life of the credit. There are several ways to account for the cost of operation and maintenance of a credit-generating practice. One option is to include the anticipated operation and maintenance cost into the price of a one-time credit purchase. Applying this approach requires the credit-generating facility owner to perform their due diligence as they will be responsible for all operational risk. The facility owner must make assumptions concerning maintenance frequency (both routine and any corrective maintenance) as well as costs over time, such as inflation, and factor those into the front-end cost of the credit. The more maintenance needed over time will increase the cost of the credit. Failure to account for long-term maintenance will result in greater uncertainty respective to how the practice will function. A credit only achieves the expected reductions if the practice is maintained in good-working order.

A better option is to require proof of maintenance and inspection in order for the credit to be renewed. If adequate maintenance cannot be proven, the credit and/or price could be adjusted to reflect the new condition and market costs. The credit can also be expunged and additional BMPs required onsite or at the purchaser's site. A pitfall in an otherwise successful WQT program in Virginia is that all credit purchases are a one-time event, absolving the purchaser of any long-term maintenance obligations and limiting the ability of the local program authority to require any additional onsite measures if the credit-generating facility is not kept in good operating condition.

Allowing the price of credits to change would introduce some uncertainty into the WQT program. This could have a likely effect of limiting participation. However, allowing the price of the credits to be changed at the time of renewal allows the owner to make market adjustments based upon known operation and maintenance frequencies, which helps drive compliance and could lower overall costs. If price is allowed to change over time, credit prices are likely to rise assuming the cheapest credits are purchased first. This fact has made investing in stormwater credits enticing. For example, Prudential invested $1.7 million in the Washington, D.C. SRC program in 2016 to install GI practices that generate credits to be traded for a profit (Spector 2016).

Creating the opportunity to balance current market demands with pricing changes is wise, but should not be done frequently so as to preserve market certainty. Establishing a five-year year window that aligns with credit renewal strikes a balance between flexibility and certainty. This time period is ideal because it would be consistent with NPDES stormwater permit renewal schedules. Any modifications to credit trading contracts should be minimal and limited outside the point of renewal.

6) *Application of Safety Factor*

A way to mitigate concerns associated with unknown future conditions is to account for the difference through the application of a safety factor or trading ratio. The pollutant load or runoff volume of the credit-receiving facility can be required to be offset by a ratio of at least 1.5:1, or a discount in trading value of at least 10% could be applied to the calculated credit value. Retiring credits is another way to build safety program wide. For example, 5% of available credits could be retired every year by the program authority. This helps buttress the credit generation market and improves watershed health without significantly altering the marketplace.

An example of these principles can be found in the State of Maryland's WQT program. In Maryland, an Edge of Tide (EoT) ratio is applied to normalize loads based on delivery to the main stem of the Chesapeake Bay; a reserve ratio of 5% is applied to each credit generated for use by the Maryland Department of the Environment (MDE) to create a reserve pool that can be used to buffer credit losses elsewhere, or be retired as water quality improvement; and an uncertainty ratio of 2:1 is applied to trades involving credits generated by nonpoint sources and acquired by wastewater point sources.

Conclusion

Water quality trading programs are supported by EPA at the Federal level. However, that support does not make credit trading the primary compliance solution for every project. Instead, water quality trading needs to be viewed as an additional tool within the much broader BMP toolbox, akin to how other stormwater infrastructure has been viewed for decades. Water quality will continue to suffer if development is not required to meet a baseline pollutant removal obligation onsite. Striking a balance regarding acceptable use of a WQT program may not be easy, but is necessary. WQT is best used to supplement, rather than replace, baseline treatment near the pollutant source.

Successful trading programs can improve water quality by incorporating strong policies and protocols to ensure actual pollutant reductions are achieved. The traded currency should be volume or pollutant load reduction. Smaller trading geographies should be established to ensure local streams are not sacrificed in lieu of restoring larger receiving waters. Robust verification processes should be enacted to ensure a credit generating facility is constructed correctly initially and remains in good working order throughout the credit's lifespan. Application of a safety factor should account for future market volatility.

The Stormwater Equipment Manufacturers Association supports the development of water quality trading programs across the country that follow these recommendations. Applying these critical program elements will not negatively affect WQT programs, but rather will help to ensure opportunities for broader implementation. Water quality is improved by targeting the most critical watershed threats and allocating resources to achieve the most cost-effective pollutant reductions. Pollution reduction is a mission for all member companies and we applaud efforts to improve water quality through policy and technological innovation.

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Stormwater Equipment Manufacturers Association is comprised of dedicated industry professionals who have come together for the purpose of advocating sustainable and effective solutions for stormwater quality through educational outreach to regulators, design professionals, developers and other stakeholders in clean water initiatives. For more information about SWEMA, visit www.stormwaterassociation.com.

Stormwater Equipment Manufacturers Association
Telephone: +1 (720) 353-4977

www.stormwaterassociation.com