



United States
Environmental Protection
Agency

Office of Water
4305

EPA-823-R-02-001
May 2002

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Draft Strategy for Water Quality Standards and Criteria: Strengthening the Foundation of Programs to Protect and Restore the Nation's Waters



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF WATER

MAY 07 2002

Dear Colleague:

I am pleased to transmit for your review our draft *Strategy for Water Quality Standards and Criteria: Strengthening the Foundation of Programs to Protect and Restore the Nation's Waters*.

Water quality standards and criteria are the starting point for a wide range of programs under the Clean Water Act. Therefore, EPA, state and tribal efforts to guide, support, and oversee this national program need to be focused in the right directions. This draft strategy contains strategic actions for the Office of Science and Technology to take in collaboration with other EPA offices and with states and authorized tribes over the next seven years to strengthen and improve the water quality standards and criteria program.

We are already implementing some of the key near-term actions. The strategy is closely linked with the needs of programs that rely on standards and criteria, and with other EPA strategic planning efforts and programs. The strategy derives from a review and analysis over the past year of a wide range of information and recommendations, including an extensive series of meetings with states and other partners, and EPA staff to obtain information, views, and ideas about needs for the water quality standards and criteria program.

We would like your comments and views on this draft strategy. Any comments received by August 16, 2002, will be considered as we finalize the strategy. An electronic copy of this draft strategy is available at www.epa.gov/waterscience/standards. Please direct your comments by letter, e-mail, or fax to:

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Please let me know if you would like to discuss this draft strategy further. We look forward to your comments.

Sincerely,

(signed)

Geoffrey H. Grubbs, Director
Office of Science and Technology

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DISCLAIMER

The discussion in this document entitled "Draft Strategy for Water Quality Standards and Criteria: Strengthening the Foundation of Programs to Protect and Restore the Nation's Waters" is intended solely as a planning document for the Office of Science and Technology within EPA's Office of Water. The statutory provisions and EPA regulations described in this document contain legally binding requirements. This draft strategy is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, states, or the regulated community. This draft strategy does not confer legal rights or impose legal obligations upon any member of the public.

While we have made every effort to ensure the accuracy of the discussion in this draft strategy, the obligations of the regulated community are determined by statutes, regulations, or other legally binding requirements. In the event of a conflict between the discussion in this strategy and any statute or regulation, this document would not be controlling.

This is a living document and may be revised periodically without public notice. We welcome public input on this document at any time. The general description provided here may not apply to a particular situation based upon the circumstances. Interested parties are free to raise questions and objections about the substance of this document and the appropriateness of the application of this document to a particular situation. EPA and other decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from those described in this document where appropriate.

Executive Summary

Water quality standards and criteria are the regulatory and scientific foundation of programs established under the Clean Water Act to protect the Nation's waters. As such, they are among the most critical clean water programs. They need renewed focus and priority-setting, particularly since the nature of water pollution problems and needed solutions have changed dramatically.

This draft strategy is the product of a wide-ranging review of the existing water quality standards and criteria program within the context of all clean water programs. The review covered clean water goals, mandates and authorities; EPA's current strategic goals for clean water and other strategic planning efforts; major needs of the current EPA standards and criteria program and key programs linked to it including total maximum daily loads (TMDLs), National Pollutant Discharge Elimination System (NPDES) permits, and source water protection; and current trends in water quality including emerging environmental problems. The review also considered the results of more than 50 listening sessions conducted for this draft strategy with over 350 people during April-September 2001 and recent recommendations from the National Research Council, the General Accounting Office, EPA's Inspector General, and EPA's National Environmental Justice Advisory Committee.

This draft strategy contains a vision for the future:

All waters of the United States will have water quality standards that include the highest attainable uses, combined with water quality criteria that reflect the current and evolving body of scientific information to protect those uses. Further, standards will have well-defined means for implementation through Clean Water Act programs.

Actions to achieve this vision will need to fill major program gaps, meet important needs of states and authorized tribes, establish key linkages with other programs, address new complexities, make creative use of resources, and most importantly, achieve environmental results. From an analysis of these factors and the listening session results, 28 strategic actions emerged as most important for the program to accomplish over the next seven years. These strategic actions are organized along five directions:

1. **Clarify program requirements** where gaps and lack of clarity have led to uncertainty, inconsistency or inaction. Expanded guidance and targeted oversight will give EPA, states, tribes and stakeholders the same understanding of how to apply the Clean Water Act's requirements for standards.
2. **Enhance implementation guidance and integration** with other programs linked to standards. Focused efforts will strengthen key linkages between standards and other

programs including assessments, TMDLs, permits, drinking water protection, and protection of endangered and threatened species.

3. **Strengthen and maintain the scientific foundation** of water quality programs. These actions focus on developing and enhancing criteria for pollutants which cause the major impairments and threats to the Nation's water quality and continue to lead cutting-edge scientific advances in such areas as nutrient, biological, and waterborne microbial criteria.
4. **Link standards to watershed approaches** at the state and local levels. These actions will support site-specific efforts to help solve water quality problems and will strengthen ways for watershed stakeholders to understand the program, express community preferences for designated uses, and build support for control actions.
5. **Build capacity and share information** among EPA, states and authorized tribes. These efforts will increase interactions at key points (such as triennial reviews), foster more exchanges between standards and criteria professionals and continue to build the capacity of regions, states, tribes and stakeholders to address standards and criteria issues.

The Office of Science and Technology (OST) in EPA's Office of Water will work closely with other EPA programs and with states, authorized tribes, and stakeholders to implement the strategy. OST invites comments on the vision, the strategic actions and the work plan in this draft strategy.

28 Strategic Actions in the Draft Strategy for Water Quality Standards and Criteria

1. CLARIFYING PROGRAM REQUIREMENTS

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| a. Develop clear guidance and provide ongoing support for state and tribal programs to adopt the highest attainable designated uses. |
| b. Develop guidance on the recommended procedures for implementing antidegradation policies. |
| c. Target federal corrective actions to address key environmental problems, and streamline reviews, approvals and disapprovals of submitted standards. |
| d. Review and update the 1994 <i>Water Quality Standards Handbook</i> . |

2. ENHANCING IMPLEMENTATION GUIDANCE AND INTEGRATION

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| a. Develop implementation guidance for new and existing water quality criteria where necessary, including guidance for measuring attainment and applying criteria in TMDLs and permits. |
| b. Develop implementation guidance on specific issues affecting the target levels in TMDLs and water quality-based effluent limits in NPDES permits. |
| c. Complete the national consultation with FWS and NMFS on existing water quality criteria and resolve recurrent issues concerning water quality standards and protection of endangered and threatened species. |
| d. Integrate drinking water, pesticides and other program needs with Clean Water Act needs when developing and revising water quality criteria. |

3. STRENGTHENING AND MAINTAINING THE SCIENTIFIC FOUNDATION

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| a. Provide additional guidance and assistance in implementing criteria for bacteria. |
| b. Provide additional guidance and assistance in implementing criteria for nutrients and continue to publish additional nutrient criteria. |
| c. Coordinate research efforts on waterbody sedimentation and develop a criteria methodology. |
| d. Develop new and revised aquatic life criteria using the 1985 methodology and update important features of that methodology. |
| e. Provide technical guidance for implementing the 2000 methodology for human health criteria and develop new criteria for important pollutants based on that methodology. |
| f. Continue EPA's leadership role in advancing the development and implementation of biological criteria. |
| g. Complete and begin implementing the Strategy for Waterborne Microbial Disease. |
| h. Continually update analytical methods to enable reliable detection of pollutants at levels near the criteria values. |
| i. Encourage applied research that could lead to further guidelines for contaminated sediments and water quality criteria to protect wetlands and wildlife. |

4. LINKING TO WATERSHED APPROACHES

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| a. Coordinate actions on standards and TMDLs and cross-train state, tribal, and EPA staff in the two programs. |
| b. Evaluate whether drinking water uses have been adopted in water quality standards for source waters where needed and take action if gaps are found. |
| c. Provide additional guidance and technical tools for making scientifically-valid site-specific modifications of criteria. |
| d. Address the issue of inter-jurisdictional differences in water quality standards on shared waters. |
| e. Encourage states to use watershed approaches and support early consideration of water quality standards in the watershed planning process. |
| f. Promote increased use of biological criteria and ecological evaluation with other criteria types to address watershed-level protection. |

5. BUILDING CAPACITY AND SHARING INFORMATION

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| a. Obtain early EPA, FWS and NMFS involvement in state and tribal reviews of standards. |
| b. Sponsor meetings, workshops and electronic dialogues with stakeholders to assist in developing and implementing EPA policies and guidance. |
| c. Establish a clearinghouse for states, tribes and EPA to share information on policies, guidance, criteria and implementation approaches. |
| d. Expand Water Quality Standards Academies and other training. |
| e. Maintain and expand on-line services and data bases. |

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DRAFT STRATEGY FOR WATER QUALITY STANDARDS AND CRITERIA: Strengthening the Foundation of Programs to Protect and Restore the Nation's Waters

Background

EPA's water quality standards and criteria program supports and oversees the efforts of states and authorized tribes to set water quality standards for all waters of the United States. Water quality standards – consisting of designated uses for waters, water quality criteria to protect the uses, and antidegradation policies – serve the dual purposes of establishing water quality goals for specific water bodies and providing the regulatory basis for establishing certain treatment controls and strategies. EPA provides policy guidance and the latest scientific information to help states and tribes adopt standards. The Clean Water Act also requires EPA to review and approve or disapprove new and revised standards and to issue replacement federal standards to correct deficiencies where necessary.

In recent years, the Office of Science and Technology (OST) in EPA's Office of Water (OW) has reviewed important elements of the water quality standards and criteria program, including developing a criteria and standards plan in 1998, soliciting public comments on important policy issues through an advance notice of proposed rulemaking in 1998, and conducting an assessment of the standards development and review process in 2000. EPA's Inspector General provided recommendations for process improvements in 2000, and the National Research Council provided scientific recommendations regarding water quality standards and criteria in its 2001 assessment of the total maximum daily load (TMDL) approach.

OST already implemented many of these historical recommendations. Nonetheless, the magnitude of the challenge before EPA, state, and tribal authorities – and the magnitude and importance of many of the remaining issues – can be best answered by an organized, thoughtful and responsive strategy for making sure that appropriate standards are in place as required by the Clean Water Act and implementing regulations. This draft strategy is the product of a wide-ranging review of the standards and criteria program and is intended to set the course for this program for OST and our many partners over the coming years.

The Role of Standards and Criteria in Water Quality Programs

Water quality standards and criteria are the undeniable key to protecting the quality of our Nation's waters. Water quality standards establish the environmental endpoints used to measure success in implementing a variety of Clean Water Act programs. Adequate protection of drinking water supplies, fish and wildlife, and recreational uses in an evolving scientific arena depends on having well-crafted standards and criteria in place for our waters.

Most states developed water quality standards and criteria on a significant scale in the 1970s when the water quality problems being addressed were simpler: for example, assuring adequate dissolved oxygen for fish and shellfish and installing wastewater treatment systems for basic sanitation. These standards and criteria were rarely fine-tuned to address complex issues such as protecting endangered or threatened species, addressing sedimentation and flow, or evaluating ecosystem-wide effects from combinations of pollutants or stressors.

With EPA's assistance, states and authorized tribes have reviewed and updated these standards on an ongoing basis; however, evolving science, dramatically increasing implementation demands, and other circumstances have often significantly outpaced these efforts. For several decades, EPA and states focused more on technology-based controls than on water quality-based programs such as water quality standards. The recent focus on total maximum daily loads (TMDLs), in some cases under challenging deadlines, and on resolving complex National Pollutant Discharge Elimination System (NPDES) permit issues, has heightened the immediate need to strengthen the standards program in many areas. Examples of evolving science include the need to update criteria based on new information, the need to reflect newly-understood local variations in pollutant chemistry and biology, and the desirability of more direct measures of designated use protection through biological criteria.

As the Nation has grown over the past 30 years, so too has the complexity of water quality problems. States, tribes, and EPA need a common understanding of how to implement criteria and standards provisions when monitoring and assessing water quality and developing NPDES permits, TMDLs and nonpoint source controls. For example, states, tribes and EPA should have common approaches for determining which waters are in attainment, setting designated uses, translating narrative criteria into numeric values, establishing mixing zones, dealing with arid areas or wet-weather situations, or allowing variances to standards.

OST developed this draft strategy to identify the key challenges faced by the water quality standards and criteria program and to ensure that the work undertaken by OST and its partners will address the challenges and propel the program into the future. Given the multitude of ways the water quality standards program impacts or guides so many programs under the Clean Water Act, a healthy, responsive water quality standards program is essential to overall success. The strategy gives perspective to meet the daunting and complex workload facing the standards and criteria program and its growing list of short- and long-term needs. The strategy addresses a broad range of policy, scientific, and implementation issues and provides ways to achieve improved linkages with watershed planning and improved information sharing.

Scope of This Strategy

This draft strategy focuses on what OST and other EPA offices need to accomplish to meet program needs of EPA, the states and authorized tribes. In this document, "states" generally means the state, territorial and interstate agencies that have water pollution control responsibilities. "Authorized tribes" means federally-recognized Indian tribes for which EPA has given approval to administer water quality standards programs. For Indian country as a whole, the strategy supplements, but does not replace, the goals and objectives for water quality standards expressed in *Protecting Public Health and Water Resources in Indian Country: A Strategy for EPA/Tribal Partnership*, EPA Office of Water, October 1998.

How This Draft Strategy Was Developed

The draft strategy is the product of a wide-ranging review and analysis of the water quality standards and criteria program within the context of all clean water programs. We considered the following:

- Clean Water Act goals, mandates and authorities that pertain to water quality standards and criteria, including EPA's oversight responsibilities under section 303(c) of the Clean Water Act and EPA's scientific information responsibilities under section 304(a).
- Public comments and statements in public meetings in response to the 1998 Advance Notice of Proposed Rulemaking on the water quality standards regulation.
- Major needs of the standards and criteria program and of programs that link to water quality standards, including water quality monitoring and assessment programs, the TMDL program, the National Pollutant Discharge Elimination System (NPDES) permit program, the wetlands and dredge and fill permit programs, and ocean protection programs under the Clean Water Act, and the source water protection program under the Safe Drinking Water Act.

EPA IS HELPING MORE TRIBES TO RUN WATER QUALITY STANDARDS PROGRAMS

- The Office of Water's Oct. 1998 strategy for Indian country sets a goal that "by 2005, 15% of tribes will have final water quality standards approved by EPA for waters under their jurisdiction." It calls for EPA to provide guidance, technical assistance, training, outreach, and workshops for interested tribes to set up and run standards programs.
- This work has paid off: since 1998 the number of tribes with standards has increased by 50%, from 14 to 21, making it the largest non-grant tribal program in EPA. Nevertheless, it is still only 4% of all tribes. Tribes face many technical and administrative challenges in establishing standards.
- OST and EPA's regional offices is continuing to implement the 1998 strategy to assist tribes, including considering the establishment of federal water quality standards for waters in Indian country that do not have standards.

- Current trends in water quality including emerging environmental problems that may indicate which water quality criteria need to be updated and what types of new criteria are needed.
- Results of more than 50 listening sessions with over 350 people during April-September 2001 and recent recommendations from the National Research Council, the General Accounting Office, EPA's Inspector General, and EPA's National Environmental Justice Advisory Committee. Attachment 1 lists the information sources for this strategy, including the groups who participated. The listening sessions gave participants an opportunity to identify the most important issues regarding water quality standards.
- Strategic goals for clean water as expressed in the annual plan EPA prepares for the federal budgeting process and results of related strategic planning efforts such as draft recommendations from a Program Integration Team of program directors that OW established in 2001.

This review and analysis provided a fresh look at all aspects of the current standards and criteria program. It resulted in important insights, reflected in the pages that follow, concerning the best ways to guide and direct the standards and criteria program into the future. These insights began with this vision for the future for water quality standards and criteria:

VISION

All waters of the United States will have water quality standards that include the highest attainable uses, combined with water quality criteria that reflect the current and evolving body of scientific information to protect those uses. Further, standards will have well-defined means for implementation through Clean Water Act programs.

This vision derives from the provisions of the Clean Water Act and EPA's regulations. It assumes that EPA, states and authorized tribes will use the existing statutory and regulatory framework to adjust designated uses where needed for waters that surpass the quality of the current designated uses and to designate the highest uses attainable for waters where current standards are not attainable. Further, it depends on EPA, states and authorized tribes working together to help standards keep pace with new scientific information and to build capacity for implementing the standards clearly and efficiently.

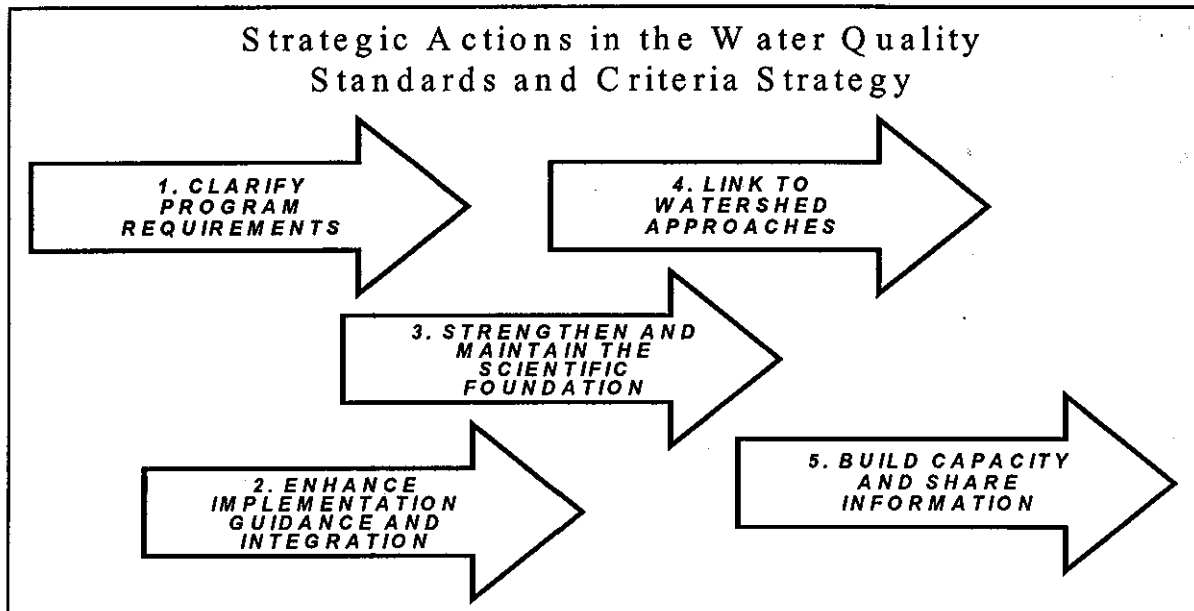
The review and analysis also yielded a very long list of possible ways to strengthen and improve the water quality standards and criteria program. Achieving the vision, however, requires focusing on a limited number of strategic actions that will make the best use of limited

resources and engender the greatest support and collaboration among EPA and its many partners. These factors guided the selection of strategic actions and helped shape their content:

Factors for Selecting and Shaping Strategic Actions

- S Would the action address a **major gap** or lack of clarity in the existing EPA standards and criteria program?
- S Would the action provide an **important link** to restoring and maintaining the Nation's water quality? Would it meet a critical need of a related water quality program such as monitoring, assessment, TMDLs, or permits?
- S Would the action meet a **critical need** identified by states or authorized tribes?
- S Would the action address the increasing scientific and policy **complexities** posed by the accelerating pace of EPA, state, and tribal efforts to restore impaired water quality?
- S Would the action help EPA, states and tribes to **anticipate** and address new environmental problems?
- S Would the action promote **efficient use of resources**? Would it help leverage limited resources?

From an analysis of these factors and all the actions suggested by the review (including the listening sessions), 28 strategic actions emerged as most important to strengthen the water quality standards and criteria program over the next seven years. For example, until recently the lack of quantitative endpoints for excessive nutrients was a major gap in the standards and criteria program. Excessive nutrients account for the fourth-highest number of impaired waters in the United States. Quantitative endpoints are an important link in restoring these lakes and rivers and in maintaining the quality of less-impacted waters. Listening sessions confirmed that this is an important issue for states. Therefore, one of the strategic actions (action 3.b. below) calls for OST to provide additional guidance and assistance in implementing criteria for nutrients and continue to publish additional nutrient criteria documents. As another example, an analysis by OW's Program Integration Team raised the concern that there may be surface waters serving as drinking water sources whose water quality standards do not designate the waters as water supplies. If this is a significant problem across the country, it would represent a critical missing link in public health protection. Therefore, another strategic action (action 4.b. below) calls for the two EPA headquarters offices involved to evaluate the situation and take action if gaps in designated uses are found. Analyses similar to these examples led to each of the other strategic actions.



The 28 strategic actions are organized along five interrelated directions:

(1) **clarifying program requirements** where gaps and lack of clarity have led to uncertainty, inconsistency or inaction;

(2) **enhancing implementation guidance and integration** with other programs linked to standards;

(3) **strengthening and maintaining the scientific foundation** of water quality programs;

(4) **linking standards to watershed approaches** at the state and local levels; and

(5) **building capacity and sharing information** among EPA, states, and authorized tribes.

INTERRELATED STRATEGIES

The strategic actions complement or support the efforts called for in:

- Draft recommendations from the Program Integration Team. EPA Office of Water, 2001.
- Strategy for Waterborne Microbial Disease. EPA Office of Water, August 2001.
- Draft Aquatic Stressors Framework. EPA Office of Research and Development, 2001.
- Strategy for EPA/Tribal Partnership. EPA Office of Water, October 1998.
- Consolidated Assessment and Listing Methodology, Office of Wetlands, Oceans and Watersheds, in development.

The following sections describe each strategic action. A detailed work plan also identifies specific products for each strategic action for the next seven years, their delivery dates, and who in EPA will carry them out (see Attachment 2).

1. CLARIFYING PROGRAM REQUIREMENTS

Assuring that state and tribal water quality standards comply with the requirements of the Clean Water Act and federal regulations is EPA's central role in the water quality standards program. Congress made states and authorized tribes primarily responsible for adopting standards. At the same time, Congress charged EPA with reviewing the adopted standards and replacing any that are not consistent with the federal law.

The listening sessions for this draft strategy yielded an important insight: clear and expanded EPA guidance and targeted oversight will satisfy two sometimes conflicting objectives. It will promote needed national consistency by reducing ambiguity and making it easier for states and tribes to predict which specific standards provisions will be approved by EPA. At the same time, it will assist watershed partnerships to find appropriate solutions to restoring and maintaining water quality at the local level. Participants in the listening sessions provided examples of how ambiguities and gaps in national policy can have serious effects on local progress toward clean water.

The following four strategic actions will clarify program requirements where gaps and lack of clarity have led to uncertainty, inconsistency or inaction. Expanded guidance and targeted oversight will give EPA, states, tribes and stakeholders the same understanding of how to apply the Clean Water Act's requirements for standards.

- a. **Develop clear guidance and provide ongoing support for state and tribal programs to adopt the highest attainable designated uses.** The public relies on EPA, the states and authorized tribes to set designated uses that reflect the goals of the Clean Water Act. Guidance and support will help states and tribes decide where adjustments of uses should be made (such as when higher uses can be attained but are not designated in standards) or when higher uses have been designated that cannot be attained. States and tribes also need guidance for deciding when use adjustments should not be made, such as removing a designated use that is being attained, has been attained since 1975, or can be attained. Having clear national guidance will fill a major program gap and promote more efficient use of standards program resources. States consistently rank this as the single most urgent need from EPA. Some participants believe that lack of clarity from EPA on these issues has prolonged local debates over ultimate goals and has resulted in stalled clean-up progress in the meantime. In the near term, OST will work with other EPA offices, states, authorized tribes, and other partners to issue guidance that clarifies recommended approaches for resolving use-related issues. In the longer term, OST with its partners will provide broader support for efforts to incorporate the highest attainable uses into water quality standards.
- b. **Develop guidance on the recommended procedures for implementing antidegradation policies.** Antidegradation policies are designed to preserve water quality in outstanding water resources, keep clean waters clean where possible, and prevent loss of existing uses through degradation. Implementing such policies can prevent further waters being added to the list of impaired waters needing TMDLs.

Lack of explicit guidance on antidegradation implementation procedures is a major program gap. In the absence of such guidance, each state and tribe must independently develop its own approach with little certainty that EPA will approve it.

c. **Target federal corrective actions to address key environmental problems, and streamline reviews, approvals, and disapprovals of submitted standards.**

Effective EPA oversight is critical to maintaining the integrity of the Nation's water quality standards. OST with assistance of regional and other EPA offices will help resolve known deficiencies in standards, identify states and tribes that have failed to update standards or fill gaps, and promulgate federal replacement standards when deficiencies are not corrected. In concert with EPA's regulation and guidance, these actions will further clarify program requirements. OST and regional offices will also accelerate the approval process for new and revised standards submitted to EPA for review.

FEDERAL STANDARDS ARE IN PLACE TO CORRECT DEFICIENCIES

- Nutrient criteria and fish consumption uses for certain AZ waters.
- Antidegradation provisions for PA.
- Provisions to protect bull trout in ID.
- Full standards for the Colville Confederated Tribes Indian reservation.
- Criteria for selected toxic pollutants in RI, VT, NJ, PR, DC, FL, MI, AR, KS, CA, NV, AK, WA.
- Salinity and fish migration criteria for the San Francisco Bay/Delta.
- Selected provisions to protect the Great Lakes system in IN, IL, MI, OH, NY, WI.

(From 40 CFR 131, subpart D, July 2001.)

- d. In the longer term, **review and update the 1994 *Water Quality Standards Handbook***. This update would incorporate new policies and guidance issued since the *Handbook* was last published in 1994. It could also include a checklist of required standards elements. The *Handbook* could be issued in CD-ROM and/or online versions with hyperlinks to supporting materials.

The Work Plan in Attachment 2 on page 26 shows the detailed steps and products to accomplish these strategic actions.

2. ENHANCING IMPLEMENTATION GUIDANCE AND INTEGRATION

Water quality criteria and standards provide the environmental baselines needed to regulate discharges to water and determine the extent of clean-up actions. New collaboration across programs must occur to solve the Nation's water quality problems. Completing and implementing TMDLs alone requires collaboration among all Clean Water Act programs and among multiple state, tribal, and federal agencies. Preventing contamination of surface water sources of drinking water requires collaboration between Safe Drinking Water Act and Clean Water Act programs.

Opportunities for effective collaboration between the water quality standards program and other water programs are enhanced by implementation guidance for the major technical components of standards so that all parties understand how to implement them. Participants in listening sessions pointed out that older water quality criteria documents, for example, do not recommend how to evaluate attainment of the criteria. Further, they identified key technical issues (such as drinking water protection, stream-flow considerations, mixing zones, endangered species protection, wet-weather effects, and analytical methods) that they believe have been neglected.

The draft strategy does not include a strategic action to revise the national water quality standards regulation to address selected implementation issues. The prevailing view is that a revised regulation would not be the best way to address the issues. Most of the issues raised during listening sessions derive from lack of clarity in policy and guidance for implementing existing requirements, not because of defects in the regulatory requirements themselves. During listening sessions, participants generally suggested how EPA can address important implementation issues with policy and guidance, with virtually no suggestions for a revised regulation. Specific issues may emerge in the future that can best be resolved by establishing new or revised national regulatory requirements, but such steps at this time are not warranted.

The following four strategic actions will enhance implementation guidance and integration with other programs linked to standards. These focused efforts will strengthen key

MANY IMPORTANT WATER ACTIONS ARE LINKED TO STANDARDS

- Assessing which U.S. waters are impaired and not impaired
- Establishing targets and load reductions needed in impaired waters through TMDLs
- Setting limits on pollutants discharged through enforceable NPDES permits
- Issuing permits for dredge or fill activities
- Certifying that other federal licenses or permits comply with standards
- Establishing applicable or relevant and appropriate requirements for on-site responses at Superfund sites

FACILITIES IMPACTED BY STANDARDS ARE INCREASING

- Number of NPDES facilities or sources

1972-1991	100,000
1992-2001	370,000
2002-beyond	400,000-500,000+
- Number of TMDLs

1990s	50-100 per year
2000s	2000-2500 per year

linkages between standards and other programs including assessments, TMDLs, permits, drinking water protection, and protection of endangered and threatened species.

- a. **Develop implementation guidance for new and existing water quality criteria where necessary, including guidance for measuring attainment and applying criteria in TMDLs and permits.** Water quality criteria are a scientific basis for establishing regulatory actions under the Clean Water Act. Applying criteria often involves complex assumptions about pollutant fate and transport, pollutant sources, fluctuations in discharge rates and receiving water flows and chemistry, and biological processes. OST with its partners will either develop new implementation guidance or reference appropriate existing implementation guidance for all new or revised criteria documents. This includes guidance on consistent use of the criteria in monitoring design, attainment decisions, TMDL development, and permit issuance. In the near term, OST with its partners will develop guidance on implementing the duration and frequency components of existing numeric criteria. In the longer term, OST will review criteria to evaluate the need for additional implementation guidance. In specific cases, OST with assistance from partners will develop more comprehensive implementation guidance, such as the implementation guidance discussed below for bacteria and the implementation guidance for mercury now under development.
- b. **Develop implementation guidance on specific issues affecting the target levels in TMDLs and water quality-based effluent limits in NPDES permits.** This will be a continuing effort to address critical issues as they arise in developing TMDLs and permits. The work plan for this strategy shows the priority order to address key issues. For example, in the near term OST will address the technical and policy aspects of flow considerations, mixing zones, and variances. Another issue of importance concerns interpreting and implementing standards in wet weather situations. OST will improve and disseminate modeling tools and analyses to help states, tribes, and EPA regions evaluate wet weather loadings and standards attainment issues. Wet weather situations will also be covered in pollutant-specific guidance, such as the implementation guidance for bacterial criteria. Other issues to be addressed in a priority order include compliance schedules and narrative criteria.
- c. **Complete the national consultation with FWS and NMFS on existing water quality criteria and resolve recurrent issues concerning water quality standards and protection of endangered and threatened species.** The national consultation on 45 aquatic life water quality criteria is a key action established in the 2001 memorandum of agreement between EPA, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service regarding enhanced coordination under the Clean Water Act and Endangered Species Act. The consultation is particularly important because water quality standards containing those criteria are the basis many TMDLs, permits, and other actions. Even with the consultation underway, however, issues continue to arise between the three agencies, including how to avoid multiple consultations on the same waters and same pollutants each time a new TMDL or permit occurs. OST and other EPA offices will use the coordination and elevation

mechanisms established by the memorandum of agreement to address such issues. The agreement specifies other ongoing actions including consulting on new and revised standards and on certain NPDES permits, conducting cross-training between the agencies, organizing early participation of the three agencies in triennial reviews of water quality standards, and elevating unresolved issues to management's attention, are ongoing. In the longer term, OST will continue to sponsor development of technical tools for evaluating how well standards and criteria are protecting endangered and threatened species.

- d. **Integrate drinking water, pesticides, and other program needs with Clean Water Act needs when developing and revising water quality criteria.** OST and other EPA offices have integrated the scientific methodologies for developing drinking water criteria and water quality criteria for human health protection. Under this action, OST with other EPA offices will coordinate the selection of contaminants for criteria development between Safe Drinking Water Act and Clean Water Act programs and will harmonize criteria values as the two programs develop and revise criteria. OST will continue to explore opportunities for similar joint activities with pesticides and other programs.

The Work Plan in Attachment 2 on page 27 shows the detailed steps and products to accomplish these strategic actions.

3. STRENGTHENING AND MAINTAINING THE SCIENTIFIC FOUNDATION

Since the early 1980s, EPA has developed recommended water quality criteria to define water quality conditions and concentrations of specific chemicals in the aquatic environment that will avoid unacceptable adverse biological and human health effects. The first of these criteria were numeric water quality criteria to protect aquatic organisms and human health from chemical and physical stressors. Over the years, EPA has developed other types of criteria such as biological, nutrient, and microbial criteria as important tools for meeting the goals of the Clean Water Act.

Toxic chemicals and other pollutants in the environment may exert effects through a number of exposure routes and receptors. One of EPA's greatest challenges is to continually

EPA HAS ISSUED NATIONAL NUMERIC CRITERIA GUIDANCE FOR 165 POLLUTANTS	
- Synthetic organic chemicals	106
- Pesticides	30
- Metals	17
- Inorganic chemicals	7
- Basic physical/chemical properties	4
- Bacteria	1
Total	165
Of these, 101 are priority toxic pollutants.	

update, refine and improve these different criteria types to reflect both a rapidly evolving scientific understanding of the environment and a growing complexity of environmental issues.

It is important to strengthen and maintain the scientific foundation of water quality programs and to update and refine existing methodologies where the science has evolved. This includes addressing new and complex issues such as chemical mixtures, endocrine disruption and imposex effects, and multiple stressor effects. Meanwhile, it is also important to maintain production of existing criteria types and strengthen the application of these criteria by developing implementation guidance to accompany them where necessary.

The following nine strategic actions will strengthen and maintain the scientific foundation of water quality programs. These actions focus on developing and enhancing criteria for pollutants which cause the major impairments and threats to the Nation's water quality and continuing to lead cutting-edge scientific advances in such areas as nutrient, biological, and waterborne microbial criteria.

HALF OF POLLUTANTS CAUSING WATER QUALITY PROBLEMS CURRENTLY DO NOT HAVE NATIONAL NUMERIC CRITERIA

Selected Causes of Water Quality Impairments, Jan 2002:

Sediment/siltation...14%	Pesticides...4%
Pathogens...13%	Contaminated fish...3%
Metals...11%	Ecol. imbalance...3%
Nutrients..11%	Flow alteration...2%
Low diss. oxygen..10%	Noxious plants...2%
Habitat alterations...5%	Ammonia...2%
Thermal modific'ns..5%	Priority organics...2%
pH imbalances...4%	Unknown...1%

Impairments for which EPA national criteria:

- Have been published 50%
Incl. pathogens, metals, diss. oxygen, pH, fish contaminants, ammonia, priority organics
- Are under development in this strategy 18%
Incl. nutrients, pesticides, biological criteria
- Are in a research phase or not planned 32%
Incl. sediment/siltation, habitat alterations, temperature, flow alteration, noxious plants, unknown

Note: state narrative criteria generally cover all impairment categories.

- a. **Provide additional guidance and assistance in implementing criteria for bacteria.** This is a major and immediate need due to the number of waters with bacteria problems and the significant gaps in policy and technical guidance for implementing the recommended EPA criteria. In the short term, OST will finish guidance proposed in 2001 and include more specific quantitative methods for NPDES permits and TMDLs. In the longer term, OST will continue to help regions, states and tribes implement bacteria criteria.
- b. **Provide additional guidance and assistance in implementing criteria for nutrients and continue to publish additional nutrient criteria.** Nutrient-related issues also rank among the highest needs for the criteria program. In the near term, OST and its partners will develop additional nutrient criteria. EPA is strongly encouraging states and authorized tribes to develop plans describing a strategy, milestones, and schedule for developing and adopting nutrient criteria into their water quality standards. These nutrient criteria plans should be collaborative agreements with EPA that will guide efforts and help jointly evaluate the state's or tribe's progress. In addition, by developing a plan, a state or tribe may the flexibility available in developing nutrient criteria. OST guidance in November 2001 outlined

this flexibility. In the longer term, OST will provide additional guidance on implementation issues regarding monitoring, assessments, permits and TMDLs. OST will continue to work with Regional Technical Assistance Groups on criteria development and implementation.

- c. **Coordinate research efforts on waterbody sedimentation and develop a criteria methodology.** Sedimentation and siltation problems account for more identified water quality impairments of U.S. waters than any other pollutant. OW's Office of Wetlands, Oceans and Watersheds (OWOW) is coordinating the development of guidance for TMDLs involving sediment, including an assessment of the state of knowledge and innovative guidance on assessing watersheds for river stability and sediment supply. Developing water quality criteria for sedimentation will require much research, however. Research is needed to identify sedimentation indicators, analytical methods, dose-response relationships, reference conditions, and waterway classification systems. OST and OWOW are working with the Office of Research and Development (ORD) to guide the short- and long-term research needs for sedimentation as part of the ongoing research described in ORD's draft Aquatic Stressors Research Plans.
- d. **Develop new and revised aquatic life criteria using the 1985 methodology and update important features of that methodology.** In the short term, OST will refine and update criteria for metals and pesticides as needed for critical decisions. In the longer term, OST and ORD recognize that the 1985 guidelines for deriving numeric national water quality criteria to protect aquatic organisms require updates and refinements to reflect advances in scientific understanding and the increased complexity of water quality problems. The methodology could be updated in a priority sequence to address more immediate issues such as additional test species (e.g., mussels, amphibians, darters, plants, and surrogates for endangered and threatened species) and additional endpoints (e.g., hormone disrupting chemicals), followed by more complicated issues such as the regulation of chemical mixtures (e.g., polycyclic aromatic hydrocarbons, or PAHs). Further, new aquatic life criteria will continue to be developed and updated to address emerging chemicals in a priority order, refine existing criteria, and to help protect endangered and threatened species.
- e. **Provide technical guidance for implementing the 2000 methodology for human health criteria and develop new criteria for important pollutants based on that methodology.** In the short term, OST will develop guidance needed to accompany the 2000 human health methodology, particularly for bioaccumulation and exposure assessment. In the longer term, OST and its partners will use the coordinated contaminant selection process identified under strategic action 2.d. to develop new criteria. We will consider emerging pollutant problems, such as endocrine disruptors. OST will work with OW's Office of Ground Water and Drinking Water to harmonize criteria and policy regarding surface water pollutants that are of concern for drinking water supplies.

- f. **Continue EPA's leadership role in advancing the development and implementation of biological criteria.** There is a growing recognition of the importance of biocriteria and bioassessment techniques in water quality protection and measuring the success of clean-up efforts. Biocriteria are particularly useful in advancing the scientific basis for designating aquatic life uses. They are also an "ecological check" to see whether regulation of individual chemicals is achieving expected results. OST will continue to work with other EPA offices to develop guidance and provide assistance.

**BIOLOGICAL ASSESSMENTS AND
CRITERIA MEASURE THE "HEALTH" OF
WATERS DIRECTLY**

- In the early 1970s the academic community conceived the idea of systematically assessing local aquatic biology with field studies and quantitative biological criteria.
- Several states (OH, MO, MI, NC, ME, NY) began testing and using this approach.
- EPA provided extensive technical guidance, policy recommendations and technical assistance.
- 47 states and 2 tribes now have active biological assessment programs.
- 5 states and 1 tribes have adopted biological criteria in water quality standards.
- 28 states are developing biocriteria for adoption in standards.

- g. **Complete and begin implementing the Strategy for Waterborne Microbial Disease.** As a result of increasing populations of humans and livestock within watershed areas, pathogens are the second most frequent cause of water quality impairments under the Clean Water Act. A number of initiatives such as the Interim Enhanced Surface Water Treatment Rule and the Beach Action Plan are important in reducing health risks from pathogens and will continue. OST with other participating offices is developing a strategy for future actions to integrate and expand programs to reduce adverse impacts of microbiological contamination in water. Specific goals include identifying priority activities for monitoring significant known pathogens and emerging pathogens, identifying and controlling pollutant sources to meet designated uses, coordinating regulatory and research activities, developing regulatory approaches, conducting research and development, and providing for participation of public agencies and stakeholders. OST is incorporating scientific and public comments into the 2001 draft microbial strategy. OST and ORD are already undertaking research on new indicators identified in the microbial strategy. Short- and long-term efforts will address concerns about future increases in microbial contamination and the potential for emergence of new threats to human health.
- h. **Continually update analytical methods to enable reliable detection of pollutants at levels near the criteria values.** Near-term emphasis will be on methods for measuring metals and other pollutants that appear most frequently in NPDES permit limitations. OST will develop methods for emerging pollutants on a priority basis as needed, including a method for the pollutant PBDE. See also the work on methods for bacterial indicators under 3.a.
- i. **Encourage applied research that could lead to further guidelines for contaminated sediments and water quality criteria to protect wetlands and**

wildlife. OST, ORD, and other EPA offices will oversee research to fill these important needs, including the use of biological assessments and criteria in setting biologically- or ecologically-based designated uses for aquatic life in wetlands, integrated pathway analyses in developing criteria to protect aquatic-dependent wildlife, and guidelines to protect benthic organisms.

The Work Plan in Attachment 2 on pages 28-29 shows the detailed steps and products to accomplish these strategic actions.

4. LINKING TO WATERSHED APPROACHES

The public is more involved in water quality issues, particularly with the growth of partnerships interested in restoring and maintaining specific watersheds. While these partnerships are making great strides in raising awareness of watershed problems and solutions, setting standards and verifying designated uses is often not a priority.

EPA is actively encouraging states, tribes, local and other federal partners to join in the protection of our waters at the watershed level, including estuaries and near-coastal waters fed by the watershed. By focusing on water resources holistically within a watershed, managers can better understand the cumulative impact of their activities, determine the most critical problems, better allocate limited financial and human resources, engage stakeholders, win public support, and make real improvements in the environment. Over the past 10 years, OW has encouraged watershed approaches not only for water programs (non-point sources, wetlands, permits, standards, drinking water and coastal programs) but also as a way to integrate efforts of sister agencies, states, tribes, local governments, industry and nonprofit organizations.

WATERSHED PARTNERS ARE HELPING PLAN WATER QUALITY PROTECTION

- EPA's Adopt Your Watershed program (www.epa.gov/adopt) and River Network (www.rivernetwork.org), a national nonprofit organization, both recognize over 3,000 local watershed groups. Citizens participate in these efforts because they are increasingly aware of watershed health.
- All states provide varied funding and technical assistance for watershed planning efforts.
- States such as WA, OR, NJ encourage watershed planning by supporting the establishment of local watershed councils.
- EPA's Volunteer Monitoring Program has registered over 800 local groups who routinely collect and analyze water quality and biological samples, and provide results to states and EPA.

Water quality standards can play an important role in watershed approaches, as standards serve the dual purposes of establishing water quality goals for specific water bodies and providing the regulatory basis for controls under the Clean Water Act. Community preferences and values for restoring our waters should be a key consideration in the public process of establishing designated uses and selecting ways to restore an ailing watershed. Nevertheless, a recent draft internal study, *A Review of Statewide Watershed Management Approaches* (EPA Office of Water, draft, February 2002) found that the water quality standards development

process is not significantly involved in any of the watershed management approaches of eight states studied but rather occurs primarily on a statewide basis. Several states indicated, however, that the statewide watershed approach has indirectly benefitted the water quality standards process by improving the level of communication about standards among state partners, increasing public understanding, and enhancing the state's ability to assess the need for revisions. Some states are also developing standards and criteria by eco-region or watershed.

These six strategic actions will better link water quality standards to watershed approaches at the state and local levels. These actions will support site-specific efforts to help solve water quality problems and will strengthen watershed stakeholders' understanding of the program, express community preferences for water quality standards, and build support for control actions.

- a. **Coordinate actions on standards and TMDLs and cross-train state, tribal and EPA staff in the two programs.** Coordination of standards and TMDL actions can be beneficial. For example, staff conducting triennial reviews of standards can benefit from the local knowledge of water quality gained in developing TMDLs. Similarly, staff developing TMDLs can benefit from detailed knowledge about the applicable water quality criteria and implementation provisions. OST with other EPA offices will develop guidance for improving the sequencing and coordination of TMDL development with water quality standards reviews and encourage coordination of these activities where information sharing can make the processes more efficient.
- b. **Evaluate whether drinking water uses have been adopted in water quality standards for source waters where needed and take action if gaps are found.** To help identify gaps, OST will work with other EPA offices to search geographically-referenced data bases containing intake locations and water quality standards to help identify any gaps in designated uses. OST and its partners will then develop policy and oversight approaches as needed to address the gaps. With appropriate designated uses in place, state and tribal drinking water criteria would apply where they are needed.
- c. **Provide additional guidance and technical tools for making scientifically-valid site-specific modifications of criteria.** Such guidance and tools, for example, would help states and tribes protect populations who consume a lot of fish and shellfish, and endangered and threatened species. OST will also consider any specific

CHALLENGES IN PROTECTING SURFACE-WATER SOURCES OF DRINKING WATER

- 180 million people use 14,136 public water systems that are supplied by surface water.
- The pesticide atrazine has been detected in over 90% of Ohio's public surface water systems and in similar percentages elsewhere.
- Concentrated animal feeding operations are believed to be among the major sources of microbial pathogens in drinking water.
- Conventional drinking water treatment systems are not fully effective for all pathogens and are ineffective for most pesticides like atrazine.

recommendations that the National Environmental Justice Advisory Committee provides in a report expected later in 2002 concerning protection of fish consumers.

- d. **Address the issue of inter-jurisdictional differences in water quality standards on shared waters.** Recent listings of impaired waters have highlighted some differences in standards and interpretations of standards at state lines. OST will work with other EPA offices and states to explore administrative and policy steps that could lead to a more systematic treatment of these issues.

**WATERSHEDS DON'T RECOGNIZE
POLITICAL BOUNDARIES**

Of the 2,165 watershed sub-basins in the lower 48 states:

- Almost all cross county lines.
- 667 (31%) contain parts of two or more states. The Lower Mississippi-Memphis sub-basin occupies parts of six states.
- 247 (11%) contain Indian reservations.
- 64 (3%) are shared with Canada or Mexico.

- e. **Encourage states to use watershed approaches and support early consideration of water quality standards in the watershed planning process.** OST will work with other EPA offices, states and watershed groups to better link water quality standards activities with watershed efforts. OST will develop education and training materials designed for watershed partnerships that emphasize the relationship between standards and the control actions that restore and maintain water bodies.
- f. **Promote increased use of biological criteria and ecological evaluation with other criteria types to address watershed-level protection.** Considering the interrelationships between chemical, physical and biological elements, these scientific tools can help define and measure a "healthy watershed." These efforts will extend beyond biological criteria and consider ways to reflect watersheds' natural structure and processes, including physical ecosystem characteristics such as stream channel structure and function and riparian zone conditions. The use of these "eco-criteria" to establish measures of watershed health and condition that reflect natural physical, chemical and biological processes will be investigated. OST will help states and tribes set biologically, and if appropriate, ecologically- based refinements in designated uses and will identify additional examples and possible avenues of research. Where useful approaches are identified, OST will sponsor or co-sponsor development of guidance materials.

The Work Plan in Attachment 2 on page 30 shows the detailed steps and products to accomplish these strategic actions.

5. BUILDING CAPACITY AND SHARING INFORMATION

An effective national program of water quality standards and criteria depends heavily on the skills and knowledge base of water quality professionals in states, tribes and EPA. It is important to help build that capacity. Participants in listening sessions generally appreciated EPA's Water Quality Standards Academies and Internet-based information sharing and encouraged their expansion and more advanced topics.

Information in the water quality standards and criteria program should not be solely from EPA. Creative ideas for solving problems and scientific information on important environmental issues related to standards and criteria arise every day in states, tribes, local governments and non-governmental organizations. Participants urged EPA to develop more opportunities for in-person dialog between standards and criteria professionals wherever they are, but especially between states and tribes and EPA.

The following five strategic actions will build capacity and share information among EPA, states and authorized tribes. These efforts will increase interactions at key points (such as triennial reviews), foster more exchanges between standards and criteria professionals, and continue to build the capability of regions, states, tribes and stakeholders to address standards and criteria issues.

- a. **Obtain early EPA, FWS and NMFS involvement in state and tribal reviews of standards.** Issues concerning endangered and threatened species have often slowed EPA's review of submitted standards. These problems could be minimized if the agencies could agree on the right approaches before states and tribes start to review and revise their standards. Under the 2001 Memorandum of Agreement, EPA agreed to work with the FWS and NMFS to give early input to triennial reviews. OST will work with other EPA offices to guide and support states and authorized tribes in adopting approvable criteria to protect listed species.
- b. **Sponsor meetings, workshops and electronic dialogues with stakeholders to assist in developing and implementing EPA policies and guidance.** OST will use open processes throughout the program, building on processes used to develop nutrient criteria and the implementation guidance for bacterial criteria.
- c. **Establish a clearinghouse for states, tribes and EPA to share information on policies, guidance, criteria and implementation approaches.** A clearinghouse would be particularly useful for emerging issues where other states have already had success in specific areas and where discussions between EPA, states and tribes could foster creative solutions. OST will conduct a feasibility study first to identify ways to provide cost-effective clearinghouse function.

d. **Expand Water Quality Standards Academies and other training.**

OST will develop new modules and more advanced training and expand outreach to broader audiences. OST will work with other EPA offices to better integrate water quality training among programs, especially Internet-based training.

e. **Maintain and expand on-line services and data bases.**

Participants encouraged OST to develop more EPA web sites such as those containing all state and tribal water quality standards effective under the Act and those with interactive geographic information systems that link state and tribal standards to individual water bodies.

HIGH DEMAND FOR TRAINING AND WORKSHOPS

Since 1993:

- Over 2,400 professionals have been trained in EPA's Water Quality Standards Academies. EPA turns away more students than it can train in these popular and well-regarded classes.
- Over 2,000 people have attended national or regional EPA workshops on water quality standards and criteria

The Work Plan in Attachment 2 on page 31 shows the detailed steps and products to accomplish these strategic actions.

Roles of EPA Offices and Key Partners During Implementation

Within EPA, the offices with primary responsibility for the water quality standards and criteria program are OST and EPA's ten regional offices. Other EPA offices play important roles in developing and implementing water quality standards, including OW offices responsible for monitoring, assessments, TMDLs, permits, wetlands, oceans, and drinking water, as well as the Office of Research and Development and the Office of General Counsel. OST will establish work groups with representatives from the regions and these other offices to implement the work plan for the 28 strategic actions.

The ten EPA regional offices have an important and special role in the water quality standards and criteria program. OST will work with its regional counterparts to develop a flexible system for administering the water quality standards program, including but not limited to the strategic actions. The system should recognize geographic and ecological differences and still maintain minimum requirements and levels of consistency nationwide. For example, OST staff could generally focus on issues having national significance while EPA regional offices could take the lead on local, site-specific issues. Additionally, EPA regional offices can help integrate water quality monitoring with water quality standards activities, including using environmental information to help target standards actions and assisting in correctly interpreting standards when making attainment decisions. Examples of important activities undertaken by EPA regional offices include serving as liaisons to states and tribes; helping states and tribes develop additions and revisions to their standards that are consistent with federal requirements and address high-priority needs; providing region-specific guidance where needed on specific standards development and implementation issues; developing criteria guidance for regionally-important pollutants; guiding priorities for triennial reviews; reviewing and approving new and revised water quality standards; and coordinating with the regional and district offices of the Fish and Wildlife Service and the National Marine Fisheries Service regarding endangered and threatened species issues.

Implementing this strategy will also require greater coordination and cooperation between EPA and key external partners than in previous years. Recent cooperative efforts should continue, adjusting for lessons learned in the process. These recent efforts include:

- Using Regional Technical Assistance Groups in developing EPA's recommended criteria for nutrients. These groups, consisting of technical staff from EPA regions and states as well as other researchers, work at the regional level to assemble environmental data and develop analytical approaches. In the future, these groups may be more involved in implementation issues as states and authorized tribes develop nutrient criteria plans and adopt nutrient criteria.
- Using a state/EPA technical work group to help develop implementation guidance for EPA's recommended criteria for methylmercury. This group is exploring options for deriving water quality-based effluent limitations and TMDL target values from the EPA criteria expressed as fish tissue contamination levels.

- Using a combination of public comments, public forums, and existing state/EPA operations committees and work groups to review the draft implementation guidance for bacterial criteria. These forums have not only provided channels for communicating scientific information but have also enabled OST to identify and address emerging issues not considered in the 2001 draft guidance.
- Establishing a public symposium in June 2002 to obtain views and ideas on designated use issues in water quality standards. The symposium will build on a workshop OST conducted in 2001 with several states and should provide valuable insights and ideas.
- Using quality-assured data generated by non-governmental parties where possible and appropriate for development of water quality criteria. Such data need to adhere to EPA protocols. EPA retains the governmental responsibility to establish the protocols, review the results, conduct peer review, and issue the criteria as federal recommendations.

OST will continue to engage the scientific community and the public in criteria development. OST will continue the practice of notifying the public when starting a new criteria document or reassessing an existing criteria document and of seeking scientific data and information. OST will also continue to seek peer review of resulting criteria and make those draft criteria available to the public at the same time for further technical input. This approach will help EPA publish water quality criteria reflecting the latest scientific knowledge.

Additionally, OST will utilize open public processes wherever possible. For example, OST may use public symposiums, meetings of professional societies and other open forums to obtain information and ideas for guidance documents. OST will also continue to coordinate EPA-sponsored research activities with the strategic actions in this strategy.

Future Strategy Refinements

OST is implementing several of the strategic actions identified in the early years of the work plan attached to this draft strategy (Attachment 2). As implementation experience grows, OST may revise the strategy as determined by need over time. In revising the strategy, OST will again seek input from our many partners and the public.

Conclusion

Water quality standards and criteria are the foundation of water quality protection programs under the Clean Water Act and the Safe Drinking Water Act. Water quality standards and criteria issues facing such programs as assessments, TMDLs and permits are increasingly complex. The 28 strategic actions in this draft strategy will strengthen that foundation, and fill critical gaps and implementation needs to deal with uncertainty and complexity, and help attain clean water goals.

Carrying out the strategy will require joint efforts among EPA and its partners and will also entail creativity and new approaches. Partners will have key roles in developing products and implementing the work plan. As implementation continues, OST may periodically make mid-course corrections to keep the strategy current and focused.

Acronyms

ASIWPCA means the Association of State and Interstate Water Pollution Control Administrators.

EPA means the U.S. Environmental Protection Agency.

NPDES means the National Pollutant Discharge Elimination System, established by section 402 of the Clean Water Act.

ORD means EPA's Office of Research and Development.

OST means the Office of Science and Technology in EPA's Office of Water.

OW means EPA's Office of Water..

TMDL means total maximum daily load. States develop total maximum daily loads for certain waterbodies that do not attain applicable water quality standards. See section 303(d) of the Clean Water Act.

Acknowledgments

This draft strategy was developed by a team consisting of Fred Leutner, EPA Office of Science and Technology, Washington, DC (team leader); Heidi Bell, EPA Office of Science and Technology, Washington, DC; Libby Chatfield, West Virginia Environmental Quality Board, Charleston WV; Catherine Kuhlman, EPA Region 9, San Francisco, CA; Cara Lalley, EPA Office of Science and Technology, Washington, DC; Joseph Piotrowski, EPA Region 3, Philadelphia, PA; and Deborah Smith, California Regional Water Quality Control Board, Los Angeles CA.

OST wishes to thank the following organizations for participating in the development of the draft strategy: water quality managers and water quality standards experts from the states of Arizona, California, Connecticut, Florida, Illinois, Kansas, New York, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Washington and West Virginia; the Association of State and Interstate Water Pollution Control Administrators; Water Division Directors and program staff in EPA Regions 1 through 10; EPA headquarters program managers for the NPDES program, TMDL program, Safe Drinking Water Act programs, wetlands programs, oceans programs and water law counsel; the Federal-State Toxicology and Risk Assessment Committee; the Federal Water Quality Coalition; the Water Environment Federation; the Association of Metropolitan Sewerage Agencies; the Clean Water Network and its participating members; the Utility Water Act Group; and the Electric Power Research Institute.

Information Sources for This Strategy

States

- S State water quality managers and water quality standards experts, particularly those from the states of Arizona, California, Connecticut, Florida, Illinois, Kansas, New York, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Washington and West Virginia.

EPA

- S EPA water program staff, including directors, managers and staff with responsibility for water quality standards, water quality monitoring and assessments, TMDLs, NPDES permits and drinking water in each of EPA's ten regional offices.
- S EPA program managers in headquarters for the NPDES program, TMDL program, Safe Drinking Water Act programs, wetlands programs, oceans programs and water law counsel.
- S Meeting of EPA headquarters and regional TMDL, NPS and assessment/monitoring coordinators, Albuquerque NM, June 4-7, 2001.

Stakeholders, State Program-Specific Groups and Other Input

- S ASIWPCA TMDL Conference (Regions 5, 6 and 7), Austin TX, April 18 - 20, 2001.
- S Meeting with Federal-State Toxicology and Risk Assessment Committee, May 22, 2001.
- S Meeting with Federal Water Quality Coalition, May 30, 2001, June 28, 2001.
- S Conference call with State/EPA TMDL Coordinators, July 13, 2001.
- S Meeting with Water Environment Federation, July 17, 2001.
- S Meeting with Association of Metropolitan Sewerage Agencies, August 23, 2001.
- S Meeting with Clean Water Network, August 28, 2001.
- S Letter from American Fisheries Society, September 13, 2001.
- S Letter from Clean Water Network, September 21, 2001.

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- EPA, Office of Water, *Developing Strategy for Waterborne Microbial Disease*, August 29, 2001.
- EPA, Office of Wetlands, Oceans and Watersheds, February 2, 2002, *A Review of Statewide Watershed Management Approaches*, executive summary in draft.
- EPA, National Environmental Justice Advisory Committee, Fish Consumption Workgroup, draft reports, February 25, 2002.
- National Research Council, Water Science and Technology Board, *Assessing the TMDL Approach to Water Quality Management*, June 22, 2001.

Other Sources of Information:

- Regular meetings of the State/EPA Operations Committee.
- Regular meetings of the State/EPA Work Group on Water Quality Standards.
- Regular meetings of the EPA Tribal Operations Committee and the Tribal Caucus of the committee.

Draft Strategy for Water Quality Standards and Criteria Work Plan

This work plan shows detailed steps and products for each of the 28 strategic actions of the draft strategy over the next seven years. The work plan shows the expected year for delivery of final products (the symbol "P") and the expected years for ongoing actions (the symbol "X"). For internal accountability, the plan shows responsible EPA headquarters office(s). The Remarks column shows mandated or recommended actions, and other comments. OST intends to update this work plan as determined by need over time.

EPA Product	Schedule (calendar year)							Remarks	Responsible HQ Office			
	01	02	03	04	05	06	07			08	TBD	
1. CLARIFYING PROGRAM REQUIREMENTS												
a. Develop clear guidance and provide ongoing support for state and tribal programs to adopt the highest attainable designated uses. S Workshop, symposium to help develop guidance S Draft and final guidance (in phases) S Case studies, model UAAs, training S Expand 1995 interim economic guidance S Promote routine reviews of designated uses to consider highest attained and attainable uses ..	P	P								- Recommended by National Research Council report on TMDLs, - Recommended by OW's Program Integration Team.	SHPD OGWDW	
b. Develop guidance on the recommended procedures for implementing antidegradation policies S Resolve current litigation and promulgation issues, and disseminate results S Draft and final guidance		X	X								SHPD	
c. Target federal corrective actions to address key environmental problems, and streamline reviews, approvals and disapprovals of submitted standards. S Work with regions and other EPA programs (e.g., TMDLs, permits, wetlands, oceans) to identify key problems (e.g., important missing criteria, major interstate inconsistencies, significant unprotected waters) S Take targeted corrective actions S Support regional WQS reviews in order to reduce backlogs in EPA actions*		X	X	X	X	X	X	X	X		*Backlog reduction commitments by Office of Water under Federal Managers Financial Integrity Act.	SHPD HECD
d. Review and update the 1994 WQS Handbook S Evaluate alternative formats and select best approach for updating S Publish revised update					P				P		SHPD HECD	

EPA Product	Schedule (calendar year)									Remarks	Responsible HQ Office
	01	02	03	04	05	06	07	08	TBD		

2. ENHANCING IMPLEMENTATION GUIDANCE AND INTEGRATION

<p>a. Develop implementation guidance for new and existing water quality criteria where necessary, including guidance for measuring attainment and applying criteria in TMDLs and permits.</p> <p>S Guidance on measuring attainment for new and existing water quality criteria, focusing on duration/frequency component of criteria</p> <p>S Guidance for bacteria, nutrients (see 3a, 3b)</p> <p>S Guidance for methyl mercury</p> <p>S Guidance for new criteria as needed, existing criteria on priority basis</p>											- Recommended by OW's Program Integration Team.	SHPD HECD OWM OWOW ORD	
<p>b. Develop implementation guidance on specific issues affecting the target levels in TMDLs and water quality-based effluent limits in NPDES permits</p> <p>S Flow considerations in developing wasteload allocations</p> <p>S Mixing zones</p> <p>S Water quality modeling tools and analyses, including wet-weather</p> <p>S Variances</p> <p>S Compliance schedules</p> <p>S Application of narrative criteria</p> <p>S Stormwater and related wet-weather issues . . .</p> <p>S Contaminated sediments</p>		X	X	P	P								SHPD
<p>c. Complete the national consultation with the federal Services on existing water quality criteria and resolve recurrent issues concerning water quality standards and protection of endangered and threatened species</p> <p>S National consultation on existing aquatic life criteria</p> <p>S Joint agreement on efficient, effective ways to consult on standards, TMDLs, permits</p> <p>S Develop EVISTRA database and tools</p> <p>S Cross-training for EPA, Service staff</p>	X	X	X	P								- Specified in memorandum of agreement with FWS, NMFS. - Recommended by 2000 EPA IG report. - Recommended by 2000 OST standards program evaluation.	SHPD HECD ORD OWOW OWM
<p>d. Integrate drinking water, pesticides and other program needs with Clean Water Act needs when developing and revising water quality criteria.</p> <p>S Coordinate contaminant selection for MCLGs and 304(a) criteria</p> <p>S Integrate needs, capabilities across programs in 304(a) work plan</p>	X	X	X	X	X	X	X	X	X			- Recommended by OW's Program Integration Team	HECD OGWDW OPP

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EPA Product	Schedule (calendar year)									Remarks	Responsible HQ Office
	01	02	03	04	05	06	07	08	TBD		

3. STRENGTHENING AND MAINTAINING THE SCIENTIFIC FOUNDATION

<p>a. Provide additional guidance and assistance in implementing criteria for bacteria</p> <p>S Implementation guidance - final P</p> <p>S §136 analytical method for ambient water (proposed, final) P</p> <p>S §136 analytical method for wastewater (proposed, final) P P</p> <p>S Conduct training on beach methods X X X X X</p> <p>S Workshops (e.g., health effects, mixtures) X X X X X</p>												SHPD HECD EAD
<p>b. Provide additional guidance and assistance in implementing criteria for nutrients and continue to publish nutrient criteria.</p> <p>S Guidance on developing a nutrients plan P</p> <p>S Review state and tribal nutrient plans P X X X</p> <p>S Technical manual for estuary and coastal waters P P</p> <p>S Technical manual for wetlands P P</p> <p>S Assessment, TMDL and permitting guidance for nutrients (including case studies) P</p> <p>S 28 criteria documents for lakes and rivers P P</p> <p>S 7 documents for wetlands P P P</p> <p>S 6 criteria documents for estuary and coastal waters P P P</p>												SHPD HECD
<p>c. Coordinate research efforts on waterbody sedimentation and develop a criteria methodology.</p> <p>S Develop guidance for TMDLs* X X X X X X X X X</p> <p>S Oversee research and development efforts X X X X X P X X</p> <p>S Develop criteria methodology P</p> <p>S Develop criteria guideline P</p>												HECD OWOW ORD *OWOW products
<p>d. Develop new and revised aquatic life criteria using the 1985 methodology and update important features of that methodology</p> <p>S Criteria for cadmium* P P</p> <p>S Criteria for atrazine P</p> <p>S Criteria for cadmium (biotic ligand model pilot), diazinon, nonylphenol, selenium* P</p> <p>S Criteria for methyl-tertiary butyl ether, tributyltin, iron, lead, metals effects on mussels* TBD</p> <p>S Criteria for other chemicals selected by ranking process TBD</p> <p>S Minimum flow criteria for aquatic habitat TBD</p> <p>S Biotic ligand model to assess acute toxicity of metals based on bioavailable fraction and site-specific chemistry* TBD</p> <p>S Update features of 1985 criteria methodology such as: producing criteria with limited data, addressing food chain and bioaccumulation effects, selecting test species, considering additional end points, considering duration and frequency in developing new criteria, addressing chemical mixtures TBD</p> <p>S Develop principles for aquatic life risk assessment and protection TBD</p>												*These items specified by terms of ESA consultations. HECD ORD

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	01	02	03	04	05	06	07		

3. STRENGTHENING AND MAINTAINING THE SCIENTIFIC FOUNDATION (continued)

<p>e. Provide technical guidance for implementing the 2000 methodology for human health criteria and develop new criteria for important pollutants based on that methodology.</p> <p>S Bioaccumulation technical support document</p> <p>S Exposure assessment technical support document</p> <p>S Bioaccumulation field guidance manual</p> <p>S Policy guidance on MCLGs vs. 304(a) criteria</p> <p>S Criteria for arsenic, chloroform</p> <p>S Criteria for other pollutants ranked by selection process (see 2d. above)</p>			P																HECD OGWDW SHPD				
<p>f. Continue EPA's leadership role in advancing the development and use of biological criteria.</p> <p>S Wetland methods and indicators</p> <p>S Case study on biocriteria in enforcement</p> <p>S Statistics for biocriteria development</p> <p>S Technical guidance on tiered aquatic life uses</p> <p>S Update survey of state and tribal biocriteria programs</p> <p>S Stressor Identification guidance phase II</p> <p>S Coral reef methods</p> <p>S Large river methods</p> <p>S Support implementation for streams and small rivers</p> <p>S Workshops and clinics to assist implementation</p>		P																		- Recommended by National Research Council report on TMDLs.	HECD ORD OWOW OECA SHPD		
<p>g. Complete and begin implementing the Strategy for Waterborne Microbial Disease</p> <p>S Publish, update and implement strategy</p> <p>S Criteria assessment (NAS Study)</p> <p>S Develop new water quality criteria for microbes</p> <p>S Develop EPA risk assessment guidelines</p> <p>S Workshops (e.g., indicators)</p>		P	X	X	X	X	X															HECD	
<p>h. Continually update analytical methods to enable reliable detection of pollutants at levels near the criteria values.</p> <p>S Guidance method for methyl-Hg in tissue</p> <p>S §136 rules for bacteria (see 3a. above)</p> <p>S §136 rule for method #1638 for ten metals (proposed, final)</p> <p>S §136 rule for PBDE (proposed, final)</p> <p>S Other methods as needed</p>		P																				- Recommended by OW's Program Integration Team.	EAD
<p>i. Encourage applied research that could lead to further guidelines for contaminated sediments and water quality criteria to protect wetlands and wildlife.</p> <p>S Chromium addendum to sediment guidelines for metal mixtures*</p> <p>S Publication of sediment guideline documents</p> <p>S Hydrological and possibly chemical-specific criteria for wetlands</p> <p>S Coordinate research efforts on wildlife criteria</p>				P																		*This item is specified by terms of ESA consultations.	HECD ORD OWOW

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4. LINKING TO WATERSHED APPROACHES

<p>a. Coordinate actions on standards and TMDLs and cross-train state, tribal and EPA staff in the two programs</p> <p>S Improve coordination of WQS reviews, TMDLs</p> <p>S Guidance for improving the sequencing and coordination of TMDL development with water quality standards reviews</p> <p>S Provide cross-training for TMDL and WQS practitioners to address WQS issues when developing TMDLs</p>		X	X	X	X			X	X		- Recommended by National Research Council report on TMDLs. - Recommended by Program Integr. Team.	SHPD	
<p>b. Evaluate whether drinking water uses have been adopted in water quality standards for source waters where needed and take action if gaps are found.</p> <p>S Conduct evaluation</p> <p>S Develop policy and oversight approach</p>			P							TBD	- Recommended by OW's Program Integration Team.	OGWDW SHPD	
<p>c. Provide additional guidance and technical tools for making scientifically-valid site-specific modifications of criteria.</p> <p>S Streamlined water effect ratio guidance manual</p> <p>S Clarification to 1994 WER guidance concerning Ca/Mg ratios and acclimation of test species to laboratory water*</p> <p>S Guidance on deriving site-specific criteria to protect endangered and threatened species*</p> <p>S Guidance on hardness caps for metals criteria</p> <p>S Guidance for reviewing toxicity studies for use in aquatic life criteria derivation</p> <p>S Guidance on adapting and implementing WQS for intermittent, ephemeral, and effluent dependent waters</p> <p>S Tools and tech. assistance for applying guidance</p> <p>S Assist use of performance-based provisions in state and tribal standards</p> <p>S Expand guidance, tools for addressing fish consumption rate issues in standards**</p>	P										*These two items are specified by terms of ESA consultations. **Draft recommendation of National Environmental Justice Advisory Committee.	HECD SHPD	
<p>d. Address the issue of inter-jurisdictional differences in water quality standards on shared waters.</p> <p>S Develop a strategic approach to address major interstate inconsistencies</p> <p>S Develop mapping tools to identify areas</p>										TBD TBD		SHPD OWOW OWM	
<p>e. Encourage states to use watershed approaches and support early consideration of water quality standards in the watershed planning process.</p> <p>S Develop liaisons and cooperative agreements with national watershed groups</p> <p>S Develop outreach materials for watershed partnerships</p> <p>S Develop training programs</p>				X	X	X	X	X	X			TBD	
<p>f. Promote increased use of biological criteria and ecological evaluation with other criteria types to address watershed-level protection.</p> <p>S Identify case examples, possible research</p> <p>S Develop guidance materials</p>									P			TBD	

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	01	02	03	04	05	06	07	08	TBD.		

5. BUILDING CAPACITY AND SHARING INFORMATION

a. Obtain early EPA, FWS, NMFS involvement in state and tribal reviews of standards		X	X	X	X	X	X	X	X			
b. Sponsor meetings, workshops and electronic dialogues with stakeholders to assist in developing and implementing EPA policies and guidance. S EPA coordinator meetings S Conference calls S Expand workshops of Federal-State Toxicology and Risk Assessment Committee (FSTRAC) S Nutrient criteria workshops S Biological criteria workshops S National symposiums S Technical workshops (national or regional)		X	X	X	X	X	X	X	X			SHPD HECD
c. Establish a clearinghouse for states, tribes and EPA to share information on policies, guidance, criteria, and implementation approaches. S Feasibility study S Implementation											P	SHPD
d. Expand Water Quality Standards Academies and other training. S Basic Academy (on-site classroom sessions) S Basic Academy (static training materials web) S Intermediate Academy (distance learning or on-site) S Update business plan to reflect greater reliance on distance learning S Coordinate training plans with other water offices S Add or expand Academy modules, such as bacteria, Beach Act, Fish and shellfish, standards reviews, antidegradation, marine dissolved oxygen, nutrients, methyl mercury, ESA, tribal issues, EPA approval/disapproval process S Implement upgraded distance learning options S Provide cross-training for staff in related programs such as assessment, TMDLs, permits, wetlands, oceans (see also strategic actions 2.c. and 4.a.)	X	X	X	X	X	X	X	X	X			SHPD
e. Maintain and expand on-line services and data bases S Maintain repository of state, tribal, and federal standards effective under the Clean Water Act* S Expand and maintain on-line database of geographically-referenced state, tribal, and federal designated uses and criteria	X	X	X	X	X	X	X	X	X			*EPA commitment in implementing Alaska rule. SHPD

Responsible headquarters offices in EPA:
 SHPD = Standards and Health Protection Division, OST
 HECD = Health and Ecological Criteria Division, OST
 EAD = Engineering and Analysis Division, OST
 OWOW = Office of Wetlands, Oceans and Watersheds, Office of Water
 OGWDW = Office of Ground Water and Drinking Water, Office of Water
 ORD = Office of Research and Development
 OPP = Office of Pesticides Programs, Office of Prevention, Pesticides and Toxic Substances

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