

## INTRODUCTION

### HISTORY OF THE WATER QUALITY STANDARDS PROGRAM

#### Statutory History

The first comprehensive legislation for water pollution control was the Water Pollution Control Act of 1948 (Public Law 845, 80th Congress). This law, passed after a half century of debate on the responsibility of the Federal Government for resolving water pollution problems, adopted principles of State-Federal cooperative program development, limited Federal enforcement authority, and provided limited financial assistance. These concepts were continued in the Federal Water Pollution Control Act (FWPCA) of 1956 (Public Law 660, 84th Congress) and in the Water Quality Act of 1965. Under the 1965 Act, States were directed to develop water quality standards for interstate waters. As a result of enforcement complexities and other problems, however, this approach was not sufficiently effective. In the FWPCA Amendments of 1972 (Public Law 92-500), Congress established a discharge permit system and provided a broader Federal role through more extensive Federal grants to finance local sewage treatment systems and through Federal (EPA) setting of technology-based effluent limitations. The 1972 Amendments extended the water quality standards program to intrastate waters and provided for implementation of water quality standards through discharge permits.

Section 303(c) of the 1972 FWPCA Amendments (33 USC 1313(c)) established the statutory basis for the current water quality standards program. It completed the transition from the previously established program of water quality standards for interstate waters to one requiring standards for all surface waters of the United States.

Although the major innovation of the 1972 FWPCA was technology-based controls, Congress maintained the concept of water quality standards both as a mechanism to establish goals for the Nation's waters and as a regulatory requirement when standardized technology controls for point source discharges and/or nonpoint source controls were inadequate. In recent years, Congress and EPA have given these water quality-based controls new emphasis in the continuing quest to enhance and maintain water quality to protect the public health and welfare.

Briefly stated, the key elements of section 303(c) are as follows:

- (1) A water quality standard is defined as the designated beneficial uses of a water segment and the water quality criteria necessary to support those uses;
- (2) The minimum beneficial uses to be considered by States in establishing water quality standards are specified as public water supplies, propagation of fish and wildlife, recreation, agricultural uses, industrial uses, and navigation;
- (3) A requirement specifies that State standards must protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act;
- (4) A requirement specifies that States must review their standards at least once each 3-year period using a process that includes public participation;

- (5) The process is described for EPA review of State standards that might ultimately result in the promulgation of a superseding Federal rule in cases where a State's standards are not consistent with the applicable requirements of the CWA, or in situations where the Agency determines that Federal standards are necessary to meet the requirements of the Act.

The Federal Water Pollution Control Act, including the major 1977, 1981, and 1987 Amendments are commonly referred to as the "Clean Water Act" (the Act or CWA).

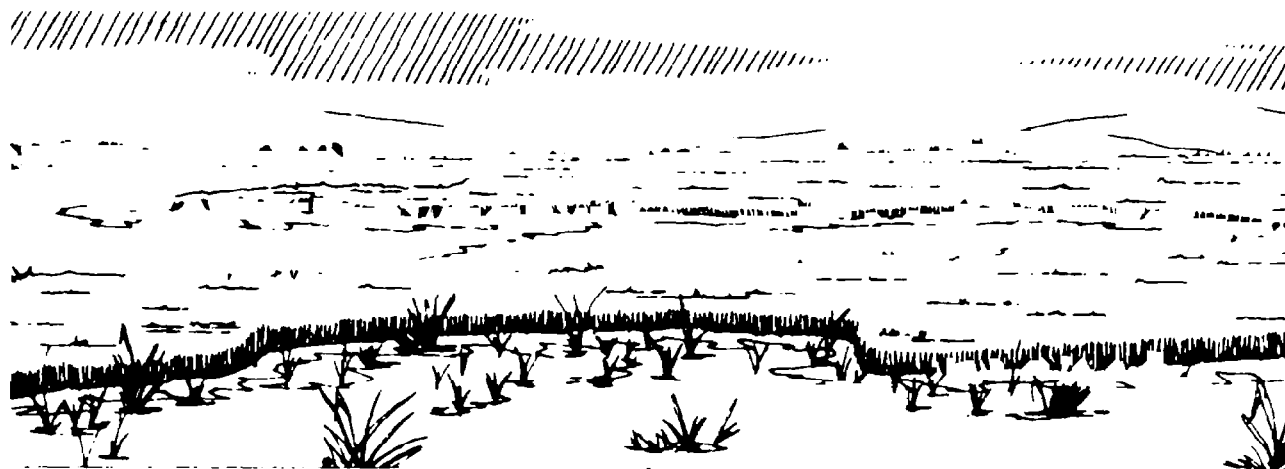
On February 4, 1987, Congress enacted the Water Quality Act of 1987 (Public Law 100-4), making substantial additions to the Clean Water Act and directly affecting the standards program. Congress concluded that toxic pollutants in water constitute one of the most pressing water pollution problems. The Water Quality Act provided a new approach to controlling toxic pollutants by requiring ". . . States to identify waters that do not meet water quality standards due to the discharge of toxic substances, to adopt numerical criteria for the pollutants in such waters, and to establish effluent limitations for individual discharges to such water bodies" (from Senator Mitchell, 133 Congressional Record S733). As now amended, the Clean Water Act requires that States adopt numeric criteria for toxic pollutants listed under section 307(a) of the Clean Water Act for which section 304(a) criteria have been

published, if the presence of these pollutants is likely to adversely affect the water body's use. Guidance on these changes is discussed in detail in section 3.4 of this Handbook. Additionally, for the first time, the Act explicitly recognizes antidegradation (see section 303(d)(4) of the Act).

### Regulatory History

EPA first published a water quality standards regulation in 1975 (40 CFR 130.17, promulgated in 40 F.R. 55334, November 28, 1975) as part of EPA's water quality management regulations, mandated under section 303(e) of the Act. The first Water Quality Standards Regulation did not specifically address toxic pollutants or any other criteria. It simply required "appropriate" water quality criteria necessary to support designated uses.

In the late 1970s and early 1980s, the public and Congress raised concerns about toxic pollutant control. EPA realized that promulgating effluent guidelines or effluent standards under section 307 of the Act would not comprehensively address toxic pollutants. So, EPA decided to use the statutory connection between water quality standards and NPDES permits provided by section 301(b)(1)(C) to effectively control a range of toxic pollutants from point sources. To best accomplish this process, the Agency decided to amend the Water Quality Standards Regulation to explicitly address toxic criteria requirements in State



standards. Other legal and programmatic issues also necessitated a revision of the Standards Regulation. The culmination of this effort was the promulgation of the present Water Quality Standards Regulation on November 8, 1983 (54 F.R. 51400).

The present Water Quality Standards Regulation (40 CFR Part 131) is a much more comprehensive regulation than its predecessor. In subpart B, the Regulation addresses both the designated use component and the criteria component of a water quality standard. Section 131.11 of the Regulation requires States to review available information and ". . . to identify specific water bodies where toxic pollutants may be adversely affecting water quality . . . and must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use." The Regulation provides that either or both numeric and narrative criteria may be appropriately used in water quality standards.

Since the middle of the 1980's, EPA's annual program guidance to the States reflected the increasing emphasis on controlling toxics. States were strongly encouraged to adopt criteria in their standards for the pollutants listed pursuant to section 307(a) of the Act, especially where EPA has published criteria guidance under section 304(a) of the Act.

State reaction to EPA's initiative was mixed. Several States proceeded to adopt large numbers of numeric toxic pollutant criteria, although primarily for the protection of aquatic life. Other States relied on a narrative "free from" toxicity criterion, using so-called "action levels" for toxic pollutants or for calculating site-specific criteria. Few States specifically addressed human health protection outside the National Primary Drinking Water Standards promulgated under the Safe Drinking Water Act.

In support of its 1983 regulation, EPA simultaneously issued program guidance entitled *Water Quality Standards Handbook* (December 1983). The foreword to the guidance noted that

EPA's approach to controlling toxics included both chemical-specific numeric criteria and biological testing in whole-effluents or ambient waters. More detailed programmatic guidance on the application of biological testing was provided in the *Technical Support Document for Water Quality-based Toxics Control* (EPA 44/4-85-032, September 1985). This document provides the information needed to convert chemical-specific and biologically based criteria into permit limits for point source dischargers.

State water quality standards reviews submitted began to show the effects of EPA's efforts. More and more numeric criteria for toxics were being included in State standards as well as more aggressive use of the "free from toxics" narratives in setting protective NPDES permit limits. However, because of perceived problems in adopting numeric toxic pollutant criteria in State rulemaking proceedings, many States were reluctant to adopt numeric toxics criteria. Thus, in 1987, Congress responded to the lack of numeric criteria for toxic pollutants within State standards by mandating State adoption of such criteria.

In response to this new congressional mandate, EPA redoubled its efforts to promote and assist State adoption of water quality standards for priority toxic pollutants. EPA's efforts included the development and issuance of guidance to the States on December 12, 1988, which contained acceptable implementation procedures for several new sections of the Act, including sections 303(c)(2)(B).



EPA, in devising guidance for section 303(c)(2)(B), attempted to provide States with the maximum flexibility that complied with the express statutory language but also with the overriding congressional objective: prompt adoption and implementation of numeric toxics criteria. EPA believed that flexibility was important so that each State could comply with section 303(c)(2)(B) and to the extent possible, accommodate its existing water quality standards regulatory approach. The options EPA identified are described in section 3.4.1 of this Handbook.

EPA's December 1988 guidance also addressed the timing issue for State compliance with section 303(c)(2)(B). The statutory directive was clear: all State standards triennial reviews initiated after passage of the Act must include a consideration of numeric toxic criteria.

States significantly responded to the 1987 requirement for numeric criteria for toxic pollutants. For example, in 1986 on average, each State had 10 numeric criteria for freshwater aquatic life. By February 1990, the average number of freshwater aquatic life criteria was increased to 30. Also, States averaged 36 numeric criteria for human health in February 1990. However, by September 1990, many States had failed to fully satisfy the requirements of section 303(c)(2)(B).

The addition of section 303(c)(2)(B) to the Clean Water Act was an unequivocal signal to the States that Congress wanted toxics criteria in the State's water quality standards. EPA, consistent with this mandate, initiated Federal promulgation of toxic criteria for those States that had not complied with the Act. EPA proposed Federal criteria for toxic pollutants for 22 States and Territories, based on a preliminary assessment of compliance, on November 19, 1991 (56 F.R. 58420), and promulgated toxic criteria for 14 of those States on December 22, 1992 (57 F.R. 60848).

## HANDBOOK CHANGES SINCE 1983

In December, 1983, EPA published its first *Water Quality Standards Handbook*. The 1983 Handbook was designed to help States implement the Water Quality Standards Regulation as revised in November 1983 (48 F.R. 51400). Since then, Congress enacted the Water Quality Act of 1987 (Public Law 100-4), making substantial additions to the Clean Water Act (CWA) directly affecting the standards program. In response to the Water Quality Act of 1987, and as a result of Federal promulgation actions, EPA amended the Water Quality Standards Regulation several times (see Appendices A and B). Since 1983 EPA also issued additional guidance to assist in the implementation of the WQS Regulation. *Water Quality Standards Handbook - Second Edition* incorporates all the WQS guidance issued since the 1983 Handbook was published. A summary of these guidance documents are as follows.

### **EPA Guidance on the Water Quality Act of 1987**

On February 4, 1987, Congress enacted the Water Quality Act of 1987 (Public Law 100-4), making substantial additions to the Clean Water Act directly affecting the standards program. Section 303(c)(2)(B) of the Clean Water Act requires States to adopt numeric criteria for toxic pollutants listed under section 307(a) of the Clean Water Act for which section 304(a) criteria have been published, if the presence of these pollutants is likely to affect a water body's use. EPA published *Guidance for State Implementation of WQS for CWA section 303(c)(2)(B)* on December 12, 1988 (USEPA, 1988b). This guidance is incorporated into this Handbook at section 3.4.1.

The 1987 Act also added a new section 518, which requires EPA to promulgate a regulation specifying how the Agency will authorize qualified Indian Tribes to administer CWA programs including section 303 (water quality standards) and section 401 (certification) programs. Section 518 also requires EPA, in

promulgating this regulation, to establish a mechanism to resolve unreasonable consequences that may result from an Indian Tribe and a State adopting differing water quality standards on common bodies of water. EPA promulgated a final regulation on December 12, 1991 (56 F.R. 64875). Guidance on water quality standards for Indian Tribes is contained in chapter 1.

### **Other EPA Guidance**

Since 1983, EPA also developed additional policies and guidance on virtually all areas of the WQS Regulation. Following is a complete list of these guidance documents.

*State Water Quality Standards Approvals: Use Attainability Analysis Submittals* (USEPA, 1984d), clarifies EPA policy on several issues regarding approval of water body use designations less than the fishable/swimmable goal of the CWA. See section 6.2 for a discussion of this topic.

*Interpretation of the Term "Existing Use"* (USEPA, 1985e), expands on EPA's interpretation of when a use becomes an "existing use" as defined by the WQS Regulation. Discussion of "existing uses" is contained in section 4.4.

*Selection of Water Quality Criteria in State Water Quality Standards* (USEPA, 1985f), established EPA policy regarding the selection of appropriate water quality criteria for toxic pollutants in State water quality standards. This guidance preceded both the *Guidelines for Deriving Numerical National Water Quality Criteria for the for the Protection of Aquatic Organisms and Their Uses* (USEPA, 1985b), and the 1988 guidance on section 303(c)(2)(B) of the CWA, discussed above. Both of these later documents expand upon the February 1985 guidance, but the policy established therein

has not been substantively changed. Adoption of criteria for toxic pollutants is discussed in section 3.4.

*Variances in Water Quality Standards* (USEPA, 1985g), reinterprets the factors that could be considered when granting water quality standards variances. Variances are discussed in section 5.3.

*Antidegradation, Waste loads, and Permits* (USEPA, 1985h), clarifies that the antidegradation policy is an integral component of water quality standards and must be considered when developing waste load allocations and NPDES permits. Antidegradation is discussed in chapter 4.

*Questions and Answers on Antidegradation* (Appendix G), provides guidance on various aspects of the antidegradation policy where questions had arisen since the 1983 Regulation and Handbook were published.

*Antidegradation Policy* (USEPA, 1985i), reiterates the need for all States to have: (1) an antidegradation policy that fully complies with the Federal requirements, and (2) a procedure for consistently implementing that policy.

*Answers to Questions on Nonpoint Sources and WQS* (USEPA, 1986e), responded to two questions on nonpoint source pollution and water quality standards. The relationship between nonpoint source pollution and water quality standards is discussed in section 7.

*Determination of "Existing Uses" for Purposes of Water Quality Standards Implementation* (USEPA, 1986f), responds to concerns expressed to EPA on the interpretation of when a recreational use becomes an "existing use" as defined by the Regulation. Discussion of "existing uses" is contained in section 4.4.

*Nonpoint Source Controls and Water Quality Standards* (USEPA, 1987d), provides further guidance on nonpoint sources pollution and water quality standards reflecting the requirements of section 319 of the CWA as added by the 1987 CWA amendments.

*EPA Designation of Outstanding National Resource Waters* (USEPA, 1989f), restates the basis for EPA's practice of not designating State waters as Outstanding National Resource Waters (ONRW) where a State does not do so. ONRWs are discussed in section 4.6.

*Guidance for the Use of Conditional Approvals for State WQS* (USEPA, 1989g), provides guidelines for regional offices to use in granting State water quality standards approvals conditioned on the performance of specified actions by the State. Conditional approvals are discussed in section 6.2.3.

*Application of Antidegradation Policy to the Niagara River* (USEPA, 1989c), provides guidance on acceptable interpretations of the antidegradation policy to help attain the CWA objective to "restore and maintain" the integrity of the Nation's waters.

*Designation of Recreation Uses* (USEPA, 1989h), summarizes previously issued guidance, and outlines a number of acceptable State options for designating recreational uses. The use designation process is discussed in chapter 2.

*Biological Criteria: National Program Guidance for Surface Waters* (Appendix C), provides guidance on the effective development and application of biological criteria in the water quality standards program. Biological criteria are discussed in section 3.5.3.

*National Guidance: Water Quality Standards for Wetlands* (Appendix D), provides guidance for meeting the EPA priority to develop water quality standards for wetlands.

*Section 401 certification and FERC licenses* (USEPA, 1991h), clarifies the range of water quality standards elements that States need to apply when making CWA section 401 certification decisions. Section 401 of the CWA is discussed in section 7.6.3.

*Technical Support Document for Water Quality-based Toxics Control*, (USEPA, 1991a), provides technical guidance for assessing and regulating the discharge of toxic substances to the waters of the United States.

*Policy on the Use of Biological Assessments and Criteria in the Water Quality Program* (USEPA, 1991i), provides the basis for EPA's policy that biological surveys shall be fully integrated with toxicity and chemical-specific assessment methods in State water quality programs. Further discussion of this policy is contained in section 3.3.

*Numeric Water Quality Criteria for Wetlands* (Appendix E), evaluates EPA's numeric aquatic life criteria to determine how they can be applied to wetlands. Wetland aquatic life criteria are discussed in section 3.5.6.

*Endangered Species Act Joint Guidance* (Appendix F), establishes a procedure by which EPA, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service will consult on the development of water quality criteria and standards.

*Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria* (USEPA, 1993f), transmits Office of Water (OW) policy and guidance on the interpretation and implementation of aquatic life criteria for the management of metals. Section 3.6 discusses EPA's policy on aquatic life metals criteria.

*Interpretation of Federal Antidegradation Regulatory Requirement* (USEPA, 1994a), provides guidance on the interpretation of

the antidegradation policy in 40 CFR 131.12(a)(2) as it relates to nonpoint sources. Antidegradation and nonpoint sources are discussed in Section 4.6.

*Interim Guidance on Determination and Use of Water-Effect Ratios for Metals* (Appendix L), provides interim guidance concerning the experimental determination of water-effect ratios (WERs) for metals and supersedes all guidance concerning water-effect ratios and the Indicator Species Procedure in USEPA, 1983a and in USEPA, 1984f. It also supersedes the guidance in these earlier documents for the Recalculation Procedure for performing site-specific aquatic life criteria modifications. Site-specific aquatic life criteria are discussed in Section 3.7.

The guidance contained in each of the above documents is either incorporated into the text of the appropriate section of this Handbook or attached as appendices (see Table of Contents). The reader is directed to the original guidance documents for the explicit guidance on the topics discussed. Copies of all original guidance documents not attached as appendices may be obtained from the source listed for each document in the Reference section of this Handbook.

The *Water Quality Standards Handbook - Second Edition* is reorganized from the 1983 Handbook. An overview to Water Quality Standards and Water Quality Management programs has been added, and chapters 1 through 6 are organized to parallel the provisions of the Water Quality Standards Regulation. Chapter 7 briefly introduces the role of water quality standards in the water quality-based approach to pollution control.

The *Water Quality Standards Handbook - Second Edition* retains all the guidance in the 1983 Handbook unless such guidance was specifically revised in subsequent years.

## OVERVIEW OF THE WATER QUALITY STANDARDS PROGRAM

A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water, by setting criteria necessary to protect the uses, and by preventing degradation of water quality through antidegradation provisions. States adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act.

"Serve the purposes of the Act" (as defined in sections 101(a), 101(a)(2), and 303(c) of the Act) means that water quality standards:

- include provisions for restoring and maintaining chemical, physical, and biological integrity of State waters;
- wherever attainable, achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water ("fishable/swimmable"); and
- consider the use and value of State waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation.

Section 303(c) of the Clean Water Act provides the statutory basis for the water quality standards program. The regulatory requirements governing the program, the *Water Quality Standards Regulation*, are published at 40 CFR 131. The Regulation is divided into four subparts (A through D), which are summarized below.

### General Provisions (40 CFR 131 - Subpart A)

Subpart A includes the scope (section 131.1) and purpose (section 131.2) of the Regulation, definitions of terms used in the Regulation (section 131.3), State (section 131.4) and EPA (section 131.5) authority for water quality standards, and the minimum requirements for a

State water quality standards submission (section 131.6).

On December 12, 1991, the EPA promulgated amendments to Subpart A of the Water Quality Standards Regulation in response to the CWA section 518 requirements (see 56 F.R. 64875). The Amendments:

- establish a mechanism to resolve unreasonable consequences that may result from an Indian Tribe and a State adopting differing water quality standards on common bodies of water (section 131.7); and
- add procedures by which an Indian Tribe can qualify for the section 303 water quality standards and section 401 certification programs of the Clean Water Act (section 131.8).

The sections of Subpart A are discussed in chapter 1.

### Establishment of Water Quality Standards - (Subpart B)

Subpart B contains regulatory requirements that must be included in State water quality standards: designated uses (section 131.10), criteria that protect the designated uses (section 131.11), and an antidegradation policy that protects existing uses and high water quality (section 131.12). Subpart B also provides for State discretionary policies, such as mixing zones and water quality standards variances (section 131.13).

Each of these sections is summarized below and discussed in detail in chapters 2 through 5 respectively.

#### Designation of Uses

The Water Quality Standards Regulation requires that States specify appropriate water uses to be



achieved and protected by taking into consideration the use and value of the water body for public water supply, for propagation of fish, shellfish, and wildlife, and for recreational, agricultural, industrial, and navigational purposes. In designating uses for a water body, States examine the suitability of a water body for the uses based on the physical, chemical, and biological characteristics of the water body, its geographical setting and scenic qualities, and the social-economic and cultural characteristics of the surrounding area. Each water body does not necessarily require a unique set of uses. Instead, the characteristics necessary to support a use can be identified so that water bodies having those characteristics might be grouped together as supporting particular uses.

Any water body with standards not consistent with the section 101(a)(2) goals of the Act must be reexamined every 3 years to determine if new information has become available that would warrant a revision of the standard. In addition, the Regulation requires that where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained.

When reviewing uses, States must perform and submit to EPA a use attainability analysis if:

- either the State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act;
- the State wishes to remove a designated use that is specified in section 101(a)(2); or
- the State wishes to adopt subcategories of uses specified in section 101(a)(2) that require less stringent criteria than are currently adopted.

States may adopt seasonal uses as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent criteria. In no case may a State remove an existing use. No use

attainability analysis is required when designating uses that include those specified in section 101(a)(2) of the Act.

### Criteria Development and Review

States adopt water quality criteria with sufficient coverage of parameters and of adequate stringency to protect designated uses. In adopting criteria to protect the designated uses, States may:

- adopt the criteria that EPA publishes under section 304(a) of the Act;
- modify the section 304(a) guidance to reflect site-specific conditions; or
- use other scientifically defensible methods.

Section 131.11 encourages States to adopt both numeric and narrative criteria. Numeric criteria are important where the cause of toxicity is known or for protection against pollutants with potential human health impacts or potential for bioaccumulation. Narrative toxic criteria, based on whole-effluent toxicity (WET) testing, can be the basis for limiting toxicity in waste discharges where a specific pollutant can be identified as causing or contributing to the toxicity but there are no numeric criteria in the State standards or where toxicity cannot be traced to a particular pollutant. Whole-effluent toxicity testing is also appropriate for discharges containing multiple pollutants because WET testing provides a method for evaluating synergistic and antagonistic effects on aquatic life.

Section 303(c)(2)(B) requires States to adopt criteria for all section 307(a) toxic pollutants for which the Agency has published criteria under section 304(a) of the Act, if the discharge or presence of the pollutant could reasonably be expected to interfere with the designated uses of the water body. The section 307(a) list contains 65 compounds and families of compounds, which the Agency has interpreted to include 126 "priority" toxic pollutants for regulatory purposes. If data indicate that it is reasonable to expect that

one or more of the section 307(a) toxic pollutants will interfere with the attainment of the designated use, or is actually interfering with the designated use, then the State must adopt a numeric limit for the specific pollutant. Section 303(c)(2)(B) also provides that where EPA-recommended numeric criteria are not available, States shall adopt criteria based on biological monitoring or assessment methods.

### **Antidegradation Policy and Implementation Methods**

Water quality standards include an antidegradation policy and methods through which the State implements the antidegradation policy. Section 131.12 sets out a three-tiered approach for the protection of water quality.

"Tier 1" (40 CFR 131.12(a)(1)) of antidegradation maintains and protects existing uses and the water quality necessary to protect these uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur, whether or not such uses are designated uses for the water body in question.

"Tier 2" (section 131.12(a)(2)) protects the water quality in waters whose quality is better than that necessary to protect "fishable/ swimmable" uses of the water body. 40 CFR 131.12(a)(2) requires that certain procedures be followed and certain showings be made (an "antidegradation review") before lowering water quality in high-quality waters. In no case may water quality on a Tier II water body be lowered to the level at which existing uses are impaired.

"Tier 3" (section 131.12 (a)(3)) protects outstanding national resource waters (ONRWs), which are provided the highest level of protection under the antidegradation policy. ONRWs generally include the highest quality waters of the United States. However, the ONRW antidegradation classification also offers special protection for waters of "exceptional ecological

significance," i.e., those water bodies which are important, unique, or sensitive ecologically, but whose water quality, as measured by the traditional parameters such as dissolved oxygen or pH, may not be particularly high. Waters of exceptional ecological significance also include waters whose characteristics cannot adequately be described by traditional parameters (such as wetlands and estuaries).

Antidegradation implementation procedures address how States will ensure that the permits and control programs meet water quality standards and antidegradation policy requirements.

### **General Policies**

The Water Quality Standards Regulation allows States to include in their standards State policies and provisions regarding water quality standards implementation, such as mixing zones, variances, and low-flow exemptions subject to EPA review and approval. These policies and provisions should be specified in the State's water quality standards document. The State's rationale and supporting documentation should be submitted to EPA for review during the water quality standards review and approval process.

### **Mixing Zones**

States may, at their discretion, allow mixing zones for dischargers. The States' water quality standards should describe the methodology for determining the location, size, shape, outfall design, and in-zone quality of mixing zones. Careful consideration must be given to the



appropriateness of a mixing zone where a substance discharged is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic.

### ***Low-Flow Provisions***

State water quality standards should protect water quality for the designated and existing uses in critical low-flow situations. States may, however, designate a critical low-flow below which numerical water quality criteria do not apply. When reviewing standards, States should review their low-flow provisions for conformance with EPA guidance.

### ***Water Quality Standards Variances***

As an alternative to removing a designated use, a State may wish to include a variance as part of a water quality standard, rather than change the standard across the board, because the State believes that the standard ultimately can be attained. By maintaining the standard rather than changing it, the State will assure that further progress is made in improving water quality and attaining the standard. EPA has approved State-adopted variances in the past and will continue to do so if:

- the variance is included as part of the water quality standard;
- the variance is subjected to the same public review as other changes in water quality standards;
- the variance is granted based on a demonstration that meeting the standard is not feasible due to the presence of any of the same conditions as if the State were removing a designated use (these conditions are listed in section 131.10(g) of the Regulation); and
- existing uses will be fully protected.

## **Water Quality Standards Review and Revision Process - (Subpart C)**

The Clean Water Act requires States to hold a public hearing(s) to review their water quality standards at least once every 3 years and revise them if appropriate. After State water quality standards are officially adopted, a Governor or designee submits the standards to the appropriate EPA Regional Administrator for review. EPA reviews the State standards to determine whether the analyses performed are adequate. The Agency also evaluates whether the designated uses and criteria are compatible throughout the water body and whether the downstream water quality standards are protected. After reviewing the standards, EPA makes a determination whether the standards meet the requirements of the law and EPA's water quality standards regulations. If EPA disapproves a standard, the Agency indicates what changes must be made for the standard to be approved. If a State fails to make the required changes, EPA promulgates a Federal standard, setting forth a new or revised water quality standard applicable to the State.

### **State Review and Revision**

States identify additions or revisions necessary to existing standards based on their 305(b) reports, other available water quality monitoring data, previous water quality standards reviews, or requests from industry, environmental groups, or the public. Water quality standards reviews and revisions may take many forms, including additions to and modifications in uses, in criteria, in the antidegradation policy, in the antidegradation implementation procedures, or in other general policies.

Some States review parts of their water quality standards every year. Other States perform a comprehensive review every 3 years. Such reviews are necessary because new scientific and technical data may become available. Environmental changes over time may also necessitate the need for the review.

## EPA Review

When States adopt new or revised WQS, the State is required under CWA section 303(c) to submit such standards to EPA for review and approval/disapproval. EPA reviews and approves/disapproves the standards based on whether the standards meet the requirements of the CWA. As a result of the EPA review process, three actions are possible:

- EPA approval (in whole or in part) of the submitted State water quality standards; or
- EPA disapproval (in whole or in part) of the submitted State water quality standards; or
- EPA conditional approval (in whole or in part) of the submitted State water quality standards.

Revisions to State water quality standards that meet the requirements of the Act and the WQS Regulation are approved by the appropriate EPA Regional Administrator. If only a partial approval is made, the Region, in notifying the State, identifies the portions which should be revised (e.g., segment-specific requirements).

If the Regional Administrator determines that the revisions submitted are not consistent with or do not meet the requirements of the Act or the WQS Regulation, the Regional Administrator disapproves the standards within 90 days with a written notification to the State. The letter notifies the State that the Administrator will initiate promulgation proceedings if the State fails to adopt and submit the necessary revisions within 90 days after notification. The State water quality standard remains in effect, even though disapproved by EPA, until the State revises it or EPA promulgates a rule that supersedes the State water quality standard.

## Federally Promulgated Water Quality Standards - (Subpart D)

As discussed above, EPA may promulgate Federal Water Quality Standards. Section 303 of the Clean Water Act permits the Administrator to promulgate Federal standards:

- if a revised or new water quality standards submitted by the State is determined by the Administrator not to be consistent with the applicable requirements of the Act; or
- in any case where the Administrator determines that a new or revised standard is necessary to meet the requirements of the Act.

Federal promulgations are codified under Subpart D of the Regulation.

## THE ROLE OF WQS IN THE WATER QUALITY MANAGEMENT PROGRAM

State water quality standards play a central role in a State's water quality management program, which identifies the overall mechanism States use to integrate the various Clean Water Act quality control requirements into a coherent management framework. This framework includes, for example:

- setting and revising standards for water bodies;
- Water Quality Assessments to determine attainment of designated uses;
- CWA section 305(b) water quality monitoring to provide information upon which water quality-based decisions will be made, progress evaluated, and success measured;
- calculating total maximum daily loads (TMDLs), waste load allocations (WLAs) for point sources of pollution, and load allocations (LAs) for nonpoint sources of pollution;
- developing a water quality management plan, certified by the Governor and approved by EPA, which lists the standards and prescribes the regulatory and construction activities necessary to meet the standards;
- preparing section 305(b) reports and lists that document the condition of the State's water quality;
- developing, revising, and implementing an effective CWA section 319 program and CZARA section 6217 program to control NPS pollution;

- making decisions involving CWA section 401 certification of Federal permits or licenses; and
- issuing NPDES permits for all point source discharges. Permits are written to meet applicable water quality standards.

The Act provides the basis for two different kinds of pollution control programs. Water quality standards are the basis of the water quality-based control program. The Act also provides for technology-based limits known as best available treatment technology economically achievable for industry and secondary treatment for publicly owned treatment works. In some cases, application of these technologically based controls will result in attaining water quality standards. Where such is not the case, the Act requires the development of more stringent limitations to meet the water quality standards.

Regulations, policy, and guidance have been issued on all the activities mentioned in this section. Chapter 7 contains a brief discussion of how water quality standards relate to many of these activities in the water quality-based approach to pollution control, but additional details on these other programs is beyond the scope of this Handbook. For further information, see the EPA guidance documents referenced in chapter 7.

## FUTURE PROGRAM DIRECTIONS

Since the 1960's, the water science program has moved from solving a limited set of problems in a limited set of waters to one that is solving a broad range of complex problems in categories of U.S. waters and addressing cross-media aspects of water quality decisions. Initial efforts focused on the more visible sources of pollution such as organic loadings, solids, oil, and grease, and then shifted to toxics and more complex mixtures of pollutants.

Developments in two areas have significantly affected the scientific underpinnings of the water program. First is the science of risk assessment used to estimate risk to human health and the environment from exposure to contaminants. Second is our ability to measure pollutants in the environment at an increasing level of precision. The evolution of methods and capabilities within these two scientific disciplines has significantly advanced the sophistication of scientific analyses used to manage the water program.

As the water science program moves toward the 21st Century, we must provide technical information and tools that allow States, the regulated community, and the public to understand and apply the methods, criteria, and standards to environmental systems. This includes updating science and adapting technologies as appropriate to keep the foundation of our program solid as well as employing or modifying these approaches when appropriate for new problems.

The CWA provides broad authority through its goals and policy, such as:

. . . to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (section 101(a)); and

. . . wherever attainable . . . water quality which provides for the

protection and propagation of fish, shellfish, and wildlife . . . to protect the water of the United States (section 101(a)(2)).

The breadth of this authority is also reflected in specific EPA mandates such as those in section 304(a):

[EPA] shall develop and publish . . . criteria for water accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare . . . (B) on the concentration and dispersion of pollutants . . . through biological, physical, and chemical processes; and (C) the effects of pollutants on biological community diversity, productivity, stability . . . including eutrophication and rates of . . . sedimentation . . . (CWA section 304(a)(1)); and

[EPA] shall develop and publish . . . information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity . . . (B) on the factors necessary for the protection and propagation of shellfish, fish, and wildlife . . . and to allow recreational activities in and on the water . . ." (304(a)(2))(CWA section 304(a)(2))

EPA has traditionally focused on criteria for chemical pollutants, but has also developed criteria for a limited number of physical (e.g., color, turbidity, dissolved solids) and biological (bacteria, "free from" nuisance aquatic life) parameters (NAS/NAE, 1973; USEPA, 1976). However, as EPA's water quality protection program has evolved, it has become apparent that chemical criteria alone, without the criteria for the biological and physical/habitat components of

water bodies, are insufficient to fully achieve the goals of the CWA.

Future directions in the criteria and standards program will focus on providing scientific and technical tools to aid regional, State, and local environmental managers in (1) implementing the standards program, and (2) developing new science and technology that will reduce human and ecological risks resulting from exposure to unaddressed contaminants and prevent pollution from point and nonpoint sources.

Setting future national program priorities will be based on the consideration of risk assessment; statutory and court-mandated obligations; the expressed needs of regional, State, and local environmental managers and the regulated community; and the potential effectiveness of a program to influence real environmental improvement.

EPA will be developing methodologies and criteria in areas beyond the traditional chemical-specific type criteria of the past. Areas of scientific examination and potential regulatory controls include criteria to protect wildlife, wetlands, and sediment quality; biological criteria to better define desired biological communities in aquatic ecosystems; and nutrient criteria. EPA has also moved in the direction of the physical and habitat components of water quality protection in other water quality programs. For example, the CWA section 404(b)(1) Guidelines (40 CFR 230) evaluate physical characteristics (such as suspended particulates, flow, and hydroperiod), and habitat components (such as food web organisms, breeding/nesting areas, and cover). Implementation of these various types of criteria will be influenced by the environmental concerns in specific watersheds.

To protect human health, program emphasis will shift to focus on the human health impacts of pathogenic microorganisms in ambient waters that cause illness in humans, and will address concerns about the risk that contaminated fish may pose to

sensitive populations whose daily diet includes large quantities of fish.

In an expanded effort to protect ecology, there will be increasing emphasis on the watershed approach by assessing all potential and actual threats to a watershed's integrity. Risk assessment of the watershed and setting priorities based on those risks will become increasingly important in future program efforts in criteria and standards as supporting elements to the watershed approach.

Over the next few years, there will be more emphasis on developing effective risk reduction strategies that include both traditional and non-traditional controls and approaches.

Future program directions in criteria development and then adoption and implementation of water quality standards will be based on the principle of ecological and human health risk reduction through sound and implementable science.

### **Endangered Species Act**

An important consideration in future criteria and standards development will be the conduct of the consultation provisions of the Endangered Species Act (ESA) and the implementation of any revisions to standards resulting from those consultations. Section 7 of the Endangered Species Act requires all Federal agencies, in consultation with the Fish and Wildlife Service and the National Marine Fisheries Service (the Services) to assure that any action authorized, funded, or implemented by a Federal agency does not jeopardize the existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitat. The definition of a Federal action is very broad and encompasses virtually every water program administered by EPA.

The responsibility for ensuring that consultation occurs with the Services lies with EPA, although in fulfilling the requirements a non-Federal representative may be designated for informal

consultation. (Note: Consultation may be formal or informal; the latter form is the most prevalent.) Protection of threatened and endangered species and their habitat is a critical national priority, and the criteria and standards programs can be effective tools to meet this national priority. All aspects of standards, including aquatic life criteria, uses, antidegradation, and implementation actions related to the standards are subject to consultation. All future revised aquatic life criteria, sediment, wildlife, and biological criteria will be subject to the consultation requirements as will their adoption into enforceable standards.

To form an effective partnership between the Services and EPA in creating a framework for meeting the responsibilities under section 7 of the Endangered Species Act and applicable EPA regulations, the Services and EPA entered into a joint guidance agreement in July 1992 (see Appendix F). This agreement sets forth the procedures to be followed by the Services and EPA to assure compliance with section 7 of the ESA in the development of water quality criteria published pursuant to section 304(a) of the CWA and the adoption of water quality standards under section 303(c). This agreement also indicated that the regional and field offices of EPA and the Services could establish sub-agreements specifying how they would implement the joint national guidance.

During the preparation of this second edition Handbook, the Services and EPA initiated a work

group to develop a more extensive joint agreement. This group was charged with the responsibility of reviewing the July 1992 agreement, making appropriate revisions to the water quality criteria and standards sections, and adding a new section discussing the consultation procedures to be followed for the NPDES permit program. When the revised agreement is approved by the Agencies, it will replace the agreement included in this Handbook as Appendix F.

Both the current agreement and the proposed revision seek to ensure a nationally consistent consultation process that allows flexibility to deal with site-specific issues and to streamline the process to minimize the regulatory burden. The overriding goal is to provide for the protection and support of the recovery of threatened and endangered species and the ecosystems on which they depend.

