UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office of Water
Water Quality Trading Policy
January 13, 2003

I. Background and Purpose of the Policy

The Clean Water Act (CWA)[1] was enacted in 1972 to restore and maintain the chemical, physical, and biological integrity of the nation's waters. It established a national policy that called for the discharge of pollutants to be eliminated and established interim goals for protecting fish, wildlife and recreational uses. The CWA also established a national policy for development and implementation of programs so the goals of the Act could be met through controls of point and nonpoint sources of pollution. Congress recognized and preserved the primary responsibilities and rights of the States to prevent, reduce and eliminate pollution.

The application of technology and water quality based requirements through the National Pollutant Discharge Elimination System (NPDES) permit program has achieved and remains critical to success in controlling point source pollution and restoring the nation's waters. Despite these accomplishments approximately 40% of the rivers, 45% of the streams and 50% of the lakes that have been assessed still do not support their designated uses[2]. Sources of pollution such as urban storm water, agricultural runoff and atmospheric deposition continue to threaten our nation's waters. Nutrient and sediment loading from agriculture and storm water are significant contributors to water quality problems such as hypoxia in the Gulf of Mexico and decreased fish populations in Chesapeake Bay. Population growth and development place increasing demands on the environment making it more difficult to achieve and maintain water quality standards.

Finding solutions to these complex water quality problems requires innovative approaches that are aligned with core water programs. Water quality trading is an approach that offers greater efficiency in achieving water quality goals on a watershed basis. It allows one source to meet its regulatory obligations by using pollutant reductions created by another source that has lower pollution control costs. Trading capitalizes on economies of scale and the control cost differentials among and between sources.

The United States Environmental Protection Agency (EPA) believes that market-based approaches such as water quality trading provide greater flexibility and have potential to achieve water quality and environmental benefits greater than would otherwise be achieved under more traditional regulatory approaches. Market-based programs can

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1 Federal Water Pollution Control Act (Public Law 92-500, as amended), 33 U.S.C. Sec. 1251, et. seq.
2 About 33 percent of the nation's waters have been assessed by States and tribes pursuant to Section 305(b) of the Clean Water Act (National Water Quality Inventory: 2000 Report, EPA). The proportion of non-assessed water that do not meet designated uses is likely lower since assessments tend to be focused in known problem areas.

achieve water quality goals at a substantial economic savings. EPA estimates that in 1997 annual private point source control costs were about $14 billion and public point source costs were about $34 billion[3]. The National Cost to Implement Total Maximum Daily Loads (TMDLs) Draft Report estimates that flexible approaches to improving water quality could save $900 million dollars annually compared to the least flexible approach (EPA, August 2001). Nitrogen trading among publicly owned treatment works in Connecticut that discharge into Long Island Sound is expected to achieve the required reductions under a TMDL while saving over $200 million dollars in control costs. Market-based approaches can also create economic incentives for innovation, emerging technology, voluntary pollution reductions and greater efficiency in improving the quality of the nation's waters.

The purpose of this policy is to encourage states, interstate agencies and tribes to develop and implement water quality trading programs for nutrients, sediments and other pollutants where opportunities exist to achieve water quality improvements at reduced costs. More specifically, the policy is intended to encourage voluntary trading programs that facilitate implementation of TMDLs, reduce the costs of compliance with CWA regulations, establish incentives for voluntary reductions and promote watershed-based initiatives. A number of states are in various stages of developing trading programs. This policy provides guidance for states, interstate agencies and tribes to assist them in developing and implementing such programs.

This policy addresses issues left open by and limitations encountered implementing projects and programs under EPA's January 1996 Effluent Trading In Watersheds Policy and May 1996 Draft Framework for Watershed-Based Trading ("Draft Framework"). This policy should be given precedence over any inconsistencies with the Draft Framework.

This policy draws upon lessons from a number of recent pilot trading projects and state experiences in developing water quality trading programs. These initiatives demonstrate how trading can occur under the CWA and existing federal regulations. They illustrate the importance of voluntary watershed-based partnerships, inter-agency cooperation and public participation in implementation of trading programs. They show that flexible market-based approaches can facilitate states and tribes finding solutions to complex and diverse water quality and socioeconomic issues. These efforts have also highlighted the importance of keeping transaction and administrative costs manageable while retaining accountability. The lessons learned from these efforts have informed the development of this policy.

This policy describes various requirements of the CWA and implementing regulations that are relevant to water quality trading, including: requirements to obtain permits (Sections 402 and 404), antibacksliding provisions (Section 303(d)(4) and Section 402(o)), the development of water quality standards including antidegradation policy (Section 303(c)), federal NPDES permit regulations (40 CFR Parts 122, 123 and 124), TMDLs (Section 303d(1)) and water quality management plans (40 CFR Part 130).

3 A Retrospective Assessment of the Costs of the Clean Water Act: 1972 – 1997 (EPA October, 2000).

These CWA provisions and regulations contain legally binding requirements. This policy does not substitute for those provisions or requirements. In addition, this policy identifies general elements and provisions that EPA believes are important for creating credible water quality trading programs.

When EPA makes a decision with regard to any particular permit, TMDL, water quality standards or water quality management plan that includes provisions for trading to occur, it will make each decision on a case-by-case basis guided by the applicable requirements of the CWA and implementing regulations and the specific facts and circumstances involved.

II. Trading Objectives

EPA supports implementation of water quality trading by states, interstate agencies and tribes where trading:

A. Achieves early reductions and progress towards water quality standards pending development of TMDLs for impaired waters.

B. Reduces the cost of implementing TMDLs through greater efficiency and flexible approaches.

C. Establishes economic incentives for voluntary pollutant reductions from point and nonpoint sources within a watershed.

D. Reduces the cost of compliance with water quality-based requirements.

E. Offsets new or increased discharges resulting from growth in order to maintain levels of water quality that support all designated uses.

F. Achieves greater environmental benefits than those under existing regulatory programs. EPA supports the creation of water quality trading credits in ways that achieve ancillary environmental benefits beyond the required reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and wildlife and/or waterfowl habitat.

G. Secures long-term improvements in water quality through the purchase and retirement of credits by any entity.

H. Combines ecological services to achieve multiple environmental and economic benefits, such as wetland restoration or the implementation of management practices that improve water quality and habitat.

III. Water Quality Trading Policy Statement

A. CWA Requirements. Water quality trading and other market-based programs must be consistent with the CWA.

B. Trading Areas. All water quality trading should occur within a watershed or a defined area for which a TMDL has been approved. 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.

C. Pollutants and Parameters Traded. EPA supports trading that involves nutrients (e.g., total phosphorus and total nitrogen) or sediment loads. In addition, 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. EPA believes that such trades may pose a higher level of risk and should receive a higher level of scrutiny to ensure that they are consistent with water quality standards. EPA may support trades that involve pollutants other than nutrients and sediments on a case-by-case basis where prior approval is provided through an NPDES permit, a TMDL or in the context of a watershed plan or pilot trading project that is supported by a state, tribe or EPA.

EPA also supports cross-pollutant trading for oxygen-related pollutants where adequate information exists to establish and correlate impacts on water quality. Reducing upstream nutrient levels to offset a downstream biochemical oxygen demand or to improve a depressed in-stream dissolved oxygen level are examples of cross-pollutant trading.

EPA does not currently support trading of pollutants considered by EPA to be persistent bioaccumulative toxics (PBTs). EPA would consider a limited number of pilot projects over the next two to three years to obtain more information regarding trading of PBTs. EPA believes pilot projects may be appropriate where the predominant loads do not come from point sources, trading achieves a substantial reduction of the PBT traded and where trading does not cause an exceedance of an aquatic life or human health criterion. Based on the findings of these pilot projects, EPA will consider making revisions to its policy.

Where state or tribal water quality standards allow for 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.

D. Baselines for Water Quality Trading. As explained below, the baselines for generating pollution reduction credits should be derived from and consistent with

water quality standards. The term pollution reduction credits ("credits"), as used in this policy, means pollutant reductions greater than those required by a regulatory requirement or established under a TMDL.

For example, where a TMDL has been approved or established by EPA, the applicable point source waste load allocation or nonpoint source load allocation would establish the baselines for generating credits. For trades that occur where water quality fully supports designated uses, or in impaired waters prior to a TMDL being established, the baseline for point sources should be established by the applicable water quality based effluent limitation, a quantified performance requirement or a management practice derived from water quality standards. In these scenarios the baseline for nonpoint sources should be the level of pollutant load associated with existing land uses and management practices that comply with applicable state, local or tribal regulations.

E. When Trading May Occur.

1. Trading to Maintain Water Quality Standards. Trading may be used to maintain high water quality in waters where water quality standards are attained, such as by compensating for new or increased discharges of pollutants.

2. Pre-TMDL Trading In Impaired Waters. EPA supports pre-TMDL trading in impaired waters to achieve progress towards or the attainment of water quality standards. EPA believes this may be accomplished by individual trades that achieve a net reduction of the pollutant traded or by watershed-scale trading programs that reduce loadings to a specified cap supported by baseline information on pollutant sources and loadings.

EPA also supports pre-TMDL trading that achieves a direct environmental benefit relevant to the conditions or causes of impairment to achieve progress towards restoring designated uses where reducing pollutant loads alone is not sufficient or as cost-effective.

If pre-TMDL trading does not result in the attainment of applicable water quality standards, EPA expects a TMDL to be developed. After a TMDL has been approved or established by EPA, the reductions made to generate credits for pre-TMDL trading may no longer be adequate to generate credits under the TMDL. This will depend on the remaining level of reduction needed to achieve water quality standards and, where applicable, the allocation of point and nonpoint source pollutant loads established by the TMDL.

3. TMDL Trading. Trades and trading programs in impaired waters for which a TMDL has been approved or established by EPA should be consistent with the assumptions and requirements upon which the TMDL is established. EPA encourages the inclusion of specific trading provisions in the TMDL itself, in NPDES permits, in watershed plans and the continuing planning process.

EPA does not support any trading activity that would delay implementation of a TMDL approved or established by EPA or that would cause the combined point source and nonpoint source loadings to exceed the cap established by a TMDL.

4. Technology-Based Trading. EPA does not support trading to comply with existing technology-based effluent limitations except as expressly authorized by federal regulations. Existing technology-based effluent guidelines for the iron and steel industry allow intraplant trading of conventional, nonconventional and toxic pollutants between outfalls under certain circumstances (40 CFR 420.03).

EPA will consider including provisions for trading in the development of new and revised technology-based effluent guidelines and other regulations to achieve technology-based requirements, reduce implementation costs and increase environmental benefits.

5. Pretreatment Trading. EPA supports a municipality or regional sewerage authority developing and implementing trading programs among industrial users that are consistent with the pretreatment regulatory requirements at 40 CFR Part 403 and the municipality's or authority's NPDES permit.

6. Intra-Plant Trading. EPA supports intra-plant trading that involves the generation and use of credits between multiple outfalls that discharge to the same receiving water from a single facility that has been issued an NPDES permit.

F. Alignment With The CWA. Provisions for water quality trading should be aligned with and incorporated into core water quality programs. EPA believes this may be done by including provisions for trading in water quality management plans, the continuing planning process, watershed plans, water quality standards, including antidegradation policy and, by incorporating provisions for trading into TMDLs and NPDES permits.

When developing water quality trades and trading programs, states and tribes should, at a minimum, take into account the following provisions of the CWA and implementing regulations:

1. Requirements to Obtain Permits. Sources and activities that are required to obtain a federal permit pursuant to Sections 402 or 404 of the CWA must do so to participate in a trade or trading program.

2. Incorporating Provisions For Trading Into Permits. In some cases, specific trades may be identified in NPDES permits, including requirements related to the control of nonpoint sources where appropriate. EPA also supports several flexible approaches for incorporating provisions for trading into NPDES permits: i) general conditions in a permit that authorize trading and describe appropriate conditions and restrictions for trading to occur, ii) the use of variable permit limits that may be adjusted up or down based on the quantity of credits generated or

used; and/or, iii) the use of alternate permit limits or conditions that establish restrictions on the amount of a point source's pollution reduction obligation that may be achieved by the use of credits if trading occurs. EPA also encourages the use of watershed general permits, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions or water quality goals through trading. Watershed permits issued to point sources should include facility specific effluent limitations or other conditions that would apply in the event the pollutant cap established by the watershed permit is exceeded.

3. Public Notice, Comment and Opportunity For Hearing. Notice, comment and opportunity for hearing must be provided for all NPDES permits (40 CFR 124). NPDES permits and fact sheets should describe how baselines and conditions or limits for trading have been established and how they are consistent with water quality standards. EPA does not expect that an NPDES permit would need to be modified to incorporate an individual trade if that permit contains authorization and provisions for trading to occur and the public was given notice and an opportunity to comment and/or attend a public hearing at the time the permit was issued.

4. Consistency With Standard Methods. Where methods and procedures (e.g., sampling protocols, monitoring frequencies) are specified by federal regulations or in NPDES permits, they should continue to be used where applicable for measuring compliance for point sources that engage in trading. EPA believes this is necessary to provide clear and consistent standards for measuring compliance and to ensure that appropriate enforcement action can be taken.

5. Protecting Designated Uses. EPA does not support any use of credits or trading activity that would cause an impairment of existing or designated uses, adversely affect water quality at an intake for drinking water supply or that would exceed a cap established under a TMDL.

6. Antibacksliding. EPA believes that the antibacksliding provisions of Section 303(d)(4) of the CWA 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 limitations contained in an NPDES permit, in a manner consistent with provisions for trading under a TMDL, or consistent with the provisions for pre-TMDL trading included in a watershed plan.

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 limitation (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.

7. Antidegradation. 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). EPA recommends that state or tribal antidegradation policies include provisions for trading to occur without requiring antidegradation review for high quality waters. 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 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 designated uses.

G. Common Elements of Credible Trading Programs. EPA believes that, in addition to including provisions to be consistent with the CWA, trading programs should include the following general elements to be credible and successful:

1. Legal Authority and Mechanisms. Clear legal authority and mechanisms are necessary for trading to occur. EPA believes the CWA provides authority for EPA, states and tribes to develop a variety of programs and activities to control pollution, including trading programs. The CWA and federal regulations provide authority to incorporate provisions for trading into NPDES permits issued to point sources and for trading under TMDLs that include provisions for trading to occur.

In addition, states and tribes should use specific legal mechanisms to facilitate trading. Provisions for trading may be established through various mechanisms, including: legislation, rule making, incorporating provisions for trading into NPDES permits and establishing provisions for trading in TMDLs or watershed plans. These provisions may incorporate or be supplemented by private contracts between sources or third-party contracts where the third party provides an indemnification or enforcement function.

2. Units of Trade. Clearly defined units of trade are 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.

3. Creation and Duration of Credits. Credits should be generated before or during the same period they are used to comply with a monthly, seasonal or annual limitation or requirement specified in an NPDES permit. Credits may be generated as long as the pollution controls or management practices are functioning as expected.

4. Quantifying Credits and Addressing Uncertainty. Standardized protocols are necessary to quantify pollutant loads, load reductions, and credits. States and tribes should develop procedures to account for the generation and use of credits in NPDES permits and discharge monitoring reports in order to track the generation and use of credits between sources and assess compliance.

Where trading involves nonpoint sources, states and tribes should adopt methods to account for the greater uncertainty in estimates of nonpoint source loads and reductions. Greater uncertainty in nonpoint source estimates is due to several factors including but not limited to variability in precipitation, variable performance of land management practices, time lag between implementation of some practices and full performance, and the effect of soils, cover and slope on pollutant load delivery to receiving waters.

EPA supports a number of approaches to compensate for nonpoint source uncertainty. These include monitoring to verify load reductions, the use of greater than 1:1 trading ratios between nonpoint and point sources, using demonstrated performance values or conservative assumptions in estimating the effectiveness of nonpoint source management practices, using site- or trade-specific discount factors, and retiring a percentage of nonpoint source reductions for each transaction or a predetermined number of credits. Where 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.

The site-specific procedures and protocols used in water quality trading programs that involve agriculture and forestry operations should be developed by states and tribes in consultation with United States Department of Agriculture (USDA) agencies. Those procedures should estimate nutrient or sediment load delivery to the stream segment, water body or watershed where trading occurs. Numerous methods and procedures to determine nutrient and sediment load reductions associated with conservation practices on agricultural and forest land have been developed or used by the USDA agencies, including the Natural Resources Conservation Service, Forest Service, Agricultural Research Service and the Cooperative State, Research, Education and Extension Service. Some of these methods may be applied to water quality trading.

As an example, the Revised Universal Soil Loss Equation (RUSLE) may be used in some locations to estimate the sediment yield at the end of a slope in agricultural settings. The sediment yield at the end of a slope coupled with an appropriate method to estimate sediment delivery to the receiving waters can provide a reasonable estimate of sediment load and load reductions. Representative soil sampling to determine the phosphorus content of soils can be used with this approach to estimate non-soluble sediment-bound phosphorus loads and load reductions. Different methods are appropriate to estimate soluble phosphorus and nitrogen loads and load reductions.

EPA and the USDA are working with other agencies to evaluate existing methods and to develop improved methods and procedures for estimating loads from agricultural and forestry lands. More precise estimations will be possible as technologies improve and new technologies are developed.

For storm water runoff other than agriculture, EPA recommends monitoring or modeling to estimate pollutant loads and load reductions. EPA believes this may be based on local hydrology and actual data or pollutant loading factors that relate land use patterns, percent imperviousness or percent disturbed land and controls or management practices in a watershed to per acre or per unit pollutant loads, where other methods are not specified in a permit or regulation.

5. Compliance and Enforcement Provisions. Mechanisms for determining and ensuring compliance are essential for all trades and trading programs. These may include a combination of record keeping, monitoring, reporting and inspections. Compliance audits should be conducted frequently enough to ensure that a high level of compliance is maintained across the program. States and tribes should establish clear enforceable mechanisms consistent with NPDES regulations that ensure legal accountability for the generation of credits that are traded. In the event of default by another source generating credits, an NPDES permittee using those credits is responsible for complying with the effluent limitations that would apply if the trade had not occurred. EPA also recommends that states and tribes consider providing periodic accounting and reconciliation periods and establishing appropriate enforcement provisions for failure to generate the quantity of credits that are traded.

EPA recommends that states and tribes consider the role of compliance history in determining source eligibility to participate in trading.

EPA recommends that states and tribes consider including provisions to address situations where nonpoint source controls and management practices that are implemented to generate credits fail due to extreme weather conditions or other circumstances that are beyond the control of the source.

6. Public Participation And Access To Information. EPA supports public participation at the earliest stages and throughout the development of water quality trading programs to strengthen program effectiveness and credibility.

Easy and timely public access to information is necessary for markets to function efficiently and for the public to monitor trading activity. EPA encourages states and tribes to make electronically available to the public information on the sources that trade, the quantity of credits generated and used on a watershed basis, market prices where available, and delineations of watershed and trading boundaries. This information is necessary to identify potential trading

opportunities, allow easy aggregation of credits, reduce transaction costs and establish public credibility.

7. Program Evaluations. Periodic assessments of environmental and economic effectiveness should be conducted and program revisions made as needed. Environmental evaluations should include ambient monitoring to ensure impairments of designated uses (including existing uses) do not occur and to document water quality conditions. Studies should be performed to quantify nonpoint source load reductions, validate nonpoint source pollutant removal efficiencies and determine whether the anticipated water quality objectives have been achieved. Economic evaluations should include the number and type of trades, the price paid for pollutant reduction credits, transaction costs, the costs incurred to administer the program, and where possible any net cost savings resulting from trading.

The results of program evaluations should be made available to the public. An opportunity for comment should also be provided on changes to the program as necessary to ensure that water quality objectives and economic efficiencies are achieved, and that trading does not result in an impairment of designated uses (including existing uses).

H. EPA's Oversight Role. States and tribes are encouraged to consult with EPA throughout development of trading programs to facilitate alignment with the CWA. EPA has various oversight responsibilities under the CWA, including approval or establishment of TMDLs, approval of revisions to state or tribal water quality standards, review of NPDES permits and provisions for reviewing and making recommendations regarding revisions to a state's or tribe's water quality management plans through the continuing planning process. In general, EPA does not believe that the development and implementation by states and tribes of trading programs consistent with the provisions of this policy necessarily warrant a higher level of scrutiny under these oversight authorities than is appropriate for activities not involving trading. However, where questions or concerns arise, EPA will use its oversight authorities to ensure that trades and trading programs are fully consistent with the CWA and its implementing regulations.