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EPA

Introduction to Water Quality Standards

OVERVIEW

In response to widespread public concern about the condition of our Nation's waters the United States Congress enacted landmark legislation in 1972. This statute, the Federal Water Pollution Control Act Amendments of 1972 [referred to as the Clean Water Act of 1972 (CWA)] expanded and built upon existing laws designed to control and prevent water Pollution. Successive amendments to the 1972 CWA (the ***Clean Water Act*** *of* 1977 and the Water Quality Act *of* 1987) have continued to strengthen the law to better protect our Nation's waters.

Water quality standards are the cornerstone of a ***State's*** water quality management program. States and ***Indian Tribes*** set water quality standards for waters within their jurisdictions. Water quality, standards define a use for a waterbody and describe the specific ***water quality criteria*** to achieve that use. The water quality standards also contain ***antidegradation policies*** to protect existing water quality. These are the goals by which success is ultimately gauged for a given waterbody or ***watershed***.

This publication provides general information about the water quality standards program. It is intended to serve as an introductory document for the general public and for those unfamiliar with the water quality standards program. This document also informs the reader about where to obtain additional information about water quality standards. The document also contains a Glossary of terms used in this publication as Appendix A. It also contains terms and concepts commonly associated with water quality standards. Terms found in the Glossary, are printed in ***boldface italic type*** at their first use, as above.

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Section 1: Introduction

Part A: ***Definition and Purpose of Water Quality Standards***

Water quality standards are laws or regulations that States and Indian Tribes authorized to administer the program adopt to enhance water quality and to protect public health and welfare. Water quality standards provide the foundation for accomplishing two of the principal goals of the Federal Water Pollution Control Act Amendments of 1972 [commonly referred to as the Clean Water Act (CWA) of 1971-1. That is to:

- restore and maintain the chemical, physical, and ***biological integrity*** of the Nation's waters; and

- where ***attainable,*** to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water. This goal is commonly known by the expression "fishable/swimmable".

States report to the U.S. Environmental Agency (EPA) and Congress under a specific part of the CWA, known as Section 305(b), on whether these goals are being achieved. (Under Section

305(b), States report to EPA once every two years on the condition of their waters. EPA compiles the data and submits a report to Congress on the status and condition of the Nation's waters.)

A water quality standard consists of three elements: (1) the ***designated beneficial use*** or uses of a waterbody or segment of a waterbody: (2) the water quality criteria necessary to protect the use or uses of that particular waterbody; and (3) an antidegradation policy. (Each of these elements is discussed in this publication.) Examples of designated uses are recreation and protection of aquatic life. Water quality criteria describe the quality of water that will support a designated use. Water quality criteria may be expressed as either numeric limits or a narrative statement. An

antidegradation policy ensures that water quality improvements are conserved, maintained, and protected.

Water quality standards apply to ***surface waters of the United States,*** including ***wetlands***. Surface waters include rivers, streams, lakes, oceans, **estauries, and** wetlands; they do not include ground water.

Part B: Statutory Authority for the Water Quality Standards Program

The water quality standards program is authorized under Section 303(c) of the CWA (33 U.S.C. 1313(c)). The current regulations implementing this section of the CWA were published initially in the ***Federal Register*** (FR) on November 8, 1983 (48 FR 51400). The specific language of the regulations can be found in the ***Code of Federal Regulations*** (CFR) in Chapter 40, Part 131.

(The Federal Register is a periodical published by the U.S. Government. It includes all proposed and final regulations issued by EPA and other federal agencies. The number preceding the letters "FR" in the citation refers to the volume of the Federal Register, and the numbers after FR indicate the page number. The Code of Federal Regulations contains all EPA and other regulations that have received final approval. This document is abbreviated as CFR. The numbers in CFR citations refer to chapters and parts: each chapter customarily includes all the regulations in a given policy area such as water quality standards, while each part within a chapter is a specific subject within that policy area.)

The water quality standards program was strengthened in two significant ways with passage of the 1987 Water Quality Act amendments to the CWA. First, Section 303(c)(2)(B) of the CWA requires States to adopt numeric criteria for specific toxic pollutants that appear on a ***priority pollutant*** list [Section 307(a) of the CWA]. (Priority pollutants are compounds and families that are among the most persistent, prevalent, and toxic chemicals. A list of priority

pollutants appears as Appendix B.) These ***toxic substances*** are those for which EPA published Section 304(a) criteria recommendations. These toxics, if discharged to a waterbody or are present in sufficient concentrations in a waterbody, could compromise or interfere with the waterbody's designated use. On December 22, 1992, EPA imposed Federal chemical-specific, numeric criteria for priority toxic pollutants on 14 States that failed to adopt their own criteria, as required by Section 303(c)(2)(B) of the CWA. This action brought all States into compliance.

Second, Section 518 of the 1987 CWA gives EPA the authority to approve Indian Tribes to administer the water quality standards program on Reservation Lands. Section 518 also required EPA to develop a mechanism for resolving disputes when an Indian Tribe and a State adopt different water quality standards on a common body of water. On December 12, 1991, EPA issued Amendments to the Water Quality Standards Regulation that Pertain to Standards on ***Indian Reservations*** (40 CFR 131.6 and 131.7). The Amendments establish qualification criteria for Indian Tribe administration and describe a conflict resolution mechanism.

Part C: Establishing Water Quality Standards

The 50 States, the District of Columbia, U.S. Territories (Commonwealth of Puerto Rico, American Samoa, Palau, the Virgin Islands, Guam, and the Commonwealth of the Northern Mariana Islands), and Indian Tribes authorized to administer the program adopt water quality standards for each waterbody within the *State*, territory, or tribal boundary. (Throughout this document, the term State is used to mean any of the above jurisdictions.) EPA may also establish water quality standards where a State fails to do so. A single water quality standard need not be applied to the entire waterbody (for example, for the entire length of a stream); different water quality standards may be set on different segments of the same waterbody.

EPA reviews new or revised water quality standards that States adopt to determine whether the standards meet CWA requirements. EPA also reviews the standards of each State to ensure that they do not interfere with attainment of standards in waters shared with another State or waters located in another State downstream. If EPA disapproves a State's water quality standards, or determines that a new or revised water quality standard is necessary to meet the requirements of the Act, EPA may issue water quality standards to which the State is bound. EPA provides technical guidance, program grants, and assistance to the States to help them carry out the requirements of the program.

Section II: Uses of a Waterbody

Part A: Designated Uses and Existing Uses

The water quality standards program categorizes water uses in two ways: designated uses and ***existing uses***. A designated use is the legally applicable use specified in a water quality standard for a watershed, waterbody, or segment of a waterbody. A designated use is a use that, presently, may or may not be met or ***"attained"***. All pollution control activities are designed to attain the designated uses. An existing use is the use that has been achieved for a waterbody on or after November 28, 1975, and that requires the most stringent criteria. (This is the date when the original water quality standards regulation took effect.)

Understanding the distinction between existing and designated uses is fundamental to understanding the standards program. An existing use for a specific waterbody is one that has been attained; that use and the water quality necessary to continue supporting that use must be protected and maintained. Designated uses, on the other hand, may be changed upon finding that the use cannot be attained, but only after conducting a ***Use Attainability Analysis*** (UAA), described in Part C of this Section. Changing a designated use also results in a change to the applicable water quality criteria.

Part B: Typical Uses of a Waterbody

Typical uses of waterbodies include public water supply, propagation of fish and wildlife, recreation, agriculture, industrial processes, and navigation. EPA does not recognize waste transport as an acceptable use. Designated or existing uses for wetlands may include providing habitat for endangered species or mitigating the effects of floodwaters.

A special designated use category is ***Outstanding National Resource* Waters** (ONRWs). These waters are high quality or ***ecologically*** unique waters such as those within the jurisdiction of National and

State Parks and wildlife refuges. **ONRWs** are waters that are ecologically important, unique, or sensitive (such as swamps or hot springs), which the commonly applied use classifications and supporting criteria do not always serve to protect. No new or additional discharges can occur in **ONRWs**. Some States have a special use category called State Resource Waters, which may allow limited changes in water quality as long as the changes do not affect the characteristics that support the use designation.

Part C: Establishing Designated Uses

States are responsible for establishing designated uses of a waterbody. Categories of designated uses vary by State. Each State develops its own use classification system based on the generic uses cited in the CWA (see Section 1, Part A). States may designate uses such as cold water fisheries or particular species to be protected, for example, trout or bass. States may also designate special uses to protect sensitive or valuable aquatic life or ***habitat***.

Figure I below illustrates an example of a use designation. In this case, the waterbody depicted is a cold water stream, and the

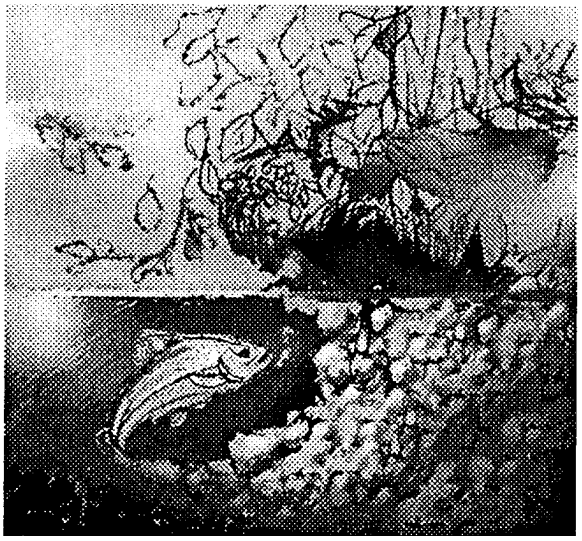

Figure 1

designated use is aquatic habitat. The stream system is appropriate for sustaining the brook trout depicted in the figure because it has undercut banks, a gravel stream bed, and overhanging vegetation.

Uses may be revised during periodic State reviews of the water quality standards, which, by law, are required at least once every three years. The public must have an opportunity to comment on changes in uses and EPA must approve any changes.

When establishing a designated use that does not meet the "fishable/ swimmable" goal, States perform a use attainability analysis (UAA) to determine the achievable uses of a waterbody. A UAA is a structured scientific assessment of the physical, chemical, biological, and economic factors that affect the attainment of a use. Consisting of a waterbody survey and assessment and an economic analysis, if appropriate, the UAA enables the States to answer the following questions about the conditions of its waters:

What is the existing use to be protected?

To what extent does pollution (as opposed to physical factors) contribute to impaired use?

What level of ***point source*** control is required to restore or enhance the use? (The term "point source" refers to pollution resulting from discharges into receiving waters from any discernible confined and discrete conveyance such as a pipe, ditch, or sewer.)

What level of ***nonpoint source*** control is required to restore or enhance the use? (The term "nonpoint source" refers to pollution sources that are diffuse and do not have a single point of origin. Run-off from agriculture, forestry, and construction sites are examples.)

While UAAs are the responsibility of the States, the actual studies

may be performed by other entities (e.g., consultants hired by the States or Indian Tribes). States are encouraged to consult with EPA before the analysis is initiated and frequently while it is being conducted. EPA's Regional Offices can provide additional information about UAAs (Section VII of this document contains a list of the Regional Offices and the States and Territories covered by each region). A State may also elect, at its option, to conduct a UAA even when designating fishable/swimmable uses, simply to document the reasonableness of the designation and the attainability.

Part D: Changing Designated Uses

States may modify a designated use when its attainment is precluded because of one or more of the following factors:

- naturally occurring pollutant concentrations;
- natural, intermittent or low-flow water levels;
- ***anthropogenic*** conditions or sources of pollution that cannot be corrected or for which corrective measures would cause more deterioration of the environment than would leaving the conditions or pollutants in place;
- *dams, diversions, or other* ***hydrologic*** modifications;
- physical conditions associated with the natural features of the waterbody, unrelated to quality, that impede protection of aquatic life; or
- more stringent controls than those required by Sections 301(b)(1)(A) and (B) and 306 of the CWA would result in substantial and widespread economic and social impact.

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Section III: Water Quality Criteria

Part A: Definition of Water Quality Criteria

The phrase "water quality criteria" has two definitions under the CWA. First, under Section 304(a), EPA publishes water quality criteria that reflect available scientific information on the concentrations of specific chemicals in water that protect aquatic life or human health. These criteria are intended to provide protection for all surface waters on a national basis and may be used by the States as a basis for developing enforceable water quality criteria as part of their standards. The general public sometimes mistakenly views these criteria as the "standards." In a legal sense, a water quality standard must also contain a designated use and an antidegradation policy.

Second, water quality criteria are elements of water quality standards adopted by a State under Section 303(c), which describe the quality of water that will support a particular use. When properly selected criteria are met, they are expected to protect the designated use. As a practical matter, most States for most pollutants adopt EPA's Section 304(a) criteria recommendations as part of their legally enforceable water quality standards.

Part B: Forms of Criteria

Water quality criteria are expressed in either numeric form or narrative form. Numeric criteria are expressed as chemical concentrations or conditions (such as pH or turbidity) in water which should protect designated uses. Concentrations of chemicals or other pollutants are typically expressed as a weight, measured per liter, such as ug/L (micrograms per liter) or mg/L (milligrams per liter). Micrograms are much smaller than milligrams: one milligram equals 1000 micrograms. An example of a numeric criterion is *dissolved oxygen* >/= *5.0 mg1L* (stated in English, this narrative criterion means that the amount of oxygen dissolved in the water should be equal to or greater than 5 milligrams per liter).

Section 303(c)(2)(B) of the CWA requires States to adopt numeric criteria for priority toxic pollutants. The 126 individual priority toxics are listed in Appendix B to this document.

Narrative criteria are expressed in concise statements, generally in a "free from" format. EPA aesthetic narrative quality criteria, for example, state that "all waters should be free from substances attributable to wastewater or other discharges that: (1) settle to form objectional deposits; (2) float as debris, scum, oil, or other matter to form nuisances; (3) produce objectionable color, odor, taste, or turbidity; (4) injure, are toxic to, or produce adverse physiological responses in humans, animals, or plants; and (5) produce undesirable or nuisance aquatic life." Similarly, the phrase "free from toxic pollutants in toxic amounts" is derived from the national goal statement in Section 101(a)(3) of the CWA. An example of a narrative, biological criterion is natural ***background conditions*** shall be maintained.

Part C: Site-specific Criteria

Site-specific criteria are either numeric or narrative criteria adopted for a particular site that reflect environmental conditions at that site. The EPA Section 304(a) guidance on water quality criteria, which are intended to provide protection for all surface waters on a national basis, is broad. These broad criteria can be tailored to reflect localized, site-specific conditions. Site-specific criteria are sometimes justified because:

- species inhabiting a given site may be more sensitive or less sensitive than those used by EPA to develop Section 304(a) criteria;

- water chemistry (e.g., pH, hardness, temperature, suspended solids) at the site may differ substantially from the water used in the laboratory for developing Section 304(a) criteria, affecting toxicity of the chemicals to the organisms in the water; or

EPA may not have a criteria recommendation for a pollutant adversely affecting the designated use at a particular location.

Part D: Developing Water Quality Criteria

EPA publishes, as guidance, Section 304(a) criteria which reflect the most current scientific information available regarding pollutant effects on human health and aquatic life. The criteria, which have no force of law, are published as guidance documents to assist the States and Indian Tribes in setting water quality standards. ***Human health criteria*** provide guidelines that specify the potential risk of adverse effects to humans due to substances in water. ***Aquatic life criteria*** are designed to protect all aquatic life, including plants and animals.

The criteria guidance documents issued by EPA contain two major types of information:

1. scientific data on the effects of pollutants on human health (including recreation) and aquatic life; and

2. quantitative concentrations or qualitative assessments of pollutants in water that will generally ensure water quality adequate to support a particular use.

The document, *Quality Criteria for Water 1986*, contains summaries of all contaminants and conditions for which EPA has developed criteria recommendations. The current edition is known as the "Gold Book." This document may be obtained for a fee from the National Technical Information Source (NTIS) or the Education Resource Information Center (ERIC) (complete ordering information is contained in Section VII of this document).

EPA considers effective State water quality standards programs to include both numeric approaches and narrative approaches. In the case of toxic pollutants, for example, numeric criteria for specific

chemicals are appropriate in circumstances where the cause of toxicity is known, or when human health effects are associated with a specific concentration of the toxic pollutant. A narrative standard may be suitable when a specific pollutant is identified as impairing the quality of the waterbody (such as reducing fish populations), but a numeric criterion is not specified in State standards. Narrative standards can also be used when the chemical(s) causing the toxicity is unknown. As a specific standards program matures and more definitive data become available, narrative criteria can be replaced with numeric ones.

Anyone may propose a site-specific criterion to a State. A municipality or a private company may conduct the work to support a site-specific criterion. The State must review the data and the procedures used to collect and analyze the data. The State must then make the determination whether to adopt site-specific criteria. If adopted, the State must submit the site-specific criteria to EPA for review and approval or disapproval. The State may use methods that are less scientifically rigorous than EPA's, but the methods must be defensible (as required by 40 CFR 13 1.11).

Guidance, developed by EPA, for deriving site-specific water quality criteria starting with EPA's Section 304(a) criteria can be obtained form EPA's Health and Ecological Criteria Division at the address listed in Section VII. *Guidelines for Deriving Numerical National Water Quality Criteria for the Proctection of Aquatic Life*, published in October 1984, is available from NTIS (publication number PB85-227049). States are also urged to consult with the appropriate EPA Regional Office (listed in Section VII) before beginning to develop site-specific criteria.

Part E: Water Quality Criteria for Protection of Human Health

Water quality criteria have been established to protect human health from most toxic pollutants ingested by consuming aquatic organisms (such as fish containing mercury). The criteria are based on the assumption that humans consume 6.5 grams of contaminated aquatic

organisms daily and that the average body weight of a human is 70 kg or about 150 pounds. These criteria use other standardized factors for each pollutant, which are derived from laboratory studies. EPA is now revising its human health criteria, which will encourage more State and local input on risk management decisions.

EPA's water quality criteria for fish consumption are distinct from the limits developed by the ***Food and Drug Administration*** (FDA) and serve a different function. The EPA criteria for protecting human health are non-regulatory, scientific recommendations for ambient levels in water, which if not exceeded, will ensure that safe levels are maintained in edible aquatic organisms. ***("Ambient"*** refers to the existing conditions in the waterbody.) The FDA action levels are regulatory numbers used to prohibit the sale of edible aquatic life when contaminant concentrations in the edible portions of the organisms exceed the FDA limit.

Part F. Water Quality Criteria for the Protection of Aquatic Life

The development of national numerical water quality criteria for the protection of aquatic life is a complex process. After a decision is made that a national criterion is needed for a particular material, all available information concerning the impact of that material on aquatic life is collected; this can include experimental and laboratory testing data. There are two types of criteria which may be established: "**acute**," which cover short-term exposures such as spills, and "**chronic**," which cover long-term or permanent exposures. One or both of the acute and chronic criteria may be related to other water quality characteristics, such as pH, temperature, or hardness. Separate criteria are developed for fresh and salt waters.

Part G: Other Criteria-Preserving Biological Integrity

In addition to human health and aquatic life criteria, EPA is developing ***biological*** and ***sediment criteria*** to further the CWA

goal of protecting the chemical, physical, and biological integrity of the Nation's waters. Biological criteria are narrative or numeric expressions that describe the desired biological condition of aquatic communities inhabiting particular types of waterbodies. Sediment criteria address the toxicity of different sediment types in different environmental settings; controlling sediment pollutant concentration helps prevent harmful chemicals from accumulating in the tissues of animals in the food chain.

While each type of water quality criterion has a different protective focus, human health, aquatic life, biological, and sediment criteria are complementary. No single criterion value or number will guarantee protection of all forms of life. Collectively, these four types of criteria provide a valuable tool for protecting the physical, chemical, and biological--and ultimately the ecological--integrity of the Nation's waters.

Figure 2 below shows how use designation and criteria can be applied to different waterbodies (in this case a stream, lake, and wetland) within a watershed.

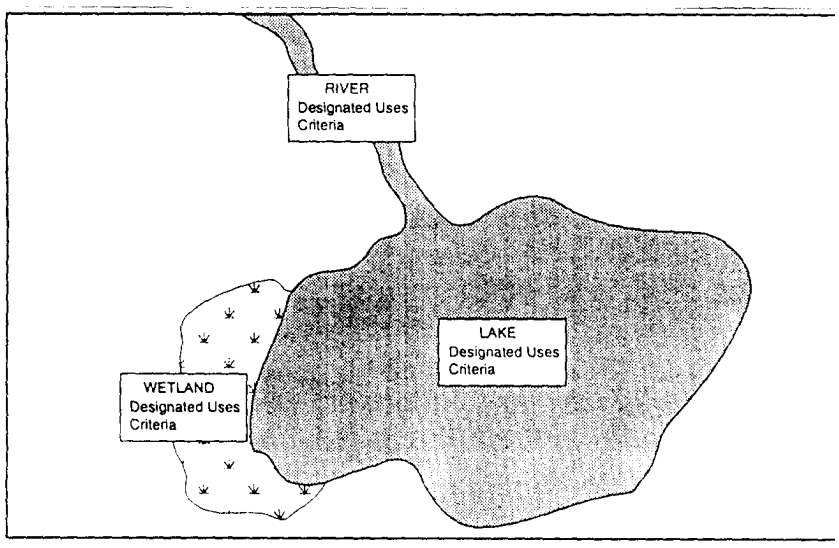


Figure 2

Section IV: Antidegradation Policy

Part A: Origin and Purpose of Antidegradation Policies

EPA's water quality standards regulation requires States and Indian Tribes to adopt a policy that conserves, maintains, and protects existing uses and the water quality necessary to protect these uses. This policy is known as the antidegradation policy. Established by the Secretary of Interior in February 1968 before the creation of EPA, the policy was incorporated into the water quality standards regulation issued by EPA in November 1975. The policy was clarified and included in the water quality standards regulation published in the Federal Register on November 8, 1983 (48 FR 51400); the specific code is contained in 40 CFR 131.12. Section 303(d) of CWA establishes Congressional recognition and approval of EPA's antidegradation policy.

Part B: Federal Antidegradation Requirements

The water quality standards regulation requires States and Indian Tribes to adopt an antidegradation policy that

- maintains existing uses of a waterbody or segment and the level of quality necessary to protect the use (known as Tier 1 waters);
- protects high quality waters (unless certain conditions are met). High quality water is that which exceeds levels necessary to support propagation of fish, shellfish, and wildlife as well as recreation in and on the water (these waters are also known as Tier 2 waters); and
- provides special protection for Outstanding National Resource Waters (ONRWs)(also known as Tier 3 waters).

Many States designate Outstanding State Waters instead of ONRWs to provide additional protection while allowing for limited discharges.

Part C: State Antidegradation Policies

States and Indian Tribes are required to adopt an antidegradation policy and methods for their implementation. The policy need not be formally adopted into the State's water quality standards, but it must be specifically referenced in the standards regulation so that its relationship to the standards is clear.

EPA has the authority to review State and Tribal antidegradation policies and to issue such policies if a State or Indian Tribe fails to adopt an antidegradation policy that is consistent with the CWA. Implementation plans may be disapproved by EPA if the plans contain provisions that may result in violating the intent, spirit, and requirements of the antidegradation policy.

Issuance of a ***National Pollution Discharge Elimination System*** (NPDES) ***permit*** by the State or Indian Tribe serves as an example of how EPA may disapprove the implementation of an antidegradation policy. (Section 402 of the CWA, the National Pollutant Discharge Elimination System, is the EPA program that controls the ***discharge*** of pollution from point sources by requiring that a person or organization discharging any type of waste into a surface water obtain a NPDES permit from the EPA, and limit their discharges to the limit contained within the permit. EPA has the legal authority to delegate its permit granting role to the States and Indian tribes.) If a State or Indian Tribe, for example, fails to apply its antidegradation policy when it issues an NPDES permit, EPA may object to the permit as not meeting the requirements of the Act. The State or Tribe may then be barred from issuing the permit until steps are taken to comply with the antidegradation policy. Citizens may also challenge any permit in State court on the grounds that it does not comply with the State's or Indian Tribes's antidegradation policy. Additionally, EPA may determine

that the State's or Indian Tribe's antidegradation policy is, in fact, inconsistent with EPA requirements (40 CFR Section 131.12). In this case, EPA would issue an antidegradation policy for waters in the State or Reservation Lands.

The antidegradation policy has been developed so that it minimizes adverse effects on economic growth and development and at the same time protects CWA goals. Federal regulations are not intended to result in standards that are so stringent that compliance would cause severe economic impacts. The antidegradation policy does not prohibit lowering of water quality. It does, however, establish a public process for considering the relevant factors before doing so.

Part D: Antidegradation Policy and Wetlands

States and Indian Tribes are expected to fully apply their antidegradation policies to wetlands. Wetlands are defined in the CWA as those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include marshes, swamps, bogs, and similar areas.

The antidegradation policies should provide for the protection of existing uses in wetlands and the level of water quality that is necessary to protect those uses, similar to antidegradation policies in other waters. In the case of using wetlands for disposing ***dredge*** and ***fill*** material (such as materials that might result from development of highways and airports, or from construction of dams and levees), EPA follows a slightly different interpretation of existing uses. EPA recognizes that Congress intended for some fill to occur in wetlands, as long as the discharged materials do not result in significant degradation as defined in the section of the CWA that concerns permits for dredge and fill materials [Section 404(b)(1) guidelines in **40 CFR Part** 230)]. These guidelines establish a process to ensure that impacts to wetlands are avoided,

minimized, and mitigated. States may, of course, adopt stricter requirements for wetland fills in their antidegradation policies,

Section V: Water Quality Standards on Indian Lands

Part A: Requirements for Water Quality Standards Programs on Indian Lands

Before an Indian Tribe is granted authority to administer a water quality standards program, the following criteria must be met:

- The Indian Tribe must be recognized by the Secretary of Interior.
- The Tribe must have a governing body with substantial duties and powers within a defined area (including authority to conduct governmental functions such as ensuring the health and welfare of an affected population.).
- The water quality standards program must include managing and protecting water resources within the borders of the Indian Reservation.
- The Indian Tribe must have the necessary management and technical skills to implement an effective water quality standards program or must submit a plan to acquire those skills.

The Tribal application to administer the program must be submitted to the EPA ***Regional Administrator,*** who informs all neighboring governmental entities that the application has been received. The Regional Administrator allows 30 days for comments on the Tribe's application. (Locations of EPA Regional Offices and the States covered by each are contained in Section VII.) States and other Federal entities participating in the review cannot veto the application. EPA independently evaluates the application and promptly notifies the Tribe in writing whether it qualifies to administer the program. No statutory requirement exists that requires an Indian Tribe to apply for the water quality standards

program, nor is there a deadline by which applications must be submitted.

Part B: The Issue Dispute Resolution Mechanism

The December 12, 1991 Amendments to the Water Quality Standards Regulation That Pertain to Standards on Indian Reservations (40 CFR 131.6 and 131.7) set forth procedures to resolve unreasonable consequences that may arise when an Indian Tribe and State adopt different water quality standards on a common body of water. EPA has established mechanisms for resolving disputes between Indian Tribes and States, but prefers that Indian Tribes and States resolve disputes without EPA involvement.

The ***"issue dispute resolution mechanism"*** is a way for EPA to resolve issues that arise as a result of States and Indian Tribes setting different water quality standards on common bodies of water. Dispute resolution actions involving water quality standards must be consistent with one or more of the following options:

a. ***Mediation.*** The EPA Regional Administrator may appoint a mediator who can be an employee of EPA or some other Federal agency, or another appropriately qualified individual. The mediator, acting as a neutral facilitator, encourages communication and negotiation among disputing parties, and may establish advisory panels to study the problems and recommend a solution. The advisory panel must consist of members from the affected parties. The mediation procedure and schedule is determined by the mediator in consultation with the parties to the dispute.

b. ***Arbitration.*** The EPA Regional Administrator may appoint an arbitrator or arbitration panel (which disputing parties must approve) to settle the dispute. Arbitrators and panel members may be EPA employees, employees of other Federal agencies, or other individuals with appropriate qualifications. Individuals serving in this capacity who are Federal employees must act

independently of their agencies. Arbitrators and panelists must be versed in the water quality standards program and understand the political and economic interests of the Indian Tribes and States involved.

At least one private or public meeting must be held with the parties. The arbitrator or panel must solicit information on how fulfilling the requirements for obtaining a permit affect entities that discharge into a water body, comparative risks to public health and the environment, economic impacts, water uses, water quality, and other factors relevant to the dispute. After considering these factors, the arbitrator or panel provides a written recommendation for resolving the dispute to the affected parties and the EPA Regional Administrator.

Disputing parties need not accept the recommendation unless they voluntarily entered into a binding agreement to do so. If a party to the dispute believes that the arbitrator or panel has recommended an action that is inconsistent with the CWA, the party may appeal the recommendation to the Regional Administrator in writing. The appeal must include the statutory basis for altering the arbitrator's recommendation.

c. *Dispute Resolution Default Procedure.* A default procedure is available when disputing parties refuse to participate in either mediation or arbitration. In such an event, the EPA Regional Administrator may appoint a single official or panel to review information related to the dispute and issue a written recommendation for its resolution. Recommendations issued by EPA resulting from this default procedure have no force of law.

Part C: Options for Establishing Water Quality Standards

Indian Tribes have three options for establishing water quality standards for waters under their jurisdiction:

They may negotiate a cooperative agreement with an adjoining State to apply that State's water quality standards to the Reservation Lands. A cooperative agreement can include any provision agreed upon by the two parties; or

they may adopt the adjacent State's water quality standards with or without modifications; or

they may develop and adopt their own standards to account for unique Tribal uses and needs.

Section VI: Adoption of Water Quality Standards

Part A: Processes For Establishing Water Quality Standards

The process for developing, reviewing, adopting, and implementing water quality standards on land under the jurisdiction of States and Indian Tribes is the same. The overall requirements are specified in the CWA and the water quality standards regulation issued on November 8, 1983.

Each State and Tribe has its own legal and administrative procedures for adopting water quality standards; there are no standardized procedures. The CWA requires States and Indian Tribes to hold one public hearing and to involve the public in reviewing and revising water quality standards.

The governmental entity responsible for adopting State or Indian Tribal water quality standards varies from State to State and Tribe to Tribe. In some States, water quality standards are adopted by the State legislative body and signed into law by the Governor. In others, standards are adopted through an administrative agency rulemaking procedure which may be subject to legislative oversight. For Indian Tribes, the governing Tribal body or authority is responsible for adopting water quality standards on Reservation Lands.

One approach to water quality protection considers the whole aquatic system, including other resource management programs that address land, air, and water to successfully manage problems for a given aquatic resource. This approach--the watershed protection approach--encourages States and Indian Tribes to work collectively to manage high priority water quality concerns, to coordinate among various interests, and to devise solutions for local conditions. States and Tribes define the goals in the watershed, or waterbody, of concern and can adopt these in their water quality standards. Goal selection is driven by stakeholder involvement in the process.

Part B: Status of the Water Quality Standards Program

All 50 States, the District of Columbia, and the U.S. Territories have developed water quality standards. Some Indian Tribes have been authorized to administer the water quality standards program and have approved water quality standards. The number of Tribes that may eventually assume responsibility for the program is unknown.

Part C: Reviewing, Revising, and Adopting New Standards

Section 303(c) of the CWA requires States to hold public hearings at least once every three years to review applicable water quality standards and, if appropriate, to adopt new standards. In conjunction with EPA, States select waterbodies for which water quality standards are to be reviewed in-depth. Selection is based on the following sources of information:

a list of ***impaired waters,*** Section 304(l). This list comprises two types of waters: first, those in which water quality standards cannot be met because of the presence of toxic pollutants; second, those in which the following uses cannot be maintained or achieved. This category includes public water supplies, agricultural and industrial uses, the protection and propagation of a balanced population of shellfish, fish and wildlife, and recreational activities in and on the water. The second category also includes any waters that present a threat to public health.

reports on the condition of the waters within the boundaries of each State (Section 305(b) Reports). These reports, required biennially for each State, describe the water quality of all navigable waters in the State, as well as the nature and sources of pollution to the waters during the preceding two years.

waters identified as not meeting water quality standards (Section 303(d) Lists). This section requires States to list those waters for which (1) the limitations on effluent discharges (or releases of pollutants to a waterbody) are not stringent enough to implement water quality standards for the waters and (2) the limitations on thermal discharges (effluent with elevated temperatures) are not stringent enough to ensure protection and propagation of a balanced indigenous (native) population of shellfish, fish, and wildlife.

waterbody segments where major NPDES permits are to be issued; and

priorities within a watershed.

Additionally, waterbodies with water quality standards that do not meet the requirements of the CWA (i.e., do not provide for the protection of aquatic life or recreation) must be reexamined every three years. States must review their standards to determine if new scientific and technical data may be available which have a bearing on their standards. Further, environmental changes and economic development over time may warrant the need for a review. Where States have not adopted standards that provide for the protection of aquatic life or recreation, the State must periodically review standards to see if the "fishable/ swimmable" uses can be attained. In addition, States may have adopted water quality standards without sufficient data to determine whether the uses were attainable. Finally, changes in the CWA or EPA's regulations may necessitate State review of their standards to ensure continued compliance with Federal requirements.

States may use several ways to determine the appropriateness of a water quality standard. Generally, States will review intensive water quality survey and monitoring data, and any other information for a waterbody, to determine if uses are impaired or if water

quality criteria are exceeded. If uses are impaired or criteria exceeded, States will evaluate whether more stringent controls are needed to attain the water quality standard or whether the water quality standards are appropriate.

Part D: EPA's Role Following State or Tribal Adoption of Standards

The Governor or Tribal Authority (or designee) submits the State's or Tribe's officially adopted standards to the appropriate EPA Regional Administrator for review. The Regional Administrator reviews the standards to determine compliance with the CWA and implementing regulations. The Regional Administrator may approve or disapprove (in whole or in part) State or Tribal water quality standards based on the review. If the standards do not meet CWA requirements, the Regional Administrator must inform the State or Tribe of the changes needed to bring the standards into compliance. If the State or Tribe does not make the required changes, EPA begins a process that results in the promulgation (i.e., the issuance of a legally binding standard) of a Federal water quality standard for the affected waters. *Meanwhile, the standards adopted by the State or Tribe remain in effect until the promulgation process is complete or the State adopts revised water quality standards.* These requirements are listed in 40 CFR 131.6.

In addition, EPA is required under the Endangered Species Act to consult with the Fish & Wildlife Service (F&WS) and the National Marine Fisheries Service (NMFS) to determine if adverse effects to threatened or endangered species are likely. The F&WS is part of the U.S. Department of Interior, and the NMFS is part of the National Oceanic and Atmospheric Administration. The Endangered Species Act (ESA) was enacted in 1973. The ESA and subsequent amendments are intended to protect and preserve plants and animals whose populations have been threatened or impaired by the actions of humans.

EPA may also issue Federal regulations when the ***Administrator*** determines that a new or revised standard is necessary to meet the requirements of the CWA. Federal water quality standards are withdrawn when States or Tribes adopt standards that meet the statutory and regulatory requirements. At the present time, Federal actions of this type remain in force in Arizona, the Coleville Confederated Tribes Indian Reservation in Washington, the San Francisco Bay/Delta, and in 14 jurisdictions in the National Toxics Rule.

When issuing water quality standards that are binding on a State or on Tribal Lands, EPA must adhere to the same substantive requirements as the State or Tribe for adopting standards. Additionally, EPA at a minimum must

publish the proposed water quality standard in the Federal Register,

solicit public comments on the proposed standard,

hold a public hearing

analyze and incorporate public comments, and

publish the final water quality standard.

Part E: Enforcing Water Quality Standards

Water quality standards are not directly Federally enforceable under the CWA, but they provide a basis for establishing discharge limits in NPDES permits and Section 404 permits (those permits that allow for the disposal of dredge and fill material into surface waters). The permits are legally enforceable. Failure to comply with NPDES or dredge-and-fill permit limits can result in enforcement action. States, however, do have the option, under Section 510 of the CWA, to make water quality standards directly enforceable.

Part F: The Role of the Public in Setting Water Quality Standards

The public has a vested interest in our Nation's water quality. Open hearings on water quality standards provide an opportunity for the public to become involved in the water quality standards setting process. Citizens may make recommendations on improvements or modifications in the standards during the public hearing process. Public hearings are a powerful vehicle through which citizens may make their concerns known to public officials. States and Indian Tribes are required by law to hold hearings at least once every three years.

Part G: Available Guidance and Assistance

In addition to publishing Section 304(a) criteria guidance, EPA develops other informational materials to help the States and Indian Tribes meet the requirements of the water quality standards program. Such informational materials include technical publications, newsletters, and videotapes. Guidance materials are supplemented by training programs, technical assistance, workshops, meetings, and other forums conducted by EPA personnel. EPA personnel are also available for consultation. EPA encourages a free exchange of information in the Federal-State effort to clean-up and protect the Nation's waters. (Section VII of this document tells you where additional information about water quality standards and criteria can be obtained.)

Section VII: For More Information

EPA's ten Regional Offices (listed on page 31) can provide detailed information about the procedures by which an Indian Tribe may qualify for water quality standards program authorization. EPA is also available to provide technical information as Indian Tribes begin to develop water quality
standards affecting Reservation Lands.

Information on the water quality standards of a given State may be obtained from the State's Water Pollution Control Agency or its equivalent or directly from an Indian Tribe. Information may also be obtained from the Water Quality Standards Coordinator in each Regional Office identified on page 31.

You may also contact EPA at the following address for more information about water quality standards, including schedules for training programs and technical assistance workshops, documents and videos.

Specific information about water quality standards may be obtained from

U.S. Environmental Protection Agency
Office of Water
Office of Science & Technology
Standards & Applied Science Division
401 M Street, SW (4305)
Washington, DC 20460
(202) 260-1315

Specific information about water quality criteria, including site-specific criteria, may be obtained from

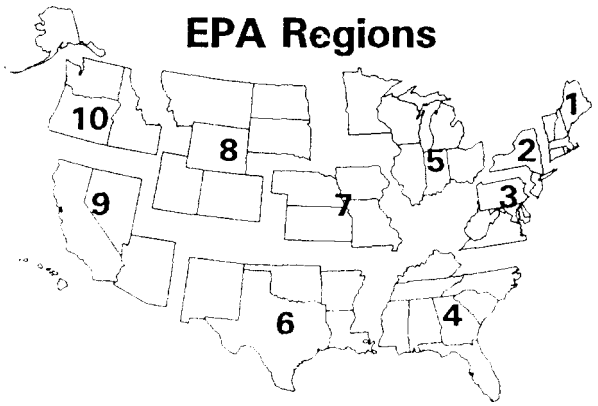
U.S. Environmental Protection Agency
Office of Water
Office of Science & Technology
Health & Ecological Criteria Division
401 M Street, SW (4304)
Washington, DC 20460
(202) 260-0658

To purchase a copy of *Quality Criteria for Water 1986,* containing summaries of all contaminants and conditions for which EPA has developed criteria recommendations, contact

National Technical Information Center
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
(800) 553-NTIS
Order Number: PB87-226759

or

Education Resource Information Center
1929 Kenny Road
Columbus, OH 43210
(800) 276-0462
Order Number: D-760



EPA Regional Water Quality Standards Coordinators

Region I Water Division
JFK Federal Building
Boston, MA 02203
(617) 565-3533
(617) 565-4940 (fax)
CT, ME, VT, MA, NH, RI

Region 2 Water Division
290 Broadway
New York, NY 10007
(212) 264-5685
(212) 637-3772 (fax)
NJ, NY, Puerto Rico, Virgin Islands

Region 3 Water Division
841 Chestnut Street
Philadelphia, PA 19107
(215) 597-4491
(215) 597-3359 (fax)
DE, DC, WV, MD, PA, VA

Region 4 Water Division
345 Courtland Street, N.E.
Atlanta, GA 30365
(4G4) 347-3555 x6633
(404) 347-1799 (fax)
AL, FL, GA, TN, KY, NC, SC, NIS

Region 5 Water Division
77 West Jackson Boulevard
Chicago, IL 60604-3507
(312) 353-9024
(312) 886-7804 (fax)
IL, IN, OH, MI, MN, W1

Region 6 Water Division
1445 Ross Avenue
First Interstate Bank Tower
Dallas, TX 75202
(214) 665-6643
(214) 665-6689 (fax)
AR, LA, NM, OK, TX

Region 7 Water Compliance Branch
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7441
(913) 551-7765 (fax)
IA, KS, MO, NE

Region 8 Water Division
999 18th Street
Denver, CO 80202-2405
(303) 293-1586
(303) 391-6957 (fax)
CO, MT, UT, ND, SD, WY

Region 9 Water Division
75 Hawthorne Street
San Francisco, CA 94105
(415) 744-1997
(415) 744-1078 (fax)
AZ, CA, NV, HI, Palau, Guam, American Samoa, N. Mariana Islands

Region 10 Water Division
(WS-139)
1200 Sixth Avenue
Seattle, WA 98101
(206) 553-0176
(206) 553-0165 (fax)
AK, ID, OR, WA

APPENDIX A: GLOSSARY

This glossary includes terms used in this document and additional terms that are frequently used in discussions of water quality standards.

The Act--refers to the Clean Water Act (Public Law 92-500, as amended (33 USC 1251, et seq.) (40 CFR 131.3)

acute--refers to short-term exposures to pollutants

Adminstrator-refers to the Administrator of the U.S. Environmental Protection Agency

ambient--refers to existing conditions in a waterbody

anthropogenic--generated or caused by the actions of humans

antidegradation policy--policy required by EPA's water quality standards regulation that States and Indian Tribes must adopt to conserve, maintain, and protect existing uses and the water quality necessary to protect these uses: the policy was established by the secretary of Interior in February 1968 before the creation of EPA and incorporated into the water quality standards regulation issued by EPA in November 1975

aquatic life criteria--guidelines designed to protect all aquatic life, including plants and animals

arbitration- a dispute resolution process in which an individual or panel recommends a solution to an issue arising between two parties. The solution recommended by the arbitrator can be binding on the parties if they choose to make it so.

attain -achieve or reach (as a water quality goal)

background conditions--natural conditions, conditions not affected or influenced by the activities of humans

biological integrity--the condition of the aquatic community inhabiting unimpaired water bodies of a specified habitat as measured by community structure and function

biological criteria--narrative or numeric expressions that describe the desired biological condition of aquatic communities inhabiting particular types of waterbodies

chronic–refers to long-term expposures to pollutants

Code of Federal Regulations–a publication of the U.S. Government that contains all EPA and other regulations after they have received final approval. Reffered to as CFR.

designated use--that use defined in water quality standards for each water body or segment whether
or not the use is being attained

discharge limits--any restriction on quantities, rates, and concentrations of chemical, physical, biological or other constituents which are discharged from point sources

discharge--the addition of any pollutant(s) to navigable waters from any point source.

dredge material–material resulting from activities such as the widening or deepening of channels, building of canals, construction of levees

ecology (ecological)--the study of the interrelationships of organisms and their environment

effluent--waste material discharged into the environment, including waters of tile United States

existing use--the use that has been achieved for a waterbody on or after November 28. 1975

Federal Register--a publication of the U.S. Government that includes all proposed and filial regulations issued by EPA. Referred to as "FR."

fill material--earth used for embankments or as backfill

Food and Drug Administration–the U.S. Government agency that establishes limits used to prohibit the sale of edible aquatic life when the concentrations of contaminants exceed specified levels

habitat–the environment occupied by individuals of a particular species, population or community

human health criteria--guidelines that specify the potential risk of adverse effects to humans due to substances in the water

hydrology (hydrologic)--the science dealing with the proper-ties, distribution, and circulation of water both on the surface of and under the earth

impaired waters--waters that fail to meet applicable water quality standards or to protect designated uses (such as fishing or swimming)

Indian Tribe or Tribe--any Indian Tribe, band, group, community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation

Indian Reservation (Reservation, Tribal Lands)--all land within the limits of any Indian reservation under the jurisdiction of the U.S. Government, notwithstanding the issuance of any patent, and including rights of way running through the reservation

indigenous--existing, and having originated naturally, in a particular region or environment

Issue Dispute Resolution Mechanism--the procedure contained in the Clean Water Act for resolving conflicts between States and Indian Tribes that adopt different water quality standards on a common body of water

mediation--a dispute resolution process in which a neutral or impartial individual attempts to facilitate a solution to a dispute arising between two parties by encouraging communication and negotiation

Naitional Pollutant Discharge Elimination System--the EPA program that regulates point source discharges through the issuance of permits to discharges and enforcement of the terms and conditions of those permits

navigable waters--the waters of the United States, including the territorial seas

non-point source pollution--pollution sources that are diffuse and do not have a single point of origin: run-off from agriculture, forestry, and construction sites can be non-point source pollution

organic substance--carbon-containing substances in plant and animal matter; high concentrations are often found in municipal and industrial wastewater and in surface runoff; organic chemicals refers to a manufactured chemical used for controlling weeds and insect pests; many are considered to be carcinogenic

Outstanding National Resource Waters--the highest quality waters of the United States; waters of' exceptional ecological significance that are important, unique, or ecologically sensitive.

permit--legal authority to carry out a regulated activity

point source pollution--pollution resulting from discharges into receiving waters from any discernible, confined, and discrete conveyance, such as a pipe, ditch, or sewer

priority toxics or pollutants–those substances listed by the Administrator under Section 307(a) of the Clean Water Act

promulgate--to make known or public the terms of a proposed regulation, or to put a regulation into action or force

Regional Administrator--the senior official in an EPA Regional Office

rulemaking--the process by which regulations or laws are enacted

sediment(s)--transported or deposited particles derived from rocks, soils, or biological materials

sediment criteria–narrative or numeric expressions that describe the desired condition of sediments in particular types of waterbodies; sediment criteria address the toxicity of different sediment types in different environmental settings

States--includes the 50 United States, District of Columbia, Guam, Commonwealth of Puerto Rico, Virgin Islands, American Samoa, Trust Territory of the Pacific Islands, and Commonwealth of the Northern Mariana Islands, and Indian Tribes that EPA determines qualify for treatment as States for the purpose of water quality standards

statute (statutory)--a law (having legal force)

surface waters--bodies of water on the surface of the earth, including lakes, rivers, streams, wetlands, etc.

toxic substance/pollutant--substances (or pollutants) that, after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly frorn the environment or indirectly by ingestion through food chains, will, or on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring

Use Attainability Analysis--a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in Section 131.10(g)(40 CFR 131.3)

water quality standards--provisions of State or Federal law which consist of a designated use or uses for the waters of the United Sates, water quality criteria for such waters based upon such uses, and an antidegradation policy; water quality standards are intended to protect public health and welfare, enhance the quality of water, and serve the purposes of the Clean Water Act

water quality criteria--criteria published by EPA under Section 304(a) for specific chemicals in water intended to provide protection for aquatic life and human health in all surface waters on a national basis; elements of water quality standards adopted by States under Section 303(c), which describe the quality of water that will support a particular use

waters of the United States--refer to

(1) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) all interstate waters, including interstate wetlands;

(3) all other waters such as intrastate lakes, rivers, streams (including intermittent strearns), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use or degradation of which would affect or could affect interstate or foreign commerce, including any such waters:

(i) which are or could be used by interstate or foreign travelers for recreational or other purposes;

(ii) front which fish or shellfish are or could be taken and sold in interstate or foreign commerce;

(iii) which are or could be used for industrial purposes by industries in interstate commerce;

(4) all impoundments of waters otherwise defined as waters of the United States under this definition;

(5) tributaries of waters in paragraphs (1) through (4) of this definition;

(6) the territorial sea; and

(7) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition. "Wetlands" are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include marshes, swamps, bogs, and similar areas.

Note: Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Act (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria for this definition) are not waters of the United States.

watershed-the region draining into a river, river system, or other waterbody

wetland--those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of' vegetation typically adapted for life in saturated soil conditions; wetlands generally include swamps, marshes, bogs, and similar areas

APPENDIX B
LIST OF SECTION 307(A) PRIORITY TOXIC POLLUTANTS

Acenaphthene
Acenapthylene
Acrolein
Acrylonitrile
Aldrin
Antimony
Anthracene
Arsenic
Asbestos
1,2 Benzanthracene
Benzene
Benzidine
Benzo (A) Pyrene
(3,4 Benzopyrene)
3,4 Benzofluoranthene
Fluoranthene
Benzo (K)
1,12 Benzoperylene
Beryllium
Bromoform
(Tribromomethane)
Bromomethane (Methyl
Bromide)
4 Bromophenyl Phenyl
Ether
Cadmium
Carbon Tetrachloride
Tetrachloromethane
Chlordane
Chlorobenzene
(Monochlorobenzene)
Chlorodibromomethane
(Halomethane)
Chloroethane
(Monochloroethane)
Chloroethyl Ether (Bis-2)
1 Chloroethoxy Methane
(Bis-2)
2 Chloroethyl Vinyl Ether
4 Chloro-3-Methylphenol
Chloromethane (Methyl
Chloroform
(Trichloromethane)
2 Chlorophenol
Chloroisopropyl Ether
(Bis-2)
2 Chloronaphthalene
4 Chlorophenyl Phenyl
Ether
Chromium (HEX and TRI)
Chrysene
Copper
Cyanide
4,4 DDT
4,4 DDE
4,4 DDD
Dibenzo (a,h) Anthracene
1,2 Dichlorobenzene
1,3 Dichlorobenzene
1,4, Dichlorbenzene
3,3 Dichlorobenzidine
1,1 Dichloroethane
1,2 Dichloroethane
1,1 Dichloroethylene
1,2 Trans-Dichloroethylene
Dichlorobromomethane
(Halomethanes)
2,4,Dichlorophenol
1,2 Dichloropropane
1,3 Dichloropropylene
Dieldrin
2,4 Dimethylphenol
Diethylphthalate
Dimethylphthalate
2,4 Dinitrotoluene
2,6 Dinitrotoluene
2,4 Dinitrophenol
Dioxin (2,3,7,8-TCDD)
1,2 Diphenylhydrazine
Alpha Endosulfan
Beta Endosulfan
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Ethylbenzene
Fluorene
Fluoranthene
Heptachlor
Heptachlor Epoxide
Hexachloroethane
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclohexane
(Lindane)
Hexachlorocyclohexane
(Alpha)
Hexachlorocyclohexane
(Beta)
Hexachlorocyclohexane
(Delta)
Hexachlorocyclopentadiene
Ideno (1,2,3-cd) Pyrene
(PAH)
Isophorone
Lead
Mercury
Naphthalene
Nickel
Nitrobenzene
2 Nitrophenol
4 Nitrophenol
4,6 Dinitro-2-Methylphenol
Nitrosodimethylamine N
Nitrosodiphenylamine-N
Nitrosodi-N-Propylamine-N
PCB 1242
PCB 1254
PCB 1221
PCB 1232
PCB 1248
PCB 1260

PCB 1016
Phenol
Pentachlorophenol
Phenanthrene (PAH)
Bis (3 Ethyl Hexyl)
Phthalate
Butyl Benzyl Phthalate
Di-N-Butyl Phthalate
Di-N-Octyl-Phthalate
Pyrene (PAH)
Selenium
Silver
1,1,2,2 Tetrachloroethane
Tetrachloroethylene
Thallium
Toluene
Toxaphene
L2,4 Trichlorobenzene
1,1,1 Trichloroethane
1,1,2 Trichloroethane
Trichloroethylene
2,4,6 Trichlorophenol
Vinyl Chloride
(Chloroethylene)
Zinc