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Office of Water
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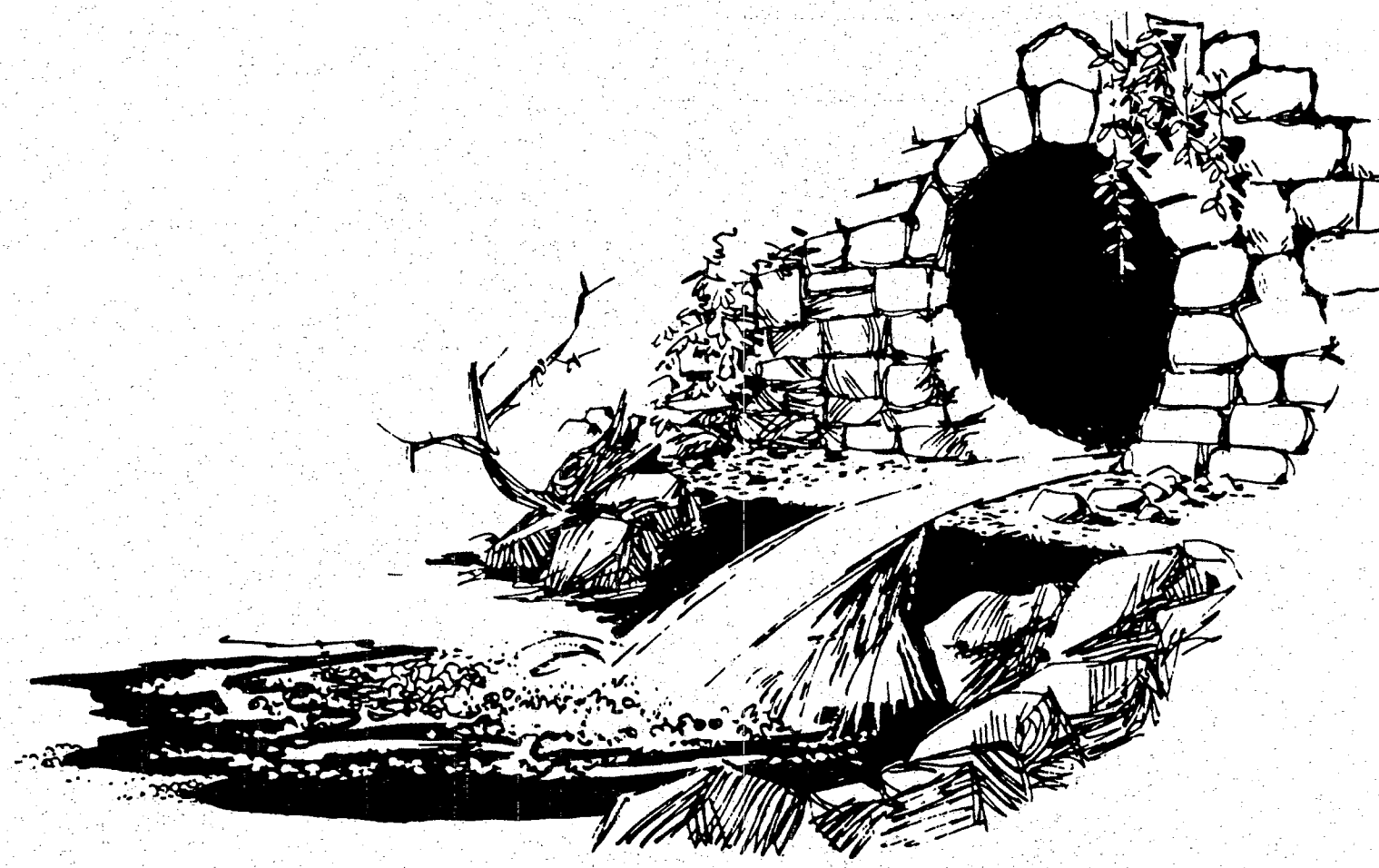
JULY 31, 2001

EPA

Guidance: Coordinating CSO Long-Term Planning With Water Quality Standards Reviews



United States Environmental Protection Agency | Office of Water (4203M) | EPA-833-R-01-002 JULY 31, 2001

GUIDANCE:

COORDINATING CSO LONG-TERM PLANNING

WITH

WATER QUALITY STANDARDS REVIEWS

NOTICE

The *Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews* is designed to address questions on integrating development of CSO long-term control plans (LTCPs) with water quality standards reviews. These questions have been raised since the 1994 publication of the CSO Control Policy, and EPA is responding to them by expanding on its existing guidance.

The guidance included in this document cannot impose legally binding requirements on EPA, states, tribes, or the regulated community. It cannot substitute for Clean Water Act (CWA) requirements, EPA's regulations, or the obligations imposed by consent decrees or enforcement orders. Further, this guidance might not apply to a particular situation based upon the circumstances.

FOREWORD

EPA issued the Combined Sewer Overflow (CSO) Control Policy in April 1994 (59 FR 18688). To date, EPA has released seven guidance documents and worked with stakeholders to foster implementation of the Policy. EPA continues to affirm the Policy's key themes, such as providing clear levels of control, using a flexible permitting approach, allowing phased implementation of CSO controls based on a community's financial capability, and reviewing and revising, as appropriate, water quality standards. In practice, many challenges remain, and implementation of the Policy has not met some initial expectations.

The CSO Policy calls for the development of a long-term control plan (LTCP) which includes measures that provide for compliance with the Clean Water Act, including attainment of water quality standards. LTCP development that is consistent with the CSO Policy is key to the success of local CSO control efforts. The CSO Policy provides that "*[d]evelopment of the long-term plan should be coordinated with the review and appropriate revision of water quality standards (WQS) and implementation procedures on CSO-impacted receiving waters to ensure that the long-term controls will be sufficient to meet water quality standards*" (59 FR 18694). In the seven years since EPA issued the CSO Control Policy, implementation of this principle has not progressed as quickly as expected.

Given local resource constraints, CSO communities need clear guidance on how they should implement the CSO control and other wet weather water pollution control programs to attain water quality standards. Water quality standards reviews are an important step in integrating the development and implementation of affordable, well-designed and operated CSO control programs with the requirements of the Clean Water Act (CWA). However, the Agency recognizes that State and Interstate Water Pollution Control Directors will need to set priorities for water quality standards reviews based on a number of factors, including court-mandated total maximum daily load (TMDL) analyses. EPA plans to actively participate in and facilitate the process wherever possible.

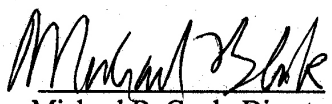
As part of EPA's FY 1999 Appropriation, Congress directed EPA to develop guidance on the conduct of water quality standards and designated use reviews for CSO receiving waters. Congress further urged EPA to provide technical and financial assistance to states and EPA Regions to conduct these reviews. In response, EPA hosted three stakeholder listening sessions in the spring of 1999 and an experts workshop on September 24, 1999. The purpose of these meetings was to obtain participants' views on the impediments to implementing the water quality-based provisions in the CSO Policy, and actions that EPA should take. In December 2000, Congress enacted CWA amendment 402(q)(2) requiring publication of the guidance by July 31, 2001, after public review and comment. The *Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews* addresses many of the stakeholder concerns.

The objective of this guidance is to lay a strong foundation for integrating CSO long-term control planning with water quality standards reviews. Agreement among CSO communities, states, and EPA on the data to be collected and the analyses to be conducted to support the long-

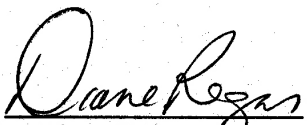
term control plan development and water quality standards reviews can facilitate water quality standards reviews for CSO-receiving waters.

The guidance describes the process for integrating LTCP development and implementation with the water quality standards review. This process is the essence of EPA's commitment to facilitating the review and revision, as appropriate, of water quality standards for CSO-impacted receiving waters. Integrating CSO long-term control planning with water quality standards reviews requires greater coordination among CSO communities, states, EPA, and the public. Although this coordination is an intensive process, it provides greater assurance that CSO communities will implement affordable CSO control programs that support the attainment of appropriate water quality standards.

As outlined in the guidance, EPA will continue to implement the CSO Control Policy through its existing statutory and regulatory authorities. The principal mechanisms are the National Pollutant Discharge Elimination System (NPDES) permit program and the water quality standards program. NPDES authorities are and will continue to be responsible for implementing the CSO Control Policy. EPA commits to working with State and Interstate Water Pollution Control Directors to implement all aspects of the CSO Control Policy, including the integration of LTCP development with the review and revision, as appropriate, of water quality standards.



Michael B. Cook, Director
Office of Wastewater Management
Date: 7/31/01



Diane C. Regas
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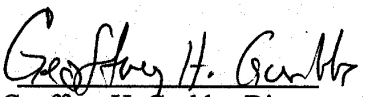

Geoffrey H. Grubbs, Director
Office of Science and Technology
Date: 7/24/01

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GLOSSARY

Best management practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972). It is codified in Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483 and Public Law 97-117, 33 U.S.C. 1251 et seq.

Combined sewage means domestic and industrial wastewater and storm drainage carried in the same pipe.

Combined sewer is a sewer designed to carry domestic and industrial wastewater and storm water runoff in the same pipe.

Combined sewer overflow ("CSO") means the portion of flow from a combined sewer system (CSS) that discharges into a water body from an outfall located upstream of the headworks of a POTW, usually during a rainfall event or the outfall pipe which carries this discharge.

Criteria are elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.

Designated uses are those uses specified in water quality standards for each water body or segment whether or not they are being attained.

Environmental Protection Agency ("EPA") means the United States Environmental Protection Agency.

Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.

Infiltration means water other than wastewater that enters a wastewater system and building sewers from the ground through such means as defective pipes, pipe joints, connections, and manholes. (Infiltration does not include inflow.)

Infiltration and inflow ("I/I") means the total quantity of water from both infiltration and inflow.

Inflow means water other than wastewater that enters a wastewater system and building sewers from sources such as roof leaders, cellar drains, yard drains, area drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm drains and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, and drainage. (Inflow does not include infiltration.)

Interceptor sewer means a sewer without building sewer connections that is used to collect and carry flows from main and trunk sewers to a central point for treatment and discharge.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under state law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of CWA.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program."

Peak flow means the maximum flow that occurs over a specific length of time (e.g. daily, hourly, instantaneous).

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff. (See §122.3).

Publicly Owned Treatment Works, or POTW, means a treatment works as defined by section 212 of the CWA, that is owned by a state or municipality (as defined by section 502(4) of the CWA). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW treatment plant. The term also means the municipality as defined in section 502(4) of the CWA, which has jurisdiction over the indirect discharges to, and the discharges from, such a treatment works.

Storm water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Total maximum daily load (TMDL) is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources, as described in 40 CFR 130.2(g)-(i)

Use attainability analysis (UAA) is a structured scientific assessment of the factors affecting the attainment of a designated use, such as physical, chemical, biological, and economic factors as described in §131.10(g).

Variance is a discharger-specific, short-term modification to the applicable water quality standard. A legal permit for the discharger may be based on a variance.

Water quality standards are provisions of state or federal law which consist of a designated use or uses for the waters of the United States, water quality criteria to protect the most sensitive uses for such waters, and an antidegradation policy and implementation procedures to protect water quality. Water quality standards are established to protect the public health or welfare, enhance the quality of water and serve the purposes of the CWA.

Wet weather flow means dry weather flow combined with storm water introduced into a combined sewer, and dry weather flow combined with inflow in a separate sewer.

I. INTRODUCTION

1. Why is EPA developing this guidance?

This guidance demonstrates the U.S. Environmental Protection Agency (EPA)'s renewed commitment to assuring that states and communities with combined sewer systems participate in implementing the water quality-based provisions in the Combined Sewer Overflow (CSO) Control Policy. The CSO Control Policy anticipates the "review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect site-specific wet weather impacts of CSOs."

As part of EPA's FY 1999 Appropriation, Congress urged the Agency to facilitate water quality and designated use reviews for CSO receiving waters by developing guidance for states and Regional Offices. To develop this guidance, EPA held three listening sessions and a September 1999 EPA-Water Environment Federation (WEF) experts workshop. EPA sought and received a wide range of diverse perspectives on impediments to implementing the water quality-based provisions in the CSO Control Policy, by talking with state and EPA staff, CSO communities and their consultants, and environmental and watershed organizations. The listening sessions and the experts workshop confirmed a need for guidance and clarifications in the existing regulatory requirements and options available to the state in revising water quality standards.[1] In December 2000, Congress added Section 402(q) to the CWA to require publication of this guidance by July 31, 2001. EPA prepared a draft guidance for public review and comment (66 FR 364, January 3, 2001). EPA received comments from 27 interested parties. EPA reviewed the comments and made appropriate changes to the draft guidance in response to the submitted comments.

This guidance lays a strong foundation for integrating water quality standards reviews, implementation of high-priority CSO controls, and development of well-designed and operated LTCPs that support attainment of water quality standards without causing substantial and widespread economic and social impacts. This integration occurs through increased coordination and cooperation among CSO communities, constituency groups, states and EPA. Through increased coordination and cooperation, CSO communities and states will be better able to address the many scientific, technical, and economic issues involved in developing LTCPs that

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[1] EPA summaries of the listening sessions and of the experts workshop are: (1) *Summary of the Listening Sessions* (EPA-823-R-99-017) and (2) S*ummary of Participant Comments at the EPA-WEF Experts Workshop* (EPA-823-R-99-016)). You can find these documents at www.epa.gov/ost/cso or request hard copies from:

U.S. EPA/NSCEP
P.O. Box 42419
Cincinnati, OH 45242-2419
Phone: 1-800-490-9198 or (513) 489-8190
Fax: (513) 489-8695
Web Site: www.epa.gov/ncepi.htm

comply with permit requirements based on applicable water quality standards, and in determining if revisions to the standards are appropriate.

This guidance applies to the development and implementation of CSO LTCPs. However, many of the processes, procedures and ideas presented here can be used to address wet weather issues such as storm water and other point and nonpoint sources on a watershed basis.

2. What is EPA's goal?

EPA's goal is for CSO communities to develop and implement cost-effective LTCPs that achieve compliance with applicable water quality standards and with other CWA requirements, and for states to review and revise water quality standards as appropriate to ensure they are attainable. By phasing the implementation of CSO controls and evaluating their efficacy as they are installed, communities and states can manage the complexities of: (1) improving the quality of urban waters affected by many sources; (2) financing the high costs of structural CSO controls; and (3) integrating LTCP development and implementation with water quality standards reviews.

During LTCP development, EPA expects communities to identify priority controls for sensitive areas, such as elimination or treatment of an overflow that impacts a bathing area. These priority controls should be common to all LTCP scenarios, and therefore should be implemented expeditiously. Following installation of these controls, communities and states will need to collect post-construction compliance data to evaluate the effectiveness of the controls in improving water quality and supporting the uses of the water body. If the data show that with the installed controls CSOs will continue to contribute to the impairment of water quality standards, the NPDES authority should work with the CSO community to evaluate other CSO control alternatives identified in the LTCP. If, however, chemical, physical or economic factors appear to preclude attainment of the use, the data collected during the planning process may be used to support revisions to water quality standards. These revisions could include adoption of uses that better reflect the water quality that can be achieved with a level of CSO control that does not cause substantial and widespread economic and social impact.

Greater levels of coordination are needed to integrate CSO control planning and implementation with water quality standards reviews. This guidance will clarify the roles and responsibilities in this process for CSO communities, NPDES and water quality standards authorities, community and environmental organizations, and EPA.

EPA plans to participate actively in the process and will encourage others to participate actively. With increased coordination and cooperation, and the active participation of all entities in integrating the CSO long-term control planning processes and water quality standards reviews, states should be able to revise water quality standards as appropriate in cases where standards are not attainable, and communities should be able to develop LTCPs that provide for the attainment of water quality standards.

3. What is included in this guidance?

This guidance focuses on improving the implementation of the water quality-based provisions in the CSO Control Policy by: (1) outlining ways to improve the level of coordination and cooperation among CSO communities, State Water Directors[2], community and environmental organizations, and EPA; (2) integrating development of the LTCP and implementation of high-priority controls with the review and revision, as appropriate, of water quality standards; and (3) reconciling water quality standards with well-designed and operated CSO LTCPs without causing substantial and widespread economic and social impacts.

A. Existing program framework

This guidance summarizes the statutory and regulatory requirements governing the CSO control program and the water quality standards program. The discussion also covers policy and existing guidance documents that support the integration of LTCP development and implementation with water quality standards reviews.

CSO Program Framework

Under the CSO Control Policy, communities with combined sewer systems are expected to develop LTCPs that provide for attainment of water quality standards. By law, discharges that remain after implementation of the LTCP must not interfere with the attainment of water quality standards. More detailed information on the process for developing and implementing an LTCP is provided in *Combined Sewer Overflows - Guidance for Long-Term Control Plans*. Appendix I includes an annotated bibliography of all the CSO guidance documents.

EPA offers two approaches for CSO communities to consider when evaluating CSO control options and ultimately selecting alternatives. These are:

- The "presumption approach," under which achievement of certain performance criteria (i.e., 4-6 untreated overflow events or 85 percent by volume capture) would be presumed to provide an adequate level of control to attain water quality standards;
- The "demonstration approach," developing and implementing an LTCP that meets applicable water quality standards.

Both approaches would entail post-construction compliance monitoring to demonstrate attainment of water quality standards.

In selecting the demonstration approach, a community would have several options for developing an LTCP to meet applicable water quality standards. A community could, for

[2] State Water Directors could include State and Interstate Water Pollution Control Directors or other entities responsible for NPDES permits, enforcement and water quality standards.

example, develop an LTCP that would provide for attainment of currently-applicable water quality standards, or it could use a total maximum daily load (TMDL) to demonstrate that water quality standards can be attained through a combination of CSO controls and other controls. This document describes a third alternative: Working with water quality standards and NPDES authorities to integrate water quality standards reviews and revisions, as appropriate, with the development of a CSO control program that supports the attainment of water quality standards without causing substantial and widespread economic and social impacts.

Water Quality Standards Program Framework

The CWA establishes the statutory framework governing the development of water quality standards and their use. Congress set an interim goal in section 101(a)(2) of the CWA to provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water. Section 303 of the CWA directs states and tribes, where authorized, to adopt water quality standards that protect human health and welfare, enhance the quality of water, and serve the purposes of the CWA. Requirements for water quality standards are further elaborated by EPA regulations for the program, found at 40 CFR Part 131.

With the public participating, states adopt water quality standards that set the water quality goals for the water body, serve as the legal basis for TMDLs and the applicable permit requirements for point sources, and provide the program goals for nonpoint source management programs. Section 402(a) of the CWA specifically require NPDES permits to provide for the attainment of water quality standards.

The CWA requires states to review their water quality standards at least once every three years. Any new or revised water quality standards must be approved by EPA before the standards can be used for CWA purposes, such as the basis for a TMDL or a permit limit.

States have considerable discretion to tailor water quality standards to particular climatic, hydrologic and seasonal conditions. This discretion, however, is not unlimited. State water quality standards must protect public health and the environment by enhancing and maintaining the quality of the water. To protect the uses designated in their water quality standards, states adopt: (1) a suite of criteria to protect the most sensitive of the designated uses; and (2) an anti-degradation policy including implementation procedures to protect water quality. In designating uses for a water body and adopting criteria to protect those designated uses, states consider the attainability of the uses, as well as the protection of downstream uses.

The most common state use classification systems are based on general categories of uses (e.g. fish and aquatic life and recreation) or qualitative uses (e.g. Class AA - remarkable, Class A - excellent). Tables 2 through 7 illustrate the various types of state use classification systems.

States protect recreational uses by adopting the appropriate criteria (*E. coli* or enterococci). In urban areas, where water-based recreational opportunities may be limited, states need to protect children who frequently splash in waters that otherwise would be considered too shallow for adults.

This guidance also discusses applying the appropriate criteria at the point of contact rather than at the "end-of-pipe" and use of less stringent criteria when water is unlikely to be ingested or when the recreational use is unlikely to occur, e.g., during the winter. Some states are building flexibility into their water quality standards while also protecting public health by adopting sub-categories of uses. For instance, for a CSO receiving water body, a modified use may entail precluding swimming during or immediately following a CSO event when bacterial counts are elevated.

Examples are provided showing how some states are defining more explicitly the type of aquatic life that exists in the water body. These state use classification systems provide the public with a better understanding of the type of fish and other aquatic life to be protected by the water quality standards. When the aquatic life in a water body is more explicitly defined, states and the public are better able to evaluate the potential of the water body to support healthier aquatic communities. Also identified are the steps and data that would be necessary to develop a tiered aquatic life system with subcategories for urban systems.

B. Reviewing and revising, as appropriate, water quality standards

Depending on the CSO impacts, possible water quality standards revisions could include:

1. Applying the *Ambient Water Quality Criteria for Bacteria -- 1986* (i.e., *E. coli* or enterococci) at the beach or at the point of contact rather than at the end-of-pipe or at the edge of the mixing zone where permits may require compliance with other criteria;
2. Segmenting the water body to preserve recreation in areas where it actually occurs;
3. Revising the use by creating subclasses to recognize intermittent exceedances of bacteriological criteria.

Chapter III of this guidance describes the regulatory requirements, analyses, and documentation needed to demonstrate that there are reasons unrelated to water quality (e.g., physical or economic) for a water body to not fully support the designated uses. The guidance identifies the six bases, any one of which states may use to justify revisions to designated uses (see 40 CFR 131.10(g)(1)-(6)). Appendix II provides additional information on how and when designated uses may be removed.

Also outlined are the circumstances under which states may not change their designated uses. For example, states may not change a use if the use is an existing use or the use can be

attained by implementing effluent limits required under sections 301(b) and 306 of the CWA and by implementing cost-effective and reasonable best management practices for nonpoint source controls (40 CFR 131.10(h)(2)).

States proposing revisions to designated uses that lower the level of protection afforded a water body (e.g., reducing the number of recreational use days) must submit to the public and to EPA a use attainability analysis (UAA; see 40 CFR 131.10(j)). A UAA is a structured scientific assessment of the physical, chemical, biological and economic factors affecting the attainment of the use. To support a revision, the UAA must provide sufficient information for the state, public and EPA to determine that the use is not attainable. The UAA must also provide sufficient information for the state to adopt an alternative use and the criteria to protect it. States may designate an alternative use based on the demonstrated water quality improvements from an affordable, well-designed and operated CSO control program.

Substantial guidance is available on conducting aquatic life-use UAAs and on performing economic analyses for recreation and aquatic life uses (see Appendix III). This guidance builds on these documents by identifying how an LTCP can serve as the foundation for a UAA. In particular, Appendix IV discusses recreational UAAs. This guidance explains in greater detail the analyses needed to justify revisions based on the determination that the level of control necessary to attain water quality standards is not affordable because the costs of the controls would cause "substantial and widespread economic and social impact" (40 CFR 131.10(g)(6)).

This document identifies ways in which the UAA can be simplified. Common sense and good judgment play a role. An important way to simplify UAAs is for the community, state and EPA to reach agreement prior to initiating the UAA on the data to be collected, analyses to be conducted, and critical factors to be used in interpreting the results.

C. Integrating CSO LTCP development and implementation with water quality standards reviews

A key principle of the CSO Control Policy is the "review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs." EPA believes that communities and states can integrate the development of affordable, well-designed and operated CSO control programs, implementation of high-priority controls, and review (and revision, where appropriate) of water quality standards.

The implementation of CSO controls identified in a well-designed and operated LTCP may lead to the determination that a water body has the potential of supporting improved aquatic life. Under this circumstance, states would upgrade their designated aquatic life use for the water body. Alternatively, implementation of a well-designed and operated LTCP may not necessarily ensure the attainment of water quality standards within the CSO receiving water. Where existing standards cannot be met, CSO communities, states, and EPA will need a more intensive process

than that described in the *Guidance for Long-Term Control Plan*. The objective of this more intensive approach, shown in Figure 1, is for the State Water Director, EPA and the CSO community to reach early agreement on the data and analyses that will be sufficient to support both the development and implementation of the LTCP and the water quality standards review.

The Agency recognizes that communities are at various stages of CSO abatement efforts. This document presents a process that starts with the initiation of LTCP development. The process is flexible and can be tailored to programs that are currently in the process of implementing the LTCP or that have completed implementation and find that the remaining overflows continue to contribute to the exceedance of water quality standards.

State Water Directors and EPA may need to establish priorities and develop schedules to participate in the more intensive process. For example, if the CSO receiving water body has been included on the state's 303(d) (impaired waters) list for bacteria or other pollutants common to CSO discharges, the state should coordinate the schedule for developing a TMDL with the schedule for developing the CSO LTCP, before deciding upon the schedule for the water quality standards review.

This guidance describes the steps for integrating the development and implementation of the LTCP with the review and revision, where appropriate, of water quality standards. Where available information is not sufficient to support a water quality standards review, EPA expects that communities will install the controls common to all relevant LTCP alternatives while collecting additional information that would support revisions to water quality standards. Where available information demonstrates that water quality standards revisions are appropriate, EPA expects that States will make appropriate revisions to water quality standards to enable communities to implement LTCPs that comply with NPDES permit requirements and provide for attainment of water quality standards.

A few states have developed the mechanisms in their water quality standards program frameworks to integrate water quality standards reviews with long-term control plan development. Use of continuous simulation modeling and allowances for a limited number of overflows to define the use are examples. Another approach under consideration in some states is adopting a high flow cutoff. Conceptually, EPA has no objection to a high flow cutoff for bacteria and recreational uses. In the past, several states have explored high flow cut-offs, but *to date* have been unable to *design a standard that adequately balances the need to address the challenges produced by high flow situations with appropriate water quality protection. EPA is willing to continue exploring this approach with the States.*

This guidance also affirms that EPA will work with the NPDES authorities to ensure that permits, orders and decrees conform with the CSO Control Policy. In addition, EPA will track and make available to the public information on CSO programs and water quality standards reviews.

D. The watershed approach

Chapter V discusses how CSO control planning and implementation fit into the watershed approach. EPA recognizes that urban water quality may be affected by a combination of CSOs, storm water discharges, other point sources and nonpoint source runoff. These sources may be most effectively addressed on a watershed basis or through TMDL analyses. The CSO Policy encourages permitting authorities "to evaluate water pollution control needs on a watershed management basis and coordinate CSO control efforts with other point and nonpoint source control activities." EPA strongly endorses and provides financial assistance to local watershed efforts.

Some states do use a watershed approach in one or more of their water programs, such as monitoring, designating uses, reviewing water quality standards or issuing permits. If CSO LTCPs are integrated with an on-going TMDL or watershed analysis, EPA expects that communities will implement high priority controls while TMDLs or watershed plans are being completed. An iterative, phased implementation of CSO controls fits well with the watershed approach.

II. EXISTING PROGRAM FRAMEWORK

1. CSO Program Framework

A. What is the statutory authority for controlling CSOs?

CSOs are point source discharges to the waters of the United States and are therefore subject to section 301(a) of the CWA and the implementing regulations for the NPDES Program. The CSO Control Policy provides a national framework and guidance for controlling CSOs consistent with CWA requirements. The Policy is a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, EPA and the public engage in a comprehensive and coordinated planning effort to achieve cost effective CSO controls that ultimately meet appropriate water quality standards. On December 21, 2000, the CWA was amended by Section 402(q)(1), which requires that all permits, orders and decrees issued after the date of enactment conform with the CSO Control Policy.

B. What are the technology-based requirements for controlling CSOs?

The minimum technology-based controls are the nine minimum controls (NMC)[3] as determined on a site-specific basis by the NPDES authority. The CSO Control Policy calls for all communities to implement the NMC. The NPDES entity determines whether the NMC satisfy the technology-based requirements of the CWA based on factors in the NPDES regulations.[4] The CSO Control Policy expected that all communities would implement the NMC by January 1, 1997.

C. What are the water quality-based requirements for controlling CSOs?

Under the CSO Control Policy, communities with combined sewer systems are expected to develop LTCPs to provide for the attainment of water quality standards and compliance with other CWA requirements. By law, discharges that remain after implementation of the CSO controls must not interfere with the attainment of water quality standards. In developing LTCPs, communities should examine a range of CSO control alternatives and evaluate the potential CSO reductions and water quality improvements from each alternative. The CSO Control Policy

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[3] The nine minimum controls are: proper operation and maintenance of collection systems; maximum use of the collection system for storage; review and modification of pretreatment to assure CSO impacts are minimized; maximum flow to the POTW for treatment; elimination of dry weather overflows; control of solid and floatable materials in CSOs; pollution prevention; public notification; and monitoring.

[4] The factors in 40 CFR 125.3(d)(2) and (3) cover BCT and BAT. These factors include: the reasonableness of the relationship between the costs of attaining a reduction in the effluent and the effluent reduction benefits; the age of the equipment and facilities involved; process employed; engineering aspects of the various types of control techniques; process changes; and non-water quality environmental impact (including energy requirements).

recommends that communities give the highest priority to eliminating, relocating or treating overflows to protect the designated uses in sensitive areas. Sensitive areas include areas with primary contact recreation, drinking water supplies, shellfish beds, and waters with threatened and endangered species and their critical habitats.

In developing their LTCPs, communities evaluate controls to address a reasonable range of alternatives. For example, the LTCP should evaluate controls that achieve zero overflow events per year, an average of one to three, four to seven, and eight to twelve overflow events per year. Alternatively, communities could evaluate controls that would achieve 100 percent, 95 percent, 90 percent, 85 percent, 80 percent, and 75 percent capture for treatment. The CSO Control Policy also recommends that communities evaluate modifying the operation of the POTW or expanding primary and/or secondary treatment capacity to handle larger flows during storm events. These controls can include consideration of a range of structural controls such as sewer separation, retention structures, or high-rate treatment. The costs of the various controls vary widely based on local conditions. This analysis of control alternatives should be sufficient to make a reasonable assessment of costs and the expected performance of the various alternatives.

D. What options are available in developing an LTCP that meets the intent of the water quality-based provisions of the CSO Control Policy?

The CSO Control Policy offers two approaches for CSO communities to consider in developing LTCPs. These are:

- The "presumption approach," with performance criteria (i.e., 4-6 untreated overflow events or 85 percent by volume capture) used as an endpoint for LTCP development and implementation; and
- The "demonstration approach," which entails developing and implementing an LTCP that includes a suite of CSO controls sufficient to meet applicable water quality standards;

Under either approach, the CSO community will need to plan controls to allow cost-effective expansion or cost-effective retrofitting, if additional controls are subsequently determined to be necessary based on the results of a post-construction monitoring program.

The presumption approach presumes the LTCP provides an adequate level of control to meet the water quality-based requirements of the CWA if the LTCP meets the performance criteria stipulated in the CSO Control Policy. Under the presumption approach, controls adopted in the LTCP should be required to meet one of the following criteria:

- No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year;

- The elimination or the capture for treatment of no less than 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or
- The elimination or removal of no less than the mass of the pollutants identified as causing water quality impairment through the sewer system characterization, monitoring, and modeling effort for the volumes that would be captured for treatment above.

An LTCP that meets the criteria listed above is presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA, provided the permitting authority determines such a presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring and modeling of the system and consideration of sensitive areas (II.C.4.a of the CSO Control Policy).

The Policy also offers that a "...permittee may demonstrate that a selected control program, though not meeting the criteria of the [presumption approach] is adequate to meet the water quality-based requirement of the CWA..." This approach is referred to as the demonstration approach. The demonstration approach assumes that adequate data will be developed to reasonably demonstrate that implementation of the LTCP will provide for attainment of water quality standards.

In selecting the demonstration approach, a community would have several options for developing an LTCP that will be sufficient to meet applicable water quality standards. A community could, for example, develop an LTCP that would provide for attainment of currently-applicable water quality standards, or it could use a total maximum daily load (TMDL) to demonstrate that water quality standards can be attained through a combination of CSO controls and other controls. This document describes a third alternative: Working with water quality standards and NPDES authorities to integrate water quality standards reviews and revisions, as appropriate, with the development of a CSO control program that supports the attainment of water quality standards without causing substantial and widespread economic and social impacts.

The CSO Control Policy identifies four criteria for successful use of the demonstration approach. An LTCP based on the "demonstration approach" should show that:

- The CSO control program will protect water quality standards unless the standard cannot be met as a result of natural conditions or other pollution sources;
- The overflows remaining after implementation of the control program will not prevent the attainment of water quality standards;
- The planned control program will achieve the maximum pollution reduction benefits reasonably attainable; and
- The planned control program is designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet water quality standards, including protection of designated uses.

Where water quality standards cannot be met because of other pollution sources, a TMDL or other watershed-based tool should be used to determine and apportion pollutant loads.

Regardless of whether the presumption or demonstration approach is used, the CSO control program ultimately selected must be sufficient to meet water quality standards and other CWA requirements. The CSO community should undertake a post-construction water quality assessment program of monitoring and collecting sufficient data to demonstrate compliance with water quality standards, including protection of designated uses.

E. How do CSO LTCP monitoring and modeling activities support water quality standards reviews?

One objective of integrating CSO control planning and water quality standards reviews is for CSO communities to help collect information and conduct analyses, whenever possible, which will support both processes. Early involvement of state and EPA water quality standards and monitoring personnel in developing and reviewing the monitoring plans helps CSO communities collect the data and conduct the analyses to support the requisites of both CSO control planning and water quality standards reviews.

Many CSO communities focus monitoring and modeling activities primarily on the dynamics of the combined sewer system (frequency, duration, flow rate and volume of CSO discharges). Communities interested in pursuing water quality standards reviews will need to collect sufficient information to quantify the impacts of CSOs on the receiving water. EPA's *Combined Sewer Overflows - Guidance for Monitoring and Modeling* (EPA 832-B-99-002) provides information on developing a comprehensive monitoring and modeling plan that focuses both on the dynamics of the combined sewer system and the water quality impacts of CSOs.

CSO monitoring programs include both CSO effluent and ambient in-stream monitoring and, where appropriate, biological assessments, toxicity testing and sediment sampling to evaluate the effect of overflows on ambient water quality and the designated uses. These analyses also help to identify the water quality benefits of control alternatives, and to project the effect of remaining overflows on water quality standards attainment (See Table 1). Ideally, CSO monitoring programs should enable the community to:

- Assess attainment of water quality standards (including designated uses);
- Define the baseline conditions in the receiving water (chemical, biological, and physical parameters).
- Assess the relative impact of CSOs.
- Gain sufficient understanding of the receiving water to support the evaluation of proposed CSO control alternatives, including any receiving water modeling that may be needed.
- Support the review and revision, as appropriate, of water quality standards.

EPA recognizes that in practice, many CSO communities may face resource constraints that limit their ability to conduct comprehensive monitoring programs without collaboration from states and other stakeholders (including other municipalities) discharging to the affected water body. The monitoring parameters identified in the CSO Control Policy include "oxygen demanding pollutants, nutrients, toxic pollutants, sediment contaminants, pathogens, bacteriological indicators (e.g., enterococci, *E. coli*) and toxicity." This information characterizes CSO discharges and their water quality impacts, and is used to evaluate whether any of the CSO control plan alternatives will be sufficient to meet water quality standards. States use these evaluations to determine if water quality standards revisions may be appropriate, or if more extensive CSO controls are needed. It is important for the permittee, state, and EPA to agree on the information and analyses that are necessary to support both the CSO control plan and the review of water quality standards. The data needed to revise water quality standards are similar to the data needed to assess the attainment of water quality standards.

Table 1 - Types of CSO Data Supporting Water Quality Standards Reviews

- Timing of CSO events and their impacts on primary contact recreational periods or fish spawning.
- Average amount of precipitation causing a CSO event.
- Average time between CSO events.
- Season during which CSOs tend to occur more frequently.
- Estimate of the number, frequency, and duration of CSO events per year.
- Flow data for CSO-impacted waters.
- Appropriate meteorological, soils, land use and watershed modeling data.
- Identification of the designated uses.
- Use impairment data, including the severity and geographic extent of impairment (e.g. frequency and duration of beach closures).
- Location of sensitive areas relative to CSO outfalls (e.g., swimming areas, shellfish beds, fish spawning areas, drinking water supply intakes).
- Severity, extent, duration, and frequency of water quality criteria excursions.
- Pollutants in CSOs that cause or contribute to water quality criteria excursions (e.g., bacteria, BOD, nutrients, toxics).
- Pollutant loadings from other point sources (storm water, NPDES-permitted facilities), and from non-point sources (agricultural lands, roadways, and forestry operations).
- The cost versus performance of CSO control options.
- The financial impact of CSO control options.

Collaborative monitoring through consortiums is a cost-effective way to stretch monitoring resources, improve coordination or share expertise and the cost of data collection and management.[5] Many community organizations also support data collection with volunteer monitoring programs. Volunteer monitoring data can have a high degree of credibility, particularly where quality assurance and quality control procedures are documented.[6]

Involving community organizations in evaluating and comparing data on the operation, maintenance and replacement costs of CSO control alternatives over different time frames can help communities select the most cost-effective control alternative. Broad participation can also help these organizations better understand the scientific, technical and financial issues involved in the control of CSOs and other stressors that impair urban waters. By sharing solid information freely, community organizations can promote consensus on CSO control options and recommend complementary environmental enhancements that maximize improvements in the CSO-receiving water and provide greater environmental benefits to the watershed as a whole. With this understanding, these groups can facilitate communication with the larger community and generate support for CSO controls and their funding.

2. Water Quality Standards Program Framework

A. Who is responsible for water quality standards?

The CWA gives the responsibility for developing, adopting and reviewing water quality standards directly to states, territories, and authorized tribes. EPA reviews and approves or disapproves new or revised state water quality standards. After May 30, 2000, a water quality standard may be used for Clean Water Act purposes, such as for TMDLs and for NPDES permits, only after EPA approves the standard.[7] Under section 303(c)(4) of the CWA, EPA promulgates federal water quality standards when:

- EPA has disapproved a new or revised standard because the state has failed to adopt water quality standards consistent with the CWA and implementing regulations; or
- The Administrator makes a determination that a new or revised standard is necessary to meet the requirements of the CWA.

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[5] See U.S. EPA. 1997. *Monitoring Consortiums: A Cost-Effective Means To Enhance Data Collection And Analysis* (EPA 841-R-97-006).

[6] The *Directory of Volunteer Monitoring Programs* shows that 89 percent of those registering use documented quality assurance and quality control procedures following state- or EPA-approved plans. EPA has published *The Volunteer Monitor's Guide to Quality Assurance Project Plans* (EPA 841-B-96-003) and organizations such as River Watch provide technical guidance (see http://www.riverwatch.org/Catalog).

[7] 65 FR 24641, April 27, 2000.

B. How does a state develop and adopt water quality standards?

Under existing EPA regulations and guidance, states have considerable discretion in adopting water quality standards for a water body.[8] Water quality standards programs are different in each state, reflecting the diversity in climate, hydrology, and ecological conditions across the country.

Under section 303(c)(2), the CWA requires states to adopt water quality standards that will:

- Protect the public health or welfare;
- Enhance and maintain the quality of water; and
- Serve the purposes of the CWA.

The goal of CWA section 101(a)(2), which guides the water quality standards program, is to provide, "wherever attainable. . .water quality. . .for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water. . ." Under section 303(c)(2)(A) of the CWA, states are directed to establish their standards, taking into consideration the use and value of the water body for:

- Public water supplies,
- Propagation of fish, shellfish, and wildlife, and
- Recreation in and on the water.

In designating uses for a water body and adopting criteria to protect those designated uses, states consider the attainability of those uses, often weighing the environmental, social and economic consequences of their decisions. States adopt a suite of criteria necessary to protect the most sensitive of the designated uses and an antidegradation policy and implementation procedures to protect water quality.

EPA's water quality standards regulations limit state discretion when adopting and revising uses.[9] For example, states may not adopt waste transport as a use for a water body. Further, when designating uses and adopting applicable criteria, states must ensure the protection of downstream water quality standards (see 40 CFR 131.10(b)). In revising designated uses (discussed in more depth below), states may not remove an existing use or remove a designated use if it can be attained with the technology-based controls under sections 301(b) and 306 of the CWA and by implementing cost-effective and reasonable best management practices for nonpoint source control (see 40 CFR 131.10(h)(2)).

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[8] 40 CFR Part 131.

[9] 40 CFR 131.10.

C. How do states classify their uses?

State-designated use classification systems fall into two general types: "categorical" and "qualitative." The "categorical" approach uses categories that focus primarily on specific CWA uses (see Table 2).

Table 2 - Categorical Uses	
1	Domestic Water Supply
2	Industrial Water Supply
3	Fish and Aquatic Life
4	Recreation
5	Irrigation
6	Livestock Watering and Wildlife
7	Navigation

For example, a state may have the classification system at the left. These uses reflect the basic uses specified in the CWA. Any specific water body will likely have more than one use assigned to it (e.g., Green River - Uses 1, 3, 4, 6). For this state, there is only one aquatic life and recreation designated use, no subcategories are specified, and the uses do not imply qualitative judgments.

The "qualitative" approach, on the other hand, provides uses generally ranked in a qualitative manner, as in Table 3. The use classes clearly provide a qualitative judgment of the expected water quality, and a selection of "categorical" uses are included in the "characteristic use" section. Only one designated use (either AA, A, or B) is assigned to any specific water body.

Table 3 - Qualitative Uses		
Class AA - Remarkable	Water quality in this class shall markedly and uniformly exceed the requirements for all or substantially all uses.	Characteristic uses shall include . . .
Class A - Excellent	Water quality in this class shall meet or exceed the requirements for all or substantially all uses.	Characteristic uses shall include . . .
Class B - Good	Water quality in this class shall meet the requirements for all or substantially all uses.	Characteristic uses shall include . . .

States have developed a wide range of combinations of these two basic approaches and have refined these basic approaches, especially for aquatic life uses.

D. How do states protect recreational uses, particularly in urban areas?

States generally try to protect and maintain the recreational uses of their waters wherever possible, consistent with the "swimmable" goal of the CWA. Some states adopt primary contact recreation uses (e.g., swimming and some types of boating, such as kayaking) for all state waters. Others evaluate site-specific factors such as actual use, existing water quality, potential for water quality improvement, access, recreational facilities, location, safety considerations, and physical attributes of the water body (depth, width, substrate, safety, etc.). Physical attributes of the water body may be considered, but no single physical factor can be the only basis for

deciding that primary contact recreation is not appropriate. Swimming may occur unless access is precluded, for example by fences or locked gates, particularly in areas where children may not have other swimming opportunities. In addition, children will splash and swim in shallow waters that may otherwise be considered too shallow for full body immersion by adults.

Where primary contact recreational use of the water body does not occur during the winter, EPA's water quality standards regulation at 40 CFR 131.10(f) allows states to adopt a seasonal recreation use. A seasonal use defines the recreational season, such as April through October, applies the water quality criteria associated with the primary contact recreation use during that season, and applies less stringent water quality criteria during other months. When people are not using the water for recreation, states may adopt a less stringent water quality criteria to protect for incidental ingestion. These criteria are based on EPA's recommendation for secondary contact waters (i.e. not to exceed a geometric mean five times EPA's recommended water quality criterion for primary contact recreation). These less stringent criteria may be applied as long as they do not impair the use during the recreational season.

For water bodies where a state has demonstrated through a UAA that primary contact recreation is not feasible, is not feasible all the time, or poses public safety risks, the state has several options, depending on site-specific circumstances. For example, a state could adopt a CSO subcategory of recreational uses. Since the subcategory lowers the level of protection for the water body, EPA regulations at 40 CFR 131.10(j) require a UAA. Such a subcategory allows for a use less protective than swimming every day during the recreational season when a CSO LTCP that ensures attainment of the use at all times would cause substantial and widespread economic and social impact. How long the recreational use should be suspended and what other water quality criteria will apply during these events should be decided on a case-by-case basis. Such determinations should consider factors such as the proximity of outfalls to sensitive areas, the amount of rainfall, and time of year.

To ensure public safety when the recreational use is suspended, EPA expects municipalities to notify the public and prevent the public, wherever possible, from using the water body for recreation. One of the NMC under the CSO Control Policy is public notification of overflows. Recreational use should be suspended for periods when bacterial levels are elevated, which is usually longer than the storm or runoff event causing the overflow. As with any change in water quality standards, states must ensure that water quality standards of downstream waters are not impaired. As noted, any change to water quality standards must be submitted to EPA for approval or disapproval.

Some states adopt secondary contact activities, i.e., those activities where participants have little direct contact with the water and where ingestion of water is unlikely. Examples of secondary contact activities include canoeing, motor boating, and fishing. If the state adopts secondary contact recreation, but with primary contact bacteriological criteria, EPA does not require a UAA. EPA's policy is that any secondary contact criterion adopted by a state should be appropriate for the anticipated use and not exceed a geometric mean five times EPA's

recommended water quality criteria for primary contact recreation. Applying a less stringent criterion to a water body where only "secondary contact" activities occur should result in no greater risk of gastrointestinal illness than do water bodies designated with primary contact recreation.

E. What are the appropriate criteria for protecting primary contact recreation?

EPA strongly recommends that states adopt *Ambient Water Quality Criteria for Bacteria -1986* to protect public health when waters are used for primary contact recreation. The criteria indicators are *E. coli* or enterococci for fresh water, and enterococci for marine water. Table 4 lists the criteria. EPA stresses the need for states to adopt the 1986 criteria because epidemiological studies show that *E. coli* and enterococci are better indicators of gastrointestinal illness than fecal coliform. Twelve of the 34 states with CSO communities have adopted the 1986 criteria.[10] For coastal and Great Lakes states, the Beaches Environmental Assessment and Coastal Health Act of 2000 (PL 106-284, October 10, 2000) requires adoption of the 1986 water quality criteria for bacteria within 42 months of enactment (April, 2004), or EPA will promulgate, if necessary.

EPA recommends that for a water body to be judged fully supportive of its primary contact recreation use, the geometric mean of the samples taken should not exceed the criterion, and the single sample maximum should be met. Some have misinterpreted the water quality criteria as requiring a minimum number of samples in order to determine the attainment of the numeric water quality criteria. This may be due to the recommendation that a geometric mean be based on five samples taken over a 30-day period. The minimum number of samples used in the 1986 water quality criteria for bacteria is for accuracy purposes only; clearly, more frequent sampling yields more accurate results when determining the geometric mean. It is the geometric mean of the samples collected in conjunction with a single sample maximum that determines attainment of the numeric water quality criteria, regardless of the number collected.

To assure water quality criteria for bacteria are generally protective in all circumstances, EPA recommends:

- Frequent monitoring of known bathing areas to determine if the water body is attaining the water quality criteria.
- Conservative use of mixing zones for bacteria where mixing zones are authorized.
- Prohibiting mixing zones from impacting known primary contact recreation areas.
- Using the appropriate single sample maximum in the assessment of primary contact recreation.
- Conducting a sanitary survey when higher than normal levels of bacteria are measured.

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[10] States with CSO communities using enterococci for marine waters and enterococci/E.coli for fresh water include: CA, CT, DE, IN, ME, MI, NH, NJ, OH, OR, TN, VT.

A sanitary survey is an examination of a watershed to detect unauthorized sanitary discharges from sources such as:

- Failed septic tank leach fields or cesspools.
- Sewage leakage from broken pipes.
- Sanitary sewer overflows from hydraulically overloaded sewers.
- Overflows from storm sewers that may contain illegal sanitary sewer connections.

In addition, EPA recommends that sanitary surveys identify other possible sources of fecal pollution, including confined animal areas, wildlife watering points, and recreational spots, such as dog running/walking areas. EPA is developing the data to publish additional health-based water quality criteria to protect for other non-gastrointestinal health risks, such as skin and respiratory infections.

In both fresh and marine waters, excess nutrients, along with the warm water temperature of recreational waters, provide an ideal growth medium for potentially harmful pathogens. High levels of indigenous *Aeromonous hydrophila* can infect cuts and scratches, and high levels of *Vibrio parahenolyticus* or *Vibrio vulnificus* contaminate shellfish with life-threatening consequences for vulnerable individuals. In addition to controlling nutrients for recreational waters based on aesthetics (e.g., weeds, algal scums, and low transparency), greater levels of nutrient control for more sensitive aquatic species should also provide a greater level of protection for public health.

TABLE 4
Summary of EPA-Recommended Water Quality Criteria For Bacteria[11]

	Steady State, 30-day Geometric Mean Indicator Density (cfu/100mL)	Single Sample Maximum (cfu/100mL)			
		Designated Beach Area	Moderate Full Body Contact Recreation	Lightly Used Full Body Contact Recreation	Infrequently Used Full Body Contact Recreation
Freshwater					
enterococci	33	61	89	108	151
E. coli	126	235	298	406	576
Marine Water					
enterococci	35	104	124	276	500

[11] *Ambient Water Quality Criteria for Bacteria–1986*, EPA 440/5-84-002

Thus far, EPA has published *Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs* (EPA-822-B00-001) and *Nutrient Criteria Technical Guidance Manual: Rivers and Streams* (EPA-822-B-00-002). The Agency plans to publish *Nutrient Criteria Technical Guidance Manual: Estuarine and Coastal Waters* during the Fall 2001. The general guidelines in the Technical Guidance Manuals provide information states can use as they develop nutrient criteria to protect various designated uses, such as water supply, aesthetic qualities of recreation, and different types of aquatic species. Although health-based recreational guidelines are not included in the document, EPA believes that if the current criteria protect sensitive aquatic species, the criteria should also protect public health.

F. Where are the bacteria criteria applied?

Many states apply the ambient water quality criteria for bacteria directly to the discharge ("end-of-pipe") rather than at the point of contact where recreational uses actually occur. CSO outfalls may be sufficiently removed from recreational areas so as not to pose a public health threat. With a supporting UAA, states could also segment a water body to protect the recreation in the area where it is most likely to occur and prohibit recreation in other areas of the water body where CSOs and other discharges pose significant public health threats.

G. How do states protect aquatic life uses?

Some states use a single designated use (e.g., fish and aquatic life), some use simple subcategories (e.g., warm water fishery, cold water fishery), and some use qualitative class (e.g., Class A). These generic aquatic life use designations, either categorical or a qualitative, do not recognize the natural biological variations that occur among water bodies (swift flowing small streams, large meandering rivers, lakes, wetlands, estuaries, etc.) or climatic conditions, altitude, geology, soils, land use, or hydrologic conditions found in different ecological regions. Different ecological regions have natural variations in biologically healthy aquatic life, as measured by indices of species richness, diversity, composition, and condition of the aquatic habitat which can flourish in any particular water body. More precise definitions of the type of aquatic life to be protected give municipalities and the public a better understanding of the species to be protected and the level of control needed. Some examples of more precise use definitions are trout and salmon or blue gill; crappy and large mouth bass; and self-supporting fishery; stocked fishery; or critical life stages of species.

In order to help better define and protect different aquatic communities, EPA and the states continue to develop biological assessment tools and criteria to more accurately describe the natural range of aquatic communities. Once additional natural aquatic communities are defined, EPA recommends that states refine their designated uses to reflect natural differences.

H. How have some states developed more refined aquatic life uses?

Several states have refined their aquatic life uses to reflect different biological systems within their borders. Most states (at least, those with cold water fish) have use categories for warm water and cold water fish. Some states have refined these classes further by focusing on the fish populations, as in Table 5:

Table 5 - Aquatic Life Use Classes

Class 3 -- Protected for use by aquatic wildlife.	
Class 3A	Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
Class 3B	Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
Class 3C	Protected for non-game fish and other aquatic life, including the necessary aquatic organisms in their food chain.
Class 3D	Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

Other states have developed subcategories based on physical characteristics and/or ecological systems, as in Table 6:

Table 6 - Water Body Classifications

Classification of state waters.
(a) State waters are classified as either inland waters or marine waters.
(b) Inland waters.
  (1) All inland waters are either fresh waters, brackish waters, or saline waters;
  (2) All inland fresh waters are classified as follows, based on their physical characteristics, ecological systems, and other natural criteria:
    (A) Streams (perennial or intermittent);
    (B) Springs and seeps, natural lakes, and reservoirs;
    (C) Elevated wetlands;
    (D) Low wetlands;
  (3) All inland waters which are brackish waters or saline waters are classified as follows, based on their physical characteristics, ecological systems, and other natural criteria:
    (A) Coastal wetlands;
    (B) Estuaries;
    (C) Anchialine pools; and
    (D) Saline lakes
(c) Marine waters . . .

I. Why are refined aquatic life uses important in the urban environment?

EPA believes that urban watersheds can and do support aquatic life and that improvement and restoration of healthy urban aquatic communities is, in many cases, an attainable goal of the CWA. States, with EPA's support, are developing biological assessment tools and biological criteria to assess the health of their waters in relationship to the "biological integrity" goal of the CWA. Biological integrity for a particular water body is the natural (or minimally impacted) condition of the water body.

There are a number of water quality and non-water quality factors that affect the attainment of natural aquatic communities in urban areas, including the amount of impervious surface, human activity resulting in permitted and non-permitted discharges, and the type and extent of hydrologic modifications. Some recent literature suggests the full restoration of natural aquatic life communities may not be feasible in small watersheds with heavily urbanized areas. Schueler found significant impairment of aquatic life where levels of impervious cover in urban areas were in the range of 8-percent to 20-percent.[12] Yoder *et al.* found this threshold level is also influenced by other factors such as pollutant loadings, watershed development history,

[12] Schueler, T. R. 1994. The importance of imperviousness. *Watershed Protection Techniques* 1:100-111.

riparian buffers, CSOs, and types of land use.[13] More sensitive aquatic life, such as brook trout, may be unable to survive in watersheds with as little as 1- to 2-percent impervious land cover.[14] However, states that base their aquatic life use classification systems on biological criteria and on a range of use subcategories which lead to the appropriate aquatic life goal for a water body, have a framework for evaluating attainability of improvements in urban aquatic life ecosystems.

EPA recognizes the need for additional guidance to better define the factors to consider in designating and protecting appropriate aquatic life uses in urban areas. Such guidance would address a variety of urban stressors that might prevent attainment of an otherwise expected aquatic community, cover a broad range of geographic areas, and consider the full range of imperviousness in urban areas. This guidance would help states adopt subcategories of aquatic life uses and water quality criteria that more accurately and precisely define actual and attainable aquatic communities. Once this information is developed, states, watershed organizations, and local communities will be able to identify the recovery potential of the aquatic communities, adopt appropriate water quality standards, and design affordable restoration and protection strategies.

J. What steps are necessary to develop a system of tiered aquatic life uses and subcategories for urban systems?

A two-step process is outlined below in Table 7. First, the state defines the biological communities for various water body types in areas with minimal human impacts (Column A) based on EPA bioassessment/biocriteria methodologies.[15] Second, the state defines reasonably attainable biological communities for the urban-impacted areas (Column B). Once a refined designated use system is developed, individual water bodies may be assigned refined designated uses, as appropriate.

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[13] Yoder, C. O., et.al. 1999. Assessing the status of aquatic life designated uses in urban and suburban watersheds, pp.16-28. *In* Everson, A., *et al.* National Conference on Retrofit Opportunities for Water Resource Protection in Urban Environments, Chicago, Il. EPA-625-R-99-002.

[14] Maryland Biological Stream Survey, http://www.dnr.state.md.us/streams.mbss/brook.html

[15] *Biological Criteria: National Program Guidance for Surface Waters*. 1990. EPA-440/5-90-004.
- *Biological Criteria: Technical Guidance for Streams and Small Rivers, Revised Edition.* 1996. EPA 822-B-96-001.
- *Draft Estuarine And Coastal Marine Waters Bioassessment and Biocriteria Technical Guidance.* 1997. EPA 822-B-97-001.
- *Lake and Reservoir Bioassessment and Biocriteria: Technical Guidance Document.* 1998. EPA 841-B-98-007.
- *Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish.* Second Edition. 1999. EPA 841-B-99-002.

K. What is the process for assigning subcategories of uses to individual water bodies?

Revision of use classification systems requires a revision to state water quality standards subject to EPA review and approval or disapproval, as outlined in EPA's water quality standards regulations. EPA's water quality standards regulations require states to use a UAA to develop an appropriate scientific, technical or economic justification for the change when reclassifying waters with a less protective use than the current designated use.

The new designated use must be equal to or better than the "existing" use.[16] No UAA is required if the state adopts a new designated use that is either equivalent to the reference condition for that particular water body type or meets the "fishable/swimmable" goal of the CWA and the state adopts criteria equal to, or more stringent than the current designated use. Under the EPA's water quality standards regulations, a combination of a new use subcategory with less stringent criteria would trigger a UAA.[17]

[16] Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards (40 CFR 131.3). See also 40 CFR 131.10(g).

[17] 40 CFR 131.6(b) and 131.10(j)(2).

Table 7 - Developing A Refined Aquatic Life Designated Use System		
	Column A	**Column B**
Step	For refined use designations reflecting the range of natural biological communities in the area . . .	In addition, qualitative subcategories reflecting achievable biological communities in urban-impacted areas . . .
1	Develop bioassessments able to differentiate between the natural biological communities in the different water body types.	Refine bioassessment protocols to differentiate between the range of urban impacts (e.g., imperviousness, land use type (industrial, residential, etc), development history, hydrologic modification) in the different water body types of concern.
2	Conduct bioassessments of the different water body types to collect data reflecting non-impacted waters (reference condition).	Conduct bioassessments to capture the biological impacts from a range of urban conditions.
3	Refine the aquatic life designated use categories to reflect the natural biological communities within each water body type (e.g., lakes/impoundments, small streams, rivers, estuaries, wetlands).	Determine the achievable biological condition for the range of urban impacts. Develop qualitative subcategories for each designated use based on achievable biological conditions (e.g., based on percent imperviousness, land use).
4	Develop biological criteria that protect the natural community (reference condition) for each designated use category.	Develop biological criteria that reflect the attainable biological community for each qualitative subcategory.
5	In establishing each designated use applied to a water body type, determine the range of allowable difference from the reference condition that meets the "fishable" goal of the CWA.	For each urban impacted subcategory, determine if its biological criteria fall within the range of allowable difference from reference condition and meet the "fishable" goal of the CWA
6	Adopt refined designated use categories, biological criteria defining those uses, and protective chemical and physical water quality criteria into water quality standards.	Adopt subcategories, biological criteria defining those subcategories, and protective chemical and physical water quality criteria into water quality standards.

The supporting information for aquatic life use refinements in a use classification system (whether or not a formal UAA has been performed) should address:

- Does the refined designated use and its description of the aquatic community (biocriteria) reflect the reference condition (i.e., natural state) for the kinds of waters to which the new classification is to be applied?
- If newly proposed water quality criteria are necessary to protect the use, are they scientifically defensible?

Even if a UAA is not required, these are important questions for the state to address. EPA regulations at 40 CFR 131.10(c) allow states to adopt categories of a use and set appropriate criteria to protect varying needs of the use. When refining the aquatic life use categories, the

state needs to explain how the proposed biological description correctly reflects the aquatic life use potential for that water body.

For example, one state adopted a "Limited Resource Water" subcategory of aquatic life use. This subcategory is described as "waters that have been the subject of a use attainability analysis and have been found to lack the potential for any resemblence of any other aquatic life habitat as determined by the biological criteria . . . The use attainability analysis must demonstrate that the extant fauna is substantially degraded and that the potential for recovery of the fauna to the level characteristic of any other aquatic life habitat is realistically precluded due to natural background conditions or irretrievable human-induced conditions." The state assigns less stringent water quality criteria to Limited Resource Waters. One of the causative factors associated with Limited Resource Waters is:

> "small drainageway maintenance - these are highly modified surface water drainageways (usually less than three square miles in drainage area) that do not posses the stream morphology and habitat characteristics necessary to support any other aquatic life habitat use. The potential for habitat improvements must be precluded due to regular stream channel maintenance required for drainage purposes."

Another state adopted a subcategory of aquatic life use called "Limited Warmwater Fishery." This use class has less stringent dissolved criteria oxygen that apply from May through November. In addition, chronic aquatic life criteria for Limited Warmwater Fishery are implemented using a stream design flow statistic with a more frequent return interval (7Q2 instead of a 7Q10). This is another example of a refined aquatic life use subcategory that a state adopted and EPA approved. As with the first example, any stream assigned a Limited Warmwater Fishery use has a supporting UAA.

III. REVIEWING AND REVISING WATER QUALITY STANDARDS

1. How often are water quality standards reviewed?

The CWA requires states to review their water quality standards at least once every three years. EPA expects that the recent revisions to EPA's water quality standards regulations ("Alaska Rule," 65 FR 24641, April 27, 2000) will result in states submitting more frequent revisions to their standards, because any new or revised standards cannot be used for CWA purposes until EPA approves them. The extent to which this occurs depends in part on state authorizing statutes, regulatory requirements, and administrative procedures. Some states have more lengthy processes, particularly where the legislature enacts water quality standards into state law before the new or revised standards are submitted to EPA, or where an independent board adopts the standards revised by the state agency responsible for the water quality standards program. Limited resources may be another constraint.

Where CSO communities collect the information outlined in this document and follow the process for developing their draft LTCPs (as shown in Figure 1) and coordinate with State Water Directors throughout the planning and implementation processes, states will have a stronger basis on which to conduct timely water quality standards reviews. State water quality standards reviews could result in identification of information needed to support water quality standards actions, such as:

- Time-limited variances.
- Water quality standards revisions.
- No revisions to the water quality standards.

2. What type of water quality standards revisions are possible?

State water quality standards reviews may include any element of the standard including uses, criteria, the anti-degradation policy and other policies affecting the implementation of the water quality standards program, such as variances or compliance schedules. For example, a review of the suite of criteria to a particular water body may result in adding new criteria, revising criteria based on national guidance (e.g., adopting *E. coli* or enterococci) or setting a site-specific criterion, if appropriate. In addition, states may review implementation policies on where criteria are applied, e.g., applying the bacteria criteria at the point of contact rather than at the end-of-pipe. Another option may be segmenting the water body to preserve recreation in areas where it actually occurs.

To protect recreational uses as much as possible, some states are looking at creating subclasses of recreational uses that recognize intermittent exceedances of bacteriological criteria due to CSOs. This approach retains the recreational use, but lowers the level of protection for the use by specifying the maximum number of days when recreation can not safely take place. For example, the subcategory may state that during the recreation season, recreation can be

suspended up to a certain number of days. The number of allowable days that the use could be suspended would be based on a site-specific use attainability analysis (see 3. below). The analysis would project the number of days that bacteriological levels are likely to be elevated after implementing a well-designed and operated CSO control program that does not cause substantial and widespread economic and social impact. Before lowering the level of protection for a use, states must provide an opportunity for the public to review the proposal and analyses justifying the revision (see 40 CFR 131.20(b)). States must also ensure that any revision provides for the attainment and maintenance of downstream water quality standards (see 40 CFR 131.10(b)).

States may not remove:

- An "existing" use, i.e., a use actually attained in the water body on or after November 28, 1975 (see 40 CFR 131.3(e) and 131.10(h)(1)); or
- A use that can be attained by the imposition of effluent limits required under sections 301(b) or 306 of the CWA and cost-effective and reasonable best management practices for non-point source control (see 40 CFR 131.10(d) and 131.10(h)(2)).

3. What type of analysis is required to remove or lower the level of protection for a use?

EPA's water quality standards regulation at 40 CFR 131.10(j) requires a use attainability analysis (UAA) whenever a state fails to adopt a use designation, or changes the use designation with the effect of removing or lowering the level of protection for the protection and propagation of fish, shellfish and wildlife, or for the protection of recreation in and on the water. Once a use is designated, it cannot be modified unless the state demonstrates through a UAA that attaining it is not feasible.

A UAA is a structured scientific assessment of the physical, chemical, biological and economic factors affecting the attainment of the use. Included in the regulation are six bases that address circumstances which may preclude the attainment of the use. A description of how and when designated uses may be removed is presented in Appendix II. Any one of the following factors can be used to justify changes in the designated use:

1. Naturally occurring pollutant concentrations prevent the attainment of the use.
2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the uses, unless these conditions may be compensated with sufficient effluent discharges.
3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more damage than to leave in place.
4. Dams, diversions or other types of hydrological modifications preclude the use, and it is not possible to restore the water body or operate the modification in such a way that would result in attainment.

5. Physical conditions related to the natural features of the water body unrelated to water quality preclude attainment of aquatic life uses.
6. Controls necessary to attain the use would cause substantial and widespread economic and social impact.

The UAA must provide sufficient information for the state to determine that the designated use is not attainable and also provide the basis for adopting an alternative use and the criteria to protect that use. To support the 101(a) "fishable/swimmable" goal uses, the state should adopt an attainable alternative use as close as possible to the goal uses. As noted, the public must also have an opportunity to review the UAA and the alternative use before the state submits the revisions and the UAA to EPA for approval or disapproval.

Guidance is available on conducting UAAs (Appendix III). Although most of this guidance addresses aquatic life uses and the economic analyses, several EPA Regional Offices have developed guidelines for recreational use UAAs. Appendix IV contains a recreational UAA discussion.

4. What bases may be appropriate for determining that a use is not attainable in CSO receiving waters?

EPA recognizes that even in the absence of CSO discharges, attainable restoration goals for some urban systems may not be the same as those attainable for non-urban systems. Urban waters may have permanently altered uses due to modified flow regimes, contaminated sediments, changes to in-stream or riparian habitat, or other types of "human-caused conditions or sources of pollution that cannot be remedied" or "would cause more environmental damage to correct than to leave in place" (40 CFR 131.10(g)(3)). Although controlling CSOs generally does have a beneficial effect on aquatic life and recreation, some of these alterations may persist independent of CSO controls. In determining the attainable use, the state will need to evaluate the extent to which the factors contributing to the impairment can be restored.

Physical alterations in the urban environment often preclude full attainment of uses due to limited access, channelization, and hydraulic impairments that pose logistical as well as safety constraints for swimmers, waders, fisherman, and boaters. Examples of such alterations include modifications for shipping channels and certain types of flood control projects. Physical alterations may justify the need for a review and possible revision of applicable water quality standards when developing LTCPs.

Revisions to water quality standards based on CSO discharges however, are most likely when the controls necessary to attain the standard would cause "substantial and widespread

economic and social impact."[18] The *Interim Economic Guidance For Water Quality Standards*[19] identifies the analyses states may use to support this determination for water pollution control projects, including CSO LTCPs. States may also use alternative analyses and criteria to support this determination, provided they explain the basis for these alternative analyses and/or criteria.

For the public sector, the Guidance includes the tools for water pollution control projects, including CSO LTCPs for states to evaluate:

- Who within the community would bear the costs of the CSO LTCP.
- Whether these costs are substantial.
- Whether changes in socioeconomic conditions indicate widespread impacts.

In determining whether the costs of the draft LTCP are substantial, the annualized per-household cost of sewer services, including existing and new costs, is divided by the median household income. If the result (termed a municipal affordability screener) is less than 1 percent, the state could decide that the annualized costs are minimal and that financial and economic impacts do not warrant revising the water quality standard on that basis. If the municipal affordability screener is between 1 and 2 percent (a mid-range impact) or greater than 2 percent (a large impact), additional analyses may be appropriate. These secondary analyses include evaluation of the following indicators:

- Bond rating.
- Overall net debt as a percent of the full market value of taxable property.
- Unemployment rate.
- Median household income.
- Property tax revenue as a percent of full market value of taxable property.
- Property tax collection rate.

The results of these secondary assessment scores are summarized as a cumulative secondary indicator (<1.5 minimal impact; 1.5 - 2.5 mid-range; and >2.5 strong). The state combines the municipal affordability screener and the secondary indicator in a matrix to help determine whether the impacts are "substantial."

The derivation of the 2 percent yardstick is based on EPA studies across environmental programs that collected financial information from communities around the country. The studies found that two cutoffs were appropriate for determining the difficulty the community would have in affording additional project costs. Based on the data across many federal and state programs, EPA found that affording an annual sewer bill of:

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[18]. 40 CFR 131.10(g)(6).

[19]. *Interim Economic Guidance For Water Quality Standards: Workbook* (EPA-823-B-95-002, March, 1995).

- Less than 1 percent of median household income per year may not be difficult for the consumer,
- Between 1 percent and 2 percent may be difficult for some consumers, but more information is needed.
- Greater than 2 percent may be difficult for the consumer.

If the impacts are found to be substantial, the state would also have to demonstrate that they are widespread before proposing a water quality standards revision. There are no explicit criteria on which to evaluate "widespread" impacts, although EPA recommends evaluating the change in the following indicators:

- Median household income
- Community unemployment rate
- Overall net debt as a percent of full market value of taxable property
- Percent of households below the property line
- Impact on community development potential
- Impact on property value.

The significance of the changes will help the state determine whether impacts are widespread. Therefore, EPA cannot identify an acceptable or unacceptable estimated change for each indicator.

If the state determines that the community cannot afford a level of CSO control to no longer interfere with the attainment of water quality standards, EPA policy allows states to revise their water quality standards based on the water quality improvements to be achieved by the maximum level of CSO control that would not cause substantial and widespread social and economic impacts on the community. This revision must be approved by EPA before it becomes effective for purposes of the CWA.

5. Are there ways to simplify the UAA process?

Simplifying the UAA process begins with an inclusive process. With an inclusive process a broad range of state, local and federal entities can actively participate in the scientific, technical and funding discussions related to the CSO LTCP. An inclusive CSO LTCP process simplifies the UAA process by broadening the cadre of knowledgeable individuals familiar with the CSO issues and the likelihood of identifying other opportunities for further water quality and use improvements with different types of CSO controls. These individuals increase the likelihood of identifying other watershed opportunities for further water quality and use improvements. They can also facilitate communication with the community-at-large by explaining why additional controls or water quality standards revisions are needed.

Common sense and good judgment play an important role in determining the amount of data and level of analyses needed to justify changes in the designated use. The UAA process is simplified when the CSO community, the state and EPA agree in advance on the scope of the UAA, the data to be collected, and the analyses to be conducted.

The amount of data to be collected and analyses to be conducted will depend on the particular water body. Some are inexpensive. Others are more difficult, such as examining the effect of continued CSOs on a productive estuary. For the process to work smoothly, everyone needs to agree on:

- Study design and objectives
- Data to be used and the methods and procedures to collect it
- Analyses to be conducted
- Critical factors to be used in interpreting the results.

Another way to simplify the UAA process is for the state to tailor the UAA to the factor most likely precluding the attainment of the use. A less rigorous UAA would be needed for a particular aquatic life use when the physical features of the water body prevent attainment. Where physical features are the limiting factor for a particular aquatic life use, there may be no need to conduct extensive water quality analyses. In CSO-impacted waters, where pathogens are often the limiting factor in attaining recreational uses, there may be no need to conduct extensive biological monitoring.

The UAA is also simplified where existing data are available. For example, a state that has a biologically-based, refined classification system for aquatic life protection might have generated extensive biological monitoring data to support the classification system. The data would include numerical values or procedures for calculating numerical values applicable to a particular type of aquatic life. Because they have data and an agreed-to basis for interpreting those data, UAAs will be easier for states with such scientifically-based aquatic life use classification systems. EPA continues to encourage states to adopt a biologically-based refined aquatic life use protection classification system.

Another way to simplify the UAA process is to follow examples of UAAs that have been used to support water quality standards revisions or that have shown a use to be attainable. Some states have an outline of the data and analyses needed. They also provide examples of UAAs that have been used to support water quality standards revisions. Following state outlines and examples and other general models in the guidance documents should provide a good starting point.

Additionally, “generic” assumptions could be developed if groups of water bodies share similar characteristics. However, every water body and combined sewer system is different, and additional data will be needed to demonstrate that the generic assumptions are applicable to the circumstances of a particular water body. Such generic assumptions might relate to:

- Physical, chemical and biological characteristics of the water body,
- Existing and designated uses,
- Hydraulic characteristics of the combined sewer system,
- Number and volume of the overflows,
- Response of the system to different types of storm events,
- Type of controls to be implemented.

6. What is a variance and when is it appropriate?

A variance is a time-limited change in the water quality standards, typically of three- to five-year duration, with renewals possible. Variances that extend longer than three years need to be reviewed triennially to confirm their continuing appropriateness. Variances provide a "bridge" if additional data or analyses are needed before the state can make a determination that the designated use is not attainable and adopts an alternative use. When a state (or EPA) adopts the variance, it must have sufficient data to determine that the designated use is not attainable within the duration of the variance. Because a variance is a change in the water quality standard, the same requirements apply for a variance as for a new or revised standard, e.g., public review and comment, and EPA approval or disapproval.

When adopting a variance for an individual discharger for specific pollutants, such as bacteria, states have to demonstrate that the designated use is not an existing use (40 CFR 131.10(h)(1)) and that the designated use is not attainable with the technology-based controls in sections 301(b) and 306 of the CWA and with cost effective and reasonable best management practices for nonpoint sources (40 CFR 131.10(h)(2)).

To preserve existing uses, and ensure progress toward the ultimate attainment of the designated use, conditions in a variance are set as close as possible to those for the designated use, and always retained at the level needed to preserve the existing use. Other pollutant limits or discharger effluent limits are not affected by a variance. For example, a state may adopt a bacteria variance for specific CSO outfalls, but other point source dischargers would have to continue to comply with the bacteria limits in their permits.

Because the underlying designated use remains (and because the variance will ultimately lapse), the rigor of the analyses and the level of demonstration used for a variance are generally less than that required for a permanent change in the use. States still need to demonstrate, however, that at least one of the six bases for a change in a use apply *at least during the variance period*. EPA expects that sufficient information will be available in a draft LTCP to justify a variance.

In approving a variance, EPA looks at the conditions the state has included in the variance (e.g., implementation of portions of the CSO LTCP and water quality monitoring). Further environmental progress can be attained when variances include provisions such as:

- Prohibition on further degradation of water quality or further impairment of the designated use.
- Permit requirement for implementing high priority CSO controls (e.g., eliminating, treating or directing overflows from sensitive areas).
- Collection of additional monitoring data.
- Analyses that address complex questions related to determining an attainable goal for the water body.
- Evaluation of whether further environmental benefits could be attained in the water body or watershed by supplementing CSO controls with other environmentally beneficial projects linked to the CSO receiving water body.

Once the agreed-to portion of the LTCP is implemented and the effect on water quality is evaluated, the state will be better able to judge whether the use can be attained with additional controls, or it needs to revise the water quality standards. Given the extended duration that EPA anticipates for implementation of many LTCPs, longer term variances for specific pollutants associated with particular CSO outfalls similarly may be warranted, based on the demonstrations described above, subject to triennial review to determine continuing appropriateness.

IV. INTEGRATING CSO LTCP DEVELOPMENT AND IMPLEMENTATION WITH WATER QUALITY STANDARDS REVIEWS

1. How do you integrate the development of CSO LTCPs by communities and the review of water quality standards by states?

EPA believes that communities and states can integrate the development of affordable, well-designed and operated CSO control programs, implementation of high-priority controls, and water quality standards reviews. One purpose of the CSO Control Policy is "to coordinate the planning, selection, design and implementation of CSO management practices and controls to meet the requirements of the CWA and to involve the public fully during the decision making process." The Policy also includes four key principles, one of which is the "review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs."

Given the above principle and the importance of early and frequent coordination among municipalities, State Water Directors, NPDES authorities, if different,[20] and the public, this guidance lays out a process (Figure 1) that is intended to ensure that all key groups engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate water quality standards. The process can be used by municipalities that are developing or are implementing their LTCPs, or by municipalities that have implemented their LTCPs but find that remaining CSOs continue to impair the attainment of water quality standards. It is an iterative process as shown in Figure 1 and the accompanying narrative. The purpose and major objectives of the process and flow chart are to:

- Delineate clear roles and responsibilities for CSO communities, NPDES authorities, State Water Directors, EPA and others.
- Secure early agreement on the process and scope of the data and information needed to support an LTCP and a water quality standards review.
- Ensure early input of the public in the LTCP and water quality standards review processes.
- Ensure the acceptance of a draft LTCP is closely coordinated with decisions on water quality standards revisions, if appropriate.
- Ensure the final LTCP and the water quality standards are reconciled.

Further, efficient use of resources can be realized through incorporating certain guidelines into the process early. Some of these suggested guidelines include the following, and should be considered before starting the process outlined in Figure 1:

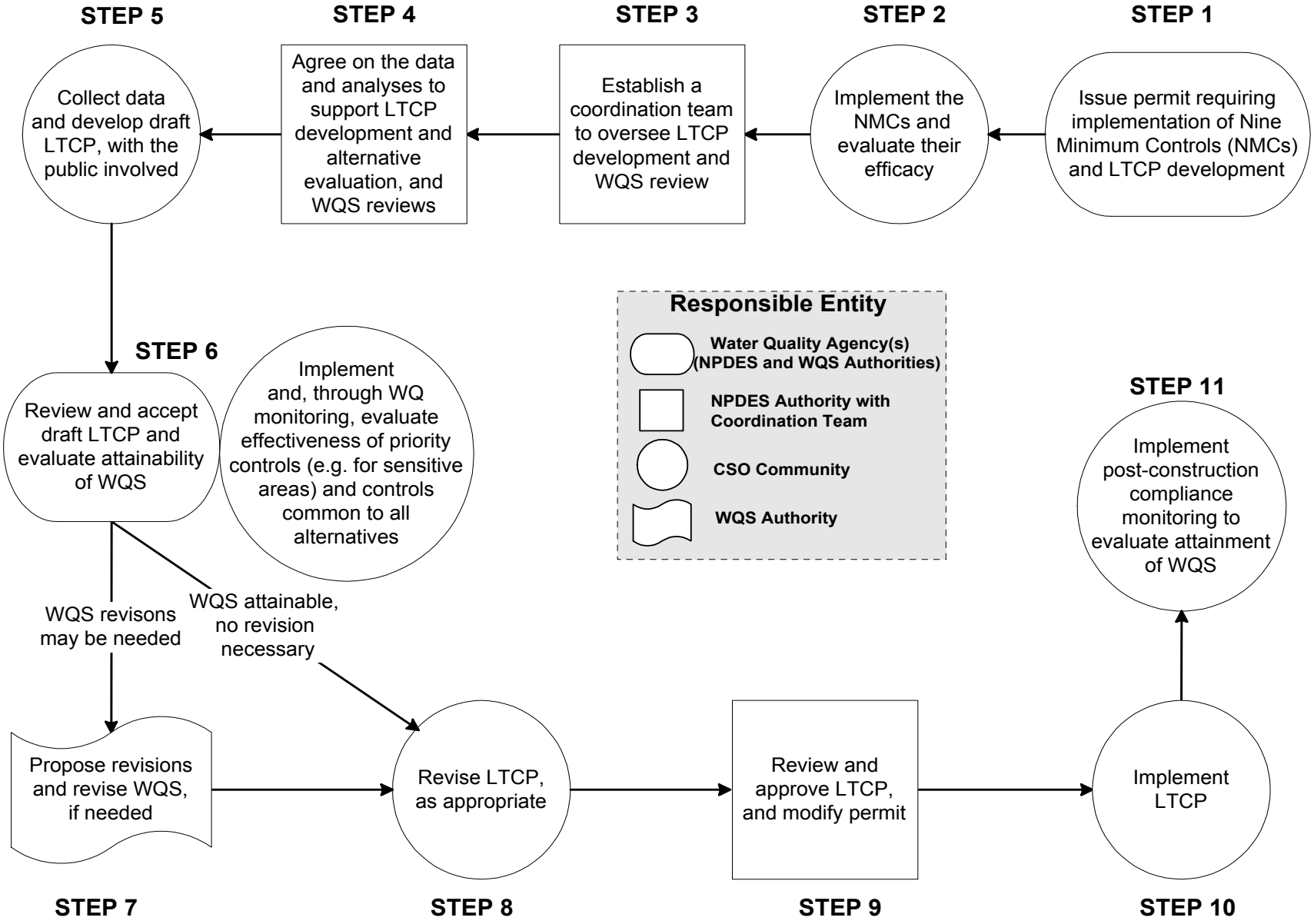
[20] NPDES authorities may be authorized States, or EPA Regional Offices, or federally recognized tribes.

- Close coordination between state permitting and water quality standards programs to identify priority water bodies for CSO control and evaluate the existing uses and the applicability of current standards.
- Identification of ongoing or planned TMDL activities for CSO-impacted waters, to promote synergy in data collection and water body assessment.
- Formation of the coordination team, which should include a review of Figure 1 to ensure that the appropriate entities plan to be fully involved when needed, because not everyone is needed at every point in the process.

The flow chart in Figure 1 lays out a series of steps that provide greater assurance that affordable, well-designed and operated LTCPs support the attainment of appropriate water quality standards. Figure 1 is intended to expand upon and explain, but not replace, the process described in the *Combined Sewer Overflows - Guidance for Long-Term Control Plan* (EPA 832-B-95-002).

EPA recognizes that the integration of the LTCP and water quality standards processes requires a substantial commitment from CSO communities, states, and EPA. However, by agreeing on priorities and a schedule for water quality standards reviews, state water quality standards and NPDES authorities and EPA can make efficient use of their resources and assure their full participation at key points in the process.

FIGURE 1 - Coordination of LTCP Development and Water Quality Standards Review and Revision



Step 1 - Issue permit requiring implementation of the NMC and LTCP development. The NPDES authority issues a permit or other enforceable mechanism that requires the CSO community to implement the NMC and develop an LTCP. The permit or enforceable order will require that the CSO community immediately proceed with the implementation of the NMC.

Step 2 - Implement the NMC and evaluate their efficacy. The CSO community should evaluate the efficacy of the NMC in controlling the number and quality of the overflows. One of the goals of the CSO Policy is to achieve an early level of CSO control, even as the municipality is involved in developing the LTCP. Following an assessment of NMC effectiveness, municipalities should ultimately integrate the NMC into their LTCPs.

Step 3 - Establish a coordination team to oversee LTCP development and WQS review. The NPDES authority organizes a team to coordinate the development of a draft LTCP. The coordination team will promote timely discussion of issues, identify sources of information, and provide technical assistance. The coordination team should include decision-making representatives from the CSO community, NPDES authority, and State Water Director . It may also be helpful to include a representative from EPA at this point because if a water quality revision becomes necessary, the revision will need to be reviewed and approved by EPA. The coordination team may also include representatives from local community stakeholders, including those involved in watershed planning efforts, other point sources, nonpoint source representatives, and persons involved in TMDL development, if applicable.

This process requires significant coordination and cooperation and full participation by the communityand state (and if needed EPA). State Water Directors and their NPDES and water quality standards entities will need to set priorities among CSO communities and the affected water bodies. The state should coordinate the schedule for developing a TMDL with the schedule (in the permit, administrative order or judicial order) for developing the CSO LTCP before deciding on the schedule for the water quality standards review. Priorities might include:

- A court ordered TMDL analysis is underway on a receiving water where the NPDES authority has approved the CSO LTCP, or the municipality (or separately permitted municipal dischargers located along the same river reach) has developed sufficient information to determine that:
  - The use is not attainable based on a water body survey and assessment including the factors in 40 CFR 131.10(g)(1)-(5), or
  - The level of CSO control required to attain or no longer interfere with the attainment of water quality standards would cause substantial and widespread economic and social impact.
- A municipality (or separately permitted municipal dischargers located along the same river reach) has implemented the approved CSO LTCP and has collected post-construction monitoring data showing that the remaining overflows contribute to exceedances of water quality standards.

- A municipality (or separately permitted municipal dischargers located along the same river reach) has received approval of its CSO LTCP that contains sufficient information to justify state adoption of a variance that would allow time to gather further information, either on the efficacy of the controls in meeting water quality standards, or on the attainability of the recreational use.

State authorities in the NPDES and water quality standards programs need to actively participate in the coordination team where particular controversy exists, and EPA participation may be necessary where there are interstate issues on a common body of water. Once the review is scheduled, states and EPA can phase their active participation among communities and water bodies, depending on the community's progress.

Some states and EPA Regional Offices have successfully used "kick off" or periodic meetings with CSO communities to respond to common issues or questions. Communities have also expanded their own coordination efforts beyond their local constituency groups by involving downstream communities affected by overflows, and other state and EPA personnel.

A community that is currently implementing an approved LTCP may request that the state review the water quality standards for CSO receiving waters. A community could also request that the NPDES authority form a coordination team to assist the water quality standards authority in evaluating the attainability of the standards.

Step 4 - Agree on the data and analyses to support LTCP development and alternative evaluation, and water quality standards review. The objective of this step is to ensure that there is early agreement on the planned process (i.e., key milestones and dates) and scope of the LTCP (e.g., presumption or demonstration approach), including the data and analyses needed to support selection of control alternatives and review of water quality standards.

The members of the coordination team should agree on:

- The amount and type of data needed (i.e., characterization, monitoring and modeling of the sewer system and its impacts on the receiving water body; data needed for post construction compliance monitoring to be included in the community's monitoring and modeling plan[21]).
- The range of alternative control levels to be evaluated, including cost and performance information for each alternative examined.
- Relevant sensitive areas.
- A timetable for completion of key events.

[21] *Combined Sewer Overflows - Guidance For Monitoring and Modeling*. (EPA 832-B-002, January, 1999).

Together, the CSO community and the coordination team review historical data and information on the combined sewer system and receiving water quality to develop a profile of conditions, identify additional information to collect, and agree on the components of the monitoring and modeling plan. The monitoring and modeling plan needs to:

- Support a thorough evaluation of the combined sewer system.
- Characterize the response of the system to various precipitation events.
- Determine the efficacy of the NMC.
- Determine the characteristics of the CSO effluent, and the effect of overflows on ambient water quality.
- Describe post-construction compliance monitoring.

The monitoring and modeling plan identifies the parameters of concern in the receiving water and water quality standards. In many cases, the principal concern will be pathogens. Biological assessment, toxicity testing and sediment sampling may also be included in the plan, where appropriate. All appropriate entities should reach agreement with the community on the monitoring and modeling plan needed to support both the draft LTCP and the water quality standards review. At a minimum, the NPDES authority, State Water Director and the community are critical to securing this agreement. Coordination during this step provides greater certainty that ultimately, the NPDES authority will approve the LTCP. Data collection efforts should also be coordinated with any planned or on-going TMDL.

The coordination team should seek to optimize the development and analysis of the information on CSO impacts in a manner that will support the water quality standards review and the evaluation of the improvements in water quality during the implementation of the controls. The amount and type of data will depend on the nature and extent of the site-specific CSO impacts and the availability of data. The LTCP can serve as the foundation for a water quality standards review.

The common components of an LTCP and a water quality standards review include:

- Water quality monitoring and modeling.
- Hydraulic monitoring and modeling.
- Detailed descriptions of existing and designated uses.
- Analyses of the potential for use attainment.
- Analyses of control costs.

The objective of this step is for the coordination team to agree on the additional data and analyses and the critical factors to be used in interpreting the information; the schedule for the studies; and the list of participating parties – before the community, state, EPA, or other federal agency (e.g., U.S. Geological Survey) initiates any of the studies. Integrating water quality standards reviews with the development and implementation of an affordable level of CSO control necessitates that all parties agree in advance on the information and analyses that are

appropriate to support a water quality standards revision that can be adopted, consistent with the CWA and EPA's implementing regulation at 40 CFR 131.10. Agreement on the data needed for the LTCP will support the collection of information needed for a UAA to the greatest extent possible.

EPA regulations at 40 CFR 131.10(j) require a UAA whenever the state proposes to reduce the level of protection for the water body. If the State Water Director agrees that a UAA is appropriate, UAA guidance is available (Appendix III). Appendix IV discusses recreational UAAs.

EPA regulations at 40 CFR 131.10(i) also require that if the water body supports a use with more stringent water quality requirements than the designated use, the state must revise the use on that water body to reflect the use that is being attained. States are not required to conduct UAAs when adopting more stringent criteria for a water body.

The state is responsible for making the determination, based on a UAA, that a use is attainable, or that another appropriate attainable use needs to be adopted. EPA expects that the UAA will be based in large part on data collected as part of the LTCP process, recognizing that the data collection for the LTCP should be designed to support a UAA if ultimately needed. The State Water Director should agree on the amount and type of data needed, taking into consideration the nature and extent of the site-specific CSO impacts when making this judgment.

As discussed previously, before states can adopt a use that lowers the level of protection for a water body, they must:

- Document that the current water quality standards are not attainable based on any one of the factors in 40 CFR 131.10(g)(1)-(6).
- Provide an opportunity for the public to review the proposal and analyses justifying the revision (40 CFR 131.20(b)).
- Ensure that any revision provides for the attainment and maintenance of downstream water quality standards (40 CFR 131.10(b)).

In addition, states may not lower the level of protection for or remove:

- An "existing" use, i.e., a use actually attained in the water body on or after November 28, 1975 (40 CFR 131.3(e) and 131.10(h)(1)): or
- A use that can be attained by the imposition of effluent limits required under section 301(b) or 306 of the CWA and cost-effective and reasonable best management practices for non-point source control (40 CFR 131.10(d) and 131.10(h)(2)).

Step 5 - Collect data and develop draft LTCP, with the public involved. With agreement on the scope of the LTCP and the data collection and analyses, the CSO community implements the monitoring and modeling plan and develops a draft LTCP.

In order to design a CSO control plan adequate to meet the requirements of the CWA, the CSO community should have a thorough understanding of its sewer system, the overflows, and the water quality impacts that result from CSOs. Monitoring and modeling should be used to adequately characterize the system for a range of storm events. The characterization should show the response of the sewer system to wet weather events, including the number, location and frequency of CSOs, volume, concentration and mass of pollutants discharged and the impacts of the CSOs on the receiving waters and their designated uses. The monitoring and modeling data will be used to evaluate the expected effectiveness of the NMC and LTCP in meeting water quality standards.

For each CSO control level examined, the CSO community evaluates the constructability, costs, performance, water quality benefits, and protection of sensitive areas. The CSO community also identifies other sources of pollution impacting the CSO receiving water which may preclude the attainment of water quality standards, regardless of the level of CSO control. At a minimum, the CSO community considers the following levels of control:

- Levels of control that would be necessary to achieve the following average number of overflow events:
- -- Zero overflow events (e.g., 100 percent capture for treatment), eliminating the contribution of CSOs to water quality standards violations.
  - One to three overflow events per year
  - Four to seven overflow events per year,
  - Eight to twelve overflow events per year
- Treating or directing CSOs away from sensitive areas.

Alternatively, the CSO community could evaluate controls to achieve varying levels of capture rather than limiting the number of overflow events in its LTCP. In this case, the alternative control levels should include various percentages of the wet weather flow volume entering the combined sewer system during wet weather under average annual conditions (e.g., 100 percent, 95 percent, 90 percent, 85 percent, 80 percent, 75 percent of the combined sewage collected in the combined sewer system during wet weather events).

Communities often hold workshops during the development of the draft LTCP to identify priorities for controls and control alternatives to examine. Workshops on the LTCP, combined with discussion of the analyses needed to support a water quality standards review, can promote coordination and inform the public about the effect of various levels of CSO control on the use of the water body and the attainment of water quality standards. Such workshops can also promote a timely dialogue among the CSO community, the public, the state, and EPA about additional control alternatives and appropriate water quality standards revisions. Information on the water

quality standards program should be available to support workshop discussions.[22] Prior to accepting the LTCP, states may require communities to hold a public hearing, take comment on the LTCP, and show how the comments were addressed.

The LTCP should include a financing plan that identifies sources of capital funds. The CSO Control Policy recognizes that financial capability is a significant factor in establishing implementation schedules for CSO controls and therefore, if necessary, allows a phased implementation schedule that is prioritized based on the relative importance of adverse impacts upon water quality standards, including designated uses. Where implementation of CSO controls causes financial burden, construction may be phased in over an extended period of time. Typically, schedules are negotiated by the CSO community and its NPDES authority.

The CSO community submits the draft LTCP, including the data and analyses assessing the attainability of current water quality standards, to both the NPDES authority and to the State Water Director. In moving from Step 5 to Step 6, coordination between the NPDES authority and water quality standards authority becomes paramount. Up-front planning is likely to be necessary to ensure that the analysis and decisions made by the two entities are synchronized.

Step 6 - Review and accept draft LTCP and evaluate the attainability of water quality standards; implement and, through water quality monitoring, evaluate effectiveness of priority controls (e.g., for sensitive areas) and controls common to all alternatives. The State Water Director and the NPDES authority (if different) need to review the draft LTCP. The CSO community needs to work with the regulatory agency to confirm that the basis of the LTCP is acceptable, e.g., the data, the alternatives examined, and the schedule for implementing controls common to all alternatives examined. If the draft LTCP is insufficient, the NPDES authority returns the draft to the community for revision.

Concurrently, if sufficient data are available, the State Water Director evaluates the attainability of the applicable water quality standards. Coordination between the NPDES authority and the water quality standards authority is essential in this step. At a minimum, this assessment will include the factors discussed in Section III.3 and Appendix IV.

The data collected and analyses conducted by the CSO community may be sufficient to justify a water quality standards revision, or may show that a water quality standards revision is not justified. If the state agrees that the data and analyses support a water quality standard revision (recognizing the revision may produce more or less stringent standards), this would represent a commitment from the state to proceed with proposing water quality standards revisions.

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[22]. Elder, D., G. Killam and P. Koberstein, Chapter 4, Water Quality Standards and the Public's Role, in *The Clean Water Act: An Owner's Manual*. River Network, Portland, OR, 1998; U.S. EPA, Introduction to Water Quality Standards (EPA-823-F-99-020, October, 1999; U.S. EPA, Developing Criteria To Protect Our Nation's Waters (EPA-823-F-98-002, April, 1998).

If the data and analyses show that currently applicable water quality standards can be attained, and that revisions to the water quality standards are not justified, the state notifies the community and the coordination team. The NPDES authority then works with the community to revise the LTCP, as described in Step 8.

If sufficient data are not available to evaluate the attainability of the use, the State Water Director, in consultation with the coordination team, identifies the parameters for which additional information is needed. If the community wishes to pursue a water quality standards review, these additional data should be collected while implementation of the LTCP is initiated.

In accordance with the CSO Control Policy, municipalities should identify all sensitive water bodies and the CSO outfalls that discharge to them as part of developing the LTCP. According to the CSO Control Policy, sensitive areas include:

- Outstanding National Resource Waters
- National Marine Sanctuaries
- Water with threatened or endangered species or their designated critical habitat
- Primary contact recreation waters, such as bathing beaches
- Public drinking water intakes or their designated protection areas
- Shellfish beds

Municipalities may also identify other areas for special protection.

As soon as the state review of the LTCP has been completed and priority controls accepted, EPA expects that municipalities will begin to implement these priority controls, such as treating or re-directing CSOs which impact sensitive areas. The NPDES authority may need to revise or reissue the NPDES permit or other enforceable mechanism (e.g., administrative or judicial order) requiring the implementation of these "priority controls." In addition, the permit or other enforceable mechanism would include the requirements contained in a variance, if adopted by the state, and monitoring to be conducted to evaluate the efficacy of the controls in reducing overflows and improving water quality. This information could cause the community to re-think planned controls, based on the water quality improvements already achieved.

Step 7 - Propose revisions and revise WQS, if needed. To reach this step, the CSO community, NPDES authority, and State Water Director should have agreed that the LTCP contains adequate data and information to support the selection of CSO controls and identify needed revisions to the water quality standards. The state should proceed as expeditiously as possible to propose and adopt these revisions, taking into consideration public comment, including those of EPA before adopting final revisions.

Once the community has implemented priority CSO controls, the state may determine that a water body has the potential to support improved aquatic life. Under this circumstance, the state would upgrade the aquatic life use for the water body. In other cases, the state may

determine that the recreational uses are not fully attained all the time, and may refine the recreational uses to reflect the maximum level of control from a well-designed and operated control program that does not cause substantial and widespread economic and social impact. As discussed in Step 4, other revisions applicable to recreation may include:

- Applying the standard at the point of contact rather than at the end-of-pipe.
- Creating subclasses of the current designated use to recognize intermittent exceedances of bacteriological criteria.
- Segmenting the water body to preserve the designated use in areas where it actually occurs.

Prior to submitting a proposed water quality standard revision to EPA for review, EPA's water quality standards regulations require the state to hold a public hearing and request comment on the proposed revisions. This public hearing is an opportunity for the CSO community to be actively involved and to help explain the proposed CSO control alternatives and their relationship to the proposed water quality standards revision. This hearing also affords the public an opportunity to have input on the selection of the final CSO program at a key decision point, given the LTCP's relationship to the attainment of water quality standards.

EPA's water quality standards regulations at 40 CFR 131.21(b) require that any analyses, including the UAA, used in support of the water quality standard revision be made available for public review and comment at the time the revisions are proposed. Subsequent to public review and comment and appropriate revision, the state submits the revision, supporting analyses and public comments to EPA for review.

Before the revisions in the water quality standards may be used for CWA programs, including TMDLs and NPDES permits, EPA must approve the state-adopted water quality standards revision (see 65 FR 24641, April 27, 2000). Again, where there has been close coordination and cooperation, the approval process is more likely to proceed expeditiously. EPA is expected to approve a state's new or revised standard within 60 days, or disapprove within 90 days.

Step 8 - Revise LTCP, as appropriate. If the water quality standards decisions differ from those that the CSO community anticipated, or if the previously implemented controls have not performed as predicted, the community would have to revise the draft LTCP.

The CSO community should work closely with the regulatory authorities to confirm the project implementation schedule for the CSO control program. Key milestones include, for example, design completion, attainment of funding, construction milestones, completion dates, and implementation of post-construction monitoring. Guidance on these issues is available in *Combined Sewer Overflows - Guidance for Long-Term Control Plan.*

Step 9 - Review and approve LTCP, and modify permit. The NPDES authority coordinates the review of the revisions and, if appropriate, approves the final LTCP, which provides that CSO discharges do not contribute to excursions of water quality standards or non-compliance with other CWA requirements. The NPDES authority issues a permit or administrative order, or proceeds with revisions to an enforceable order requiring implementation of the approved LTCP.

Step 10 - Implement the LTCP. The CSO community implements the control measures described in the approved LTCP and required in its NPDES permit or other enforceable mechanism. The LTCP includes an operational plan and a post-construction compliance monitoring program to ensure continued compliance with the requirements of the CWA.

Step 11 - Implement post-construction compliance monitoring to evaluate attainment of water quality standards. In addition to proposing a CSO control strategy, the LTCP outlines the post-construction operational plan and compliance monitoring activities that the community will undertake to assure that the controls function as planned. Post-construction compliance monitoring is necessary to verify that any remaining CSOs do not contribute to excursions of water quality standards or non-compliance with other requirements of the CWA.

Both during and after construction of the CSO controls described in either Step 6 or Step 10, the community collects and analyzes collection system and receiving water data, as appropriate, to assess whether the controls function as planned. If, after implementing the controls outlined in the LTCP, the CSO community finds that it is still contributing to the non-attainment of the applicable water quality standards, it will use the monitoring data and return to Step 6 to consider revising the LTCP. Revisions may include changes to operating plans or the operation and maintenance schedules, or development of expanded or additional controls, which may be retrofitted to existing controls. The municipality may also request that the water quality standards authority review and revise the standard based on the results of a use attainability analysis, including a finding that additional controls would cause substantial and widespread economic and social impact.

2. How have states reconciled their water quality standards with overflows remaining after a well-designed CSO LTCP has been developed?

By using the flexibility in their water quality standards program framework, a few states have the mechanisms in place for integrating water quality standards reviews with the development and implementation of a well-designed and operated CSO control program.

One approach EPA recommends is to use continuous simulation modeling and volumetric stream flow to develop TMDLs, waste load allocations, and water quality-based permit limits, and to support UAAs as appropriate. This approach takes into account episodic events, integrating wet weather variables such as storms (frequency, duration and intensity), surface runoff, and land-use patterns. Daily flow data are available on about 6,200 stream reaches with U.S. Geological Survey gaging stations, and estimated flows can be calculated where measured

values are unavailable. Guidance is available through BASINS (Better Assessment Science Integrating Point and Nonpoint Sources), which integrates a geographic information system (GIS), national watershed data, and environmental assessment and modeling tools into a single assessment tool (see www.epa.gov/ost/basins).

The State of Oregon allows the discharge of untreated domestic waste, with exceptions, based on a storm event greater than the one-in-five-year 24-hour duration storm in the winter, and greater than the one-in-ten-year 24-hour duration storm in summer. This only applies where the state has approved a basin- or geographic-specific bacteria control management plan that:

- Identifies the specific hydrologic conditions under which the numeric criteria would be waived.
- Identifies the public notification and education processes to inform the public about an event and the plan.
- Describes the water quality assessment conducted to determine the bacteria sources and loads associated with the specified hydrologic conditions.
- Describes the bacteria control program that is being implemented in the basin or specified geographic area.

The State of Washington addresses remaining overflows by allowing, on average, a once-per-year exemption to several parts of its mixing zone policy. The exemption waives provisions related to the maximum size of the mixing zone, the applicable acute criteria, and to the overlapping mixing zone criteria. However, the state does not waive the mixing zone policy provision that prohibits the mixing zone from contributing to a loss of sensitive or important habitat, substantially interfering with the existing uses of the water body, damaging the ecosystem, or adversely affecting public health.

Another approach used by Massachusetts and Maine is to subdivide their uses into CSO subclasses. Based on a UAA, and under specified circumstances, Massachusetts temporarily suspends the primary contact recreational use and the bacteria criteria during CSO events. Maine uses the same type of temporary suspension, but also suspends shell fishing. Although these states developed and will implement their approaches differently, the approaches have a great deal in common. For example, both states:

- Maximize the protection of sensitive use areas.
- Require state-approved well-designed control programs (in Massachusetts, controls must meet the recreational goal use 95 percent of the time; Maine suspends uses for the shortest duration practicable, in the smallest area possible, and where the public impacts are minimal).
- Call for UAAs consistent with the requirements in 40 CFR 131.10.
- Use variances when they don't know whether the designated uses can be fully attained, and require additional water quality data collection before deciding that the use is not attainable.

- Make implementation of CSO controls a condition for the community eligibility to use the criteria and temporary use suspension.
- Review progress periodically.

Some states are also considering adopting a high-flow cutoff into their water quality standards that suspends bacteria criteria and thus, the recreational uses, under certain defined conditions of high wet weather flows in the receiving water. The concept of a flow cutoff for extremely high flows or dangerous velocities may have merit. However, cutoff proposals need to be based on rigorous scientific assessment and must reflect public input. Additionally, such a cutoff should be applied on a case-by-case basis (rather than state-wide, for example), tailored to the water body (rivers, as distinct from lakes), and set high enough to only be applicable under certain limited conditions. Water body flow and velocity vary greatly, depending on a combination of many factors, such as the amount of impervious surface, slope, soil texture, vegetative cover, soil compaction, soil moisture, etc. The conditions affecting velocity also vary with the depth and width of the water body's channel. If a state adopts a flow cutoff, several questions need to be answered:

- Will the cutoff protect the other uses?
- What is the resulting velocity?
- Would the velocity preclude all recreational uses (including kayaking) that typically occur during high velocity flows?
- Do the high flows have a minimal effect on the velocity of the flow, posing little or no danger to persons using the waters for recreation?
- For how many days would the cutoff apply?
- Will the state adopt the cutoff statewide, create a discharger-specific variance, or develop recreational subcategories that correlate to the cutoff?
- Has a UAA shown that an affordable well-designed and operated control program could not achieve a higher level of CSO control than that afforded by the cutoff?
- What effect would the high flow cutoff have on implementing controls for other sources of bacterial contamination to the water body (e.g., storm water, leaking septic systems, feed lots, row crops, etc)?

EPA has not developed a national policy on a high flow/velocity cutoff for bacteria and recreational uses, similar to the low flow cutoff for aquatic life criteria. Guidance implementing such a policy should include scientifically valid methodologies for maintaining and protecting the section 101(a)(2) recreational uses when normal flow returns, and for protecting downstream uses. EPA envisions a methodology that states could apply on a site-specific basis using the water body channel and landscape characteristics. States could also create a subcategory of the recreational uses to which the cutoff would apply. Since use of a high flow/velocity cutoff reduces the level of protection for the water body, a UAA would be required for its application to a specific water body. It would be particularly important to demonstrate that a community could not afford a higher level of control (or, for example, additional storm water or agricultural BMPs). As with other changes in designated uses, the public must have an opportunity to

comment on the proposed revision to the water quality standard before a state adopts and submits it to EPA for approval or disapproval.

3. How will EPA ensure that NPDES authorities and State Water Directors participate in the review and revisions, as appropriate, of water quality standards for CSO-receiving waters?

EPA will work with states and NPDES authorities to require that all permits, orders, and decrees conform with the CSO Control Policy as provided for in Section 402(q)(1) of the CWA. To ensure the availability of accurate and timely data concerning permitting actions and other CSO program actions described in the Policy, EPA will establish a database tracking system for CSO permit requirements and water quality standards reviews.

V. THE WATERSHED APPROACH

EPA recognizes that urban water quality may be affected by a combination of CSOs, storm water, other point source discharges, and nonpoint source runoff. These sources may be addressed most effectively through TMDL analyses or other watershed-based management plans. Congress also recognized the importance of the watershed approach in section 402(q) of the CWA by authorizing "wet weather watershed pilot projects."

1. What is EPA's overall approach to watershed-based planning?

EPA encourages the use of a watershed approach to prioritize actions to achieve environmental improvements, promote pollution prevention, and meet other important community goals. Watersheds provide a natural framework around which to manage water quality improvement and protection programs. CSO planning on a watershed basis allows a community to assess the full range of sources (including other wet weather sources such as storm water) and ensure that investments yield the greatest environmental benefit. Sound scientific analyses, including TMDLs that address both the point and the non-point sources of the pollutants impairing the water body, support the watershed approach. The watershed approach is an inclusive, collaborative process that involves many diverse interests who use the data and information to define the goals, set priorities, and develop a suite of integrated controls that achieve the water quality goals for the water body.

Under a watershed approach, local stakeholders coordinate the development of a comprehensive watershed plan that provides for collection of environmentally relevant data and serves as the basis for identifying appropriate regulatory and non-regulatory actions to be implemented to improve water quality. A watershed approach does not provide any additional liability protection or change the legal status of discharges to waters of the United States. Watershed plans can be considered, however, when developing enforcement schedules for bringing unauthorized discharges into compliance with the CWA.

A watershed approach to controlling CSOs and other wet weather discharges has the potential to: improve the basis for water quality management decisions; provide an equitable and cost-effective allocation of responsibility among dischargers; and, in so doing, deliver the same or greater levels of environmental improvement sooner and at a cost savings. A watershed approach emphasizes the role of CSO communities and other local stakeholders in identifying water quality priorities, and increases the opportunity for using risk-based approaches to environmental protection.

A. What information sources are available on watershed approaches?

Several EPA documents explain the principles of watershed-based water quality planning. EPA's *NPDES Watershed Strategy* (March, 1994) outlines national objectives and implementation activities for integrating NPDES program functions into a broad watershed

approach and provides support for development of state-wide basin management approaches. *The Watershed Framework* (May, 1996) describes EPA's expectations for state and tribal implementation of watershed approaches. The 1998 *Clean Water Action Plan* has, at its core, an emphasis on local watershed planning. It calls upon state, federal, and local agencies, watershed-based organizations, and the public to identify watersheds most in need of restoration and to cooperate in the development of watershed restoration action strategies and implementation of these strategies.

In addition, EPA lists many excellent publications and web-based resources for watershed groups on the Agency's web site at www.epa.gov/owow.

B. How does watershed planning relate to TMDL development?

A TMDL is a watershed plan, developed to attain a particular water quality standard. The watershed planning process and TMDL analyses generate valuable information on total pollutant loadings and the relative contribution of the pollutant sources. Since TMDLs must be developed to meet existing water quality standards, the permit (or other enforceable mechanism) for implementation of the LTCP also must provide for the attainment of water quality standards, including any revisions to the water quality standards made as a result of the TMDL or LTCP. Consequently, it is important that LTCPs be developed and implemented in explicit coordination with TMDL evaluations and other watershed management planning.

The TMDL considers seasonal variations and reasonably foreseeable increases in pollutant loads in allocating the reductions in pollutant loadings needed to attain and maintain water quality standards. Participation in watershed planning and support of state- or EPA-developed TMDLs may yield efficiencies for CSO communities. For example, using an existing watershed organization as the public advisory group for CSO control planning and implementation, the community gains knowledgeable individuals committed to finding solutions. By participating in watershed/TMDL analyses, a CSO community can help provide the information to support an equitable allocation of pollutant loading reductions among all point and nonpoint sources. This is particularly important where CSO receiving waters are affected by numerous sources, and a watershed-level effort is needed to allocate pollutant loadings. Where pollutant sources from different states contribute to the impairment of a shared water body or a downstream water body, states may need to involve EPA in the development of the TMDL in order to bring all jurisdictions into the planning process.

In urban areas, water quality may be impacted by many sources. These can include wastewater, storm water, and upstream point and non-point pollution sources. TMDL analyses may evaluate a number of different options to attain water quality standards, including:

- Eliminating or treating all CSOs.
- Imposing more stringent controls for leaking septic tanks, storm water discharges, or animal feeding operations.

- Developing stronger non-point source control programs.
- Revising the water quality standard for a particular pollutant and the applicable permit requirements.

Watershed planning and TMDL analyses can promote flexibility and innovation for addressing CSOs and other pollutant sources. The planning and analyses may identify more cost-effective allocation of pollutant reductions using a combination of BMPs and CSO controls which together yield greater environmental benefits than would CSO controls alone. Participants can identify complementary environmental projects, such as upstream storm water controls, along with nonstructural CSO controls, that may enhance the aquatic habitat and foster improvements in both recreation and aquatic life uses. Development of a TMDL may also support a UAA to review and revise water quality standards, as appropriate.

C. How does watershed planning affect capital planning?

EPA is exploring ways to support capital investments in combined and separate sanitary sewer collection systems that are consistent with and complementary to broader watershed planning objectives. Many municipalities are well positioned to coordinate with other watershed stakeholders in the development of LTCPs addressing needs and deficiencies in storm water and wastewater infrastructure. CSO communities may find it advantageous to take a leadership role in local watershed planning, particularly where CSOs and other urban wet weather discharges contribute heavily to water quality impacts or where a municipality has substantial data, resources, or incentive to take a leadership role.

D. Who sets the priorities for TMDLs?

States set the priorities for conducting a TMDL although in some cases litigation has resulted in a court setting the schedule. Therefore, the state should coordinate the schedule for the development of a TMDL with the schedule for deciding on any appropriate revisions to the water quality standards. This is particularly important where a court-ordered schedule directs that a TMDL be established prior to the state's water quality standards review. In this circumstance, a state-adopted variance may be especially appropriate.

2. How does CSO planning fit into a watershed approach?

The approach identified in Figure 1 for coordinating LTCP development and water quality standards review lends itself well to coordination with watershed stakeholders to address wet weather sources of pollution. The data collection, planning, and coordination activities identified in Figure 1 can be an integral part of a comprehensive watershed planning and implementation process, in which stakeholders identify water quality and environmental problems through a comprehensive watershed assessment. The process would involve coordination of the LTCP development process, the process for reviewing and (as appropriate)

revising water quality standards, and other programs to improve water quality in a more efficient and effective fashion.

The watershed planning process typically begins with identification of stakeholders who can contribute significantly to the implementation of coordinated periodic management activities, who are significantly impacted by water quality problems, who will need to undertake control measures because of legal or regulatory requirements, or who oversee their implementation. This process would include satellite municipalities whose collection systems significantly contribute to wet weather problems; owners of agricultural, industrial, or other pollutant sources outside the urban area that contribute to impairment; and members of the public. Where possible, the stakeholder identification process should be integrated with identification of the coordination team formed to oversee the LTCP and water quality standards processes (Step 3 of Figure 1).

Under this process, each regulated stakeholder would be required to implement appropriate minimum measures without delay. For example, the CSO community would be responsible for implementing the nine minimum controls required in Step 1 of Figure 1.

The parties to the watershed planning process would coordinate efforts to assess the sources of impairment in the watershed and the degree to which sources contribute to impairment. If the assessment indicates the need for pollution controls beyond minimum measures, the parties should agree on recommendations for allocation of water quality management responsibilities based on sources' relative contributions to impairment. This approach is reflected in Step 4 of Figure 1, where the CSO community, the coordination team, and other involved entities agree on the amount and types of data needed, development of a monitoring and modeling plan, and gathering of the essential data needed to support the draft LTCP and a draft UAA, where appropriate.

The watershed plan should identify recommendations for interim and final LTCP goals, including recommendations to NPDES authorities for establishing or adjusting enforceable requirements. Responsibilities for funding planning and remediation projects should be defined. When allowed under state law, and consistent with any applicable TMDL, the NPDES authority could agree to phase additional water quality regulatory requirements to accommodate the planning process and to synchronize requirements such as monitoring among participants. Special consideration would be warranted for sensitive and high-exposure areas such as beaches and drinking water supplies.

EPA expects that communities will implement high priority controls, such as eliminating or fully treating overflows to sensitive areas, while TMDLs or watershed plans are being developed. CSO control planning and phased implementation of the controls allows communities to implement their initial controls and evaluate the water quality improvements. They may be able to re-evaluate planned controls based on the water quality improvements already achieved. Watershed plans can be taken into account when developing enforcement

schedules for bringing unauthorized or unpermitted discharges into compliance with the CWA, but watershed plans (including the planning process) are not a bar to enforcement actions.

3. How do states with CSO communities use watershed approaches?

States with CSO communities can apply the watershed approach in different ways. Using the watershed as the basis for managing all state water quality programs (e.g., Delaware and Ohio) promotes logical scheduling. When data are collected on a rotating basis, they support several activities:

- Water quality standards reviews
- "303(d) list" development of non-attained waters
- TMDL analyses
- Permit issuance

Others use the watershed approach selectively for monitoring, designating uses, reviewing water quality standards, or issuing permits:

- Monitoring (Indiana)
- Use designations (Delaware River Basin Commission, Washington),
- Water quality standards reviews (Ohio), and
- Permit issuance (Georgia, Kentucky, Nebraska, West Virginia).

Watershed plans and TMDLs afford the opportunity to identify complementary projects that could save resources or gain additional environmental benefits for the community. Targeting CSO controls to eliminate overflows to parks or swimming areas may stimulate public improvement projects that yield greater environmental benefits and offset the costs of eliminating the overflows. Or, stream bank stabilization might improve aquatic life more than large storage facilities for combined sewers would have.

VI. CONCLUSION

EPA believes that communities and states can integrate water quality standards reviews with the development of an affordable, well-designed and operated CSO control program and implementation of priority controls. EPA expects that CSO communities will collect information on the efficacy of the controls in improving water quality. This information should be adequate to allow the community and the state to determine that the LTCP, when completed, prevents CSOs from causing or contributing to the non-attainment of applicable water quality standards and/or to assist the state in determining if the use is not attainable and in identifying another attainable use. Once reconciliation occurs, CSO communities and states will have carried out the water quality-based provisions in the CSO Control Policy.

APPENDIX I

ANNOTATED BIBLIOGRAPHY OF CSO GUIDANCE DOCUMENTS

Combined Sewer Overflows - Guidance for Long-Term Control Plan (EPA 832-B-95-002)

This guidance describes how municipalities can develop comprehensive long-term control plans that recognize the site-specific nature of CSOs and their impacts on receiving water bodies. The document describes how to develop a long-term control plan that includes technology-based and water quality-based control measures that are technically feasible, affordable, and consistent with the CSO Control Policy.

Combined Sewer Overflows - Guidance for Nine Minimum Controls (EPA 832-B-95-003)

This guidance provides information on nine minimum technology-based controls that communities are expected to use to address CSO problems, without extensive engineering studies or significant construction costs, before long-term measures are taken. Communities were expected to implement the nine minimum controls and submit documentation no later than January 1, 1997.

Combined Sewer Overflows - Guidance for Screening and Ranking (EPA 832-B-95-004)

This guidance presents a process for screening and ranking combined sewer systems to help permitting authorities establish CSO permitting priorities. May also help permittees rank their CSOs in order to best allocate their limited resources.

Combined Sewer Overflows - Guidance for Funding Options (EPA 832-B-95-007)

This guidance will help permittees as they develop CSO control funding plans. The guidance presents plain-English descriptions of a broad spectrum of options that may be available to fund the capital, debt service, and operational costs of CSO controls. It describes the benefits and limitations of various funding options.

Combined Sewer Overflows - Guidance for Permit Writers (EPA 832-B-95-008)

This guidance is intended primarily for NPDES permitting authorities and permit writers and describes how to develop and issue NPDES permits with CSO conditions that reflect the CSO Policy. It provides example permit language and stresses the need for coordination between permittees, permit writers, water quality standards authorities, enforcement authorities, and the public.

Combined Sewer Overflows - Guidance for Financial Capability Assessment and Schedule Development (EPA 832-B-97-004)

This guidance discusses how a community's financial capability and other factors identified in the CSO Policy may be used to negotiate reasonable compliance schedules for implementation of CSO controls. It presents a two-phase process for assessing financial capability, based on EPA's experience in the Construction Grants, State Revolving Fund, enforcement, and water quality standards programs. It stresses the need

for flexibility and evaluation of site-specific factors in the development of implementation schedules for CSO controls.

Combined Sewer Overflows - Guidance for Monitoring and Modeling (EPA 832-B-99-002)
This manual explains the role of monitoring and modeling in the development and implementation of a CSO control program. It expands discussions of monitoring and modeling introduced in the CSO Control Policy and presents examples of data collection and simulation of sanitary and storm water flows in the combined sewer system. To use this manual, a municipality should already be familiar with the basic functioning of its CSS, basic monitoring procedures, and the general purpose of modeling.

The guidance documents are available on the EPA website at http://www.epa.gov/npdes by clicking on the "CSO" program area. In addition, EPA has printed a limited number of copies of each guidance document and has made them available through several sources:

- EPA's Water Resource Center ((202) 260-7786)
- National Small Flows Clearinghouse ((800) 624-8301 or http://www.estd.wvu.edu/nsfc)
- National Technical Information Service (NTIS) ((800) 553-6847 or http://www/ntis.gov)
- Educational Resources Information Center (ERIC) ((800) 276-0462 or http://www.aspensys.com/eric/catalog/)
- State environmental offices
- EPA Regional Offices

APPENDIX II

REMOVAL OF DESIGNATED USES - 40 CFR 131.10 (g) AND (h)
[excerpted from: EPA's Water Quality Standards Handbook:
Second Edition, Chapter 2.7 (1994)]

The basic steps for determining how and when a designated use may be removed are as follows:

Step 1 - Is the Use Existing? Once a use has been designated for a particular water body or segment, the water body segment cannot be reclassified for a different use except under specific conditions. If a designated use is an existing use (as defined in 40 CFR 131.3) for a particular water body, the existing use cannot be removed unless a use requiring more stringent criteria is added. However, uses requiring more stringent criteria may always be added because doing so reflects the goal of further improvement of water quality. Thus, a recreational use for wading may be deleted if a recreational use for swimming is added, or the state may add the swimming use and keep the wading use as well.

Step 2 - Is the Use Specified in Section 101(a)(2)? If the state wishes to remove a designated use specified in section 101(a)(2) of the Clean Water Act, the state must perform a use attainability analysis.

Step 3 - Is the Use Attainable? A state may change activities within a specified use category but may not change to a use that requires less stringent criteria, unless the state can demonstrate that the designated use cannot be attained using the factors in 40 CFR 131.10(g). For example, if a state has a broad aquatic life use, EPA generally assumes that the use will support all aquatic life. The state may demonstrate that for a specific water body, such parameters as dissolved oxygen or temperature will not support trout but will support perch when technology-based effluent limitations are applied to point source dischargers and when cost-effective and reasonable best management practices are applied to non-point sources.

Step 4 - Is a Factor from 131.10(g) Met? Even after the previous steps have been considered, the designated use may be removed, or subcategories of a use established, only under the conditions given in section 131.10(g). The state must be able to demonstrate that attaining the designated use is not feasible because:

1. Naturally occurring pollutant concentrations prevent the attainment of the use; or
2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the uses, unless these conditions may be compensated with sufficient effluent discharges; or
3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more damage than to leave in place; or

4. Dams, diversions or other types of hydrological modifications preclude the use, and it is not possible to restore the water body or operate the modification in such a way that would result in attainment; or
5. Physical conditions related to the natural features of the water body unrelated to water quality preclude attainment of aquatic life uses; or
6. Controls necessary to attain the use would cause substantial and widespread economic and social impact.

Step 5 - Provide Public Notice. As provided for in section 131.10(e), states must provide notice and opportunity for public hearing in accordance with section 131.20(b). Of course, EPA intends for states to make appropriate use of all public comments received through such notice.

APPENDIX III

LIST OF GUIDANCE TO SUPPORT USE ATTAINABILITY ANALYSES (UAAs)

EPA has published:

- *Technical Support Manuals for Conducting Use Attainability Analyses* (Volumes I-III, Rivers and Streams, Estuaries, Lakes, 1983 and 1984) http://www.epa.gov/ost/library/wqstandards/123.pdf. These three volumes each contain sections on assessing physical, chemical and biological characteristics of the specific water body type.

EPA has developed more recent guidance on assessing biological characteristics in the following documents:

- *Macroinvertebrate Field and Laboratory Methods for Evaluating Biological Integrity of Surface Waters* (1990) – EPA/600/4-90/030 (PB91-171363). This manual describes guidelines and standardized procedures for the use of macroinvertebrate studies in evaluating the biological integrity of surface waters. It was developed to provide biomonitoring programs with benthic invertebrate methods for measuring the status and trends of environmental pollution on freshwater, estuarine, and marine macroinvertebrates in fields and laboratory studies. These studies are carried out to assess biological criteria for the recognized beneficial uses of water, to monitor surface water quality, and to evaluate the health of the aquatic environment.

- *Fish Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters* (1992) – EPA/600/R-92/111. This manual describes guidelines and standardized procedures for the use of fish in evaluating the biological integrity of surface waters. It was developed to provide biomonitoring programs with fisheries methods for measuring the status and trends of environmental pollution on freshwater, estuarine, and marine habitats in field and laboratory studies. These studies are carried out to assess biological criteria for the recognized beneficial uses of water, to monitor surface water quality, and to evaluate the health of the aquatic environment.

- *Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams* (1998) – EPA/620/R-64/004F. This manual describes guidelines and standardized procedures for evaluating the biological integrity of surface waters. It was developed to provide the Environmental Monitoring and Assessment Program (EMAP) with bioassessment methods for determining the status and monitoring trends of the environmental conditions of freshwater streams.

! *Biological Criteria: Technical Guidance for Streams and Small Rivers, Revised Edition* (1996) – EPA/822/B-96/001.
This document helps states and tribes develop and use biocriteria for streams and small rivers. The document includes a general strategy for biocriteria development, identifies steps in the process, and provides technical guidance on how to complete each step, using the experience and knowledge of existing state, regional and national surface water programs. The document is designed primarily for water resource managers and biologists familiar with standard biological survey techniques. It should be used in conjunction with *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*.

! *Lake and River Bioassessment and Biocriteria, Technical Guidance Document* (1998) – EPA/841/B-98/007.
This document is intended to provide managers and field biologists with functional methods and approaches that will facilitate the implementation of lake bioassessment and biocriteria programs. Procedures are provided for program design, reference condition determination, field biosurveys, biocriteria development and data analysis. The document also provides information on the application and effectiveness of lake bioassessment to existing EPA and state/tribal programs. This guidance was developed through the experience of existing state, regional and national lake monitoring programs and several lake programs are used as case studies and examples to illustrate specific concepts and methods.

! *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers, Second Edition* (1999) – EPA/841/B-99/002.
This document provides state and local water quality monitoring agencies with a practical technical reference for conducting cost-effective biological assessments of lotic systems. Rapid Bioassessment Protocols (RBPs) are essentially a synthesis of existing methods that have been employed by various state water resource agencies. Protocols for three aquatic assemblages (periphyton, benthic macroinvertebrates, fish) and habitat assessment are presented. All of these protocols have been tested in streams in various parts of the country.

! *Estuarine and Coastal Marine Water Bioassessment and Biocriteria Technical Guidance* (December, 2000).
This technical guidance document is based on the concept that bioassessment and biocriteria programs for estuaries and near coastal waters are interrelated and critical components of comprehensive water resource protection and management. This guidance provides detailed descriptions of the appropriate habitat measurements that can be used to determine the homogeneous biological areas within an estuary (classification) and then describes four levels of investigative intensity or sampling tiers that can be used to collect the necessary bioassessment

data that is used in biocriteria derivation. Numerous different sampling methods and techniques that an investigator could choose are explained. The document also provides guidance on the process for deriving biocriteria from the bioassessment data and provides real-world examples from different estuaries around the country where bioassessments have been conducted and biocriteria developed.

In addition, EPA has published:

! *Interim Economic Guidance for Water Quality Standards: Workbook*, 1995. http://www.epa.gov/ost/econ

The Water Environment Research Foundation published:

! *A Suggested Framework for Conducting UAAs*;
! *Interpreting Results and a Comprehensive UAA Technical Reference*.

APPENDIX IV
DISCUSSION OF USE ATTAINABILITY ANALYSIS FOR RECREATIONAL USES

EPA is providing this discussion to help states and municipalities apply the *Guidance on Implementing the Water Quality-Based Provisions in The CSO Control Policy*. It is intended to respond to requests for information on evaluating whether recreational uses are attainable in waters affected by "wet weather" discharges, particularly in those urban areas affected by combined sewer overflow (CSO) discharges. Our objective is to enhance application of existing guidance for conducting use attainability analyses (UAAs), such as that contained in EPA's *Water Quality Standards Handbook*. EPA expects to supplement its UAA guidance based on recommendations received from a planned practitioners' workshop of state and EPA personnel involved in developing and reviewing UAAs.

Because this document focuses on water bodies affected by CSOs, the discussion refers to "states" rather than "states and authorized tribes"as the applicable decision-makers on attainment of designated uses. The Agency is not aware of any authorized tribes with combined sewer systems.

Several factors may influence UAA priority setting where waters are affected by CSOs, including 1) a court-ordered total maximum daily load (TMDL) analysis is underway on a receiving water where the NPDES Authority has approved the CSO long term control plan (LTCP); 2) the municipality (or separately permitted municipal dischargers located along the same river reach) has developed sufficient information to determine that the use is not attainable based on a water body survey and assessment of the factors in 40 CFR 131.10(g)(1)-(5); or 3) the level of CSO control to attain or no longer interfere with the attainment of water quality standards would cause substantial and widespread economic and social impact.

A UAA may be initiated at any time during the development of the LTCP. The municipality and appropriate state and EPA personnel should meet to agree on the data and information that would support a scientifically defensible UAA during the CSO LTCP process. Groups of municipalities on the same body of water may share in the data collection and analysis for a UAA. However, until some or all of the controls are implemented, uncertainties may remain as to whether the recreational use is attainable. If it is not, there may be further uncertainty in identifying the most protective attainable use. Prior to proceeding with a proposal to revise the use or to adopt a variance, the state must have sufficient information to fully support the action. As noted above, however, less complete information is generally required to support a variance than to support a permanent revision to the water quality standards.

I. WHAT ARE THE CURRENT LAWS, REGULATIONS, AND PRACTICES?

What are the applicable Clean Water Act (CWA) requirements for recreation?

! Section 101(a)(2) of the CWA establishes a goal that wherever attainable water quality provides for recreation in and on the water.

! Section 303(c)(2)(A) of the CWA states that standards shall protect public health or welfare, enhance the quality of water, serve the purposes of the Act and take into consideration their use and value for recreational purposes.

What are the applicable implementing regulations?

! Exhibit 1 paraphrases the regulatory requirements for designating recreational uses and evaluating their attainment.

How have states differentiated recreational uses and assigned protective criteria?

! **Primary contact recreation** – activities with a high potential for ingestion of water, associated with bacterial criteria sufficient to protect against the risk of excessive gastrointestinal illnesses and other criteria to support the recreational experience. Primary contact recreational uses are consistent with the 101(a)(2) recreational goals of the CWA; therefore, states do not need to support the adoption of this use with a UAA.

! **Secondary contact recreation** – activities with a low potential for ingestion of or immersion in water. These activities are associated with less stringent bacterial criteria, but with the lower risk of exposure, the less stringent criterion should result in no greater risk of gastrointestinal illness than water bodies designated for primary contact recreational uses. States must support adoption of secondary contact recreation with a UAA.

! **Seasonal primary contact recreation** – for areas where recreation only occurs during certain seasons; ensures that users of the water body are protected by sufficient bacterial criteria during the period of time when the activities are likely to occur.

! **Sub-categories of primary contact recreation** – state-specified periods of allowable intermittent exceedance of primary contact bacterial criteria.

! **Recreational fish or shellfish harvesting** – illness from consumption of fish is protected by criteria, fish advisories or shellfish bed closures.

What is a use attainability analysis (UAA) and how is it used?

! A UAA is 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 40 CFR 131.10(g).

! UAAs provide the state, public and EPA with analyses supporting adoption of:
  - S More protective uses where pollution controls have improved water quality.
  - S Uses that do not include the CWA 101(a)(2) primary contact recreation.
  - S Subcategories of primary contact recreation with allowable intermittent exceedance of primary contact bacterial criteria.

! UAAs can also support adoption of a variance (a temporary standard; short-term suspension of a use).

What are the objectives of a UAA?

- Identify existing uses.
- Provide sufficient information to determine whether the particular use is attainable.
- If the use is not attainable, identify the "highest" (i.e., most protective) attainable use, given the physical, chemical, and biological characteristics of the water body and the socioeconomic condition of the affected community.

What are the likely components of a UAA for recreation?

- A water body survey and assessment that examines the physical, chemical and if appropriate, the biological characteristics of the water body.
- An analysis of pollutant sources and loads to identify the pollutant loading reductions necessary to attain the use, if impairment is due to exceedances of criteria.
- Economic analyses to evaluate whether the cost of controls beyond those required by sections 301(b) and 306 of the CWA would result in substantial and widespread economic and social impact and, if so, identification of the most protective attainable use with the maximum affordable level of CSO control.

Who conducts a UAA?

- States, municipalities or consultants may collect the data and conduct the analyses.
- The state is responsible for evaluating the data and information.
- Only the state may determine whether the use is attainable. If the determination results in a proposed revision to water quality standards, the state must provide the UAA and the proposed revision to the public for review and comment and to EPA for approval or disapproval.

II. HOW ARE UAAs CONDUCTED?

EXHIBIT 1 - APPLICABLE REGULATORY PROVISIONS

40 CFR 131.10 provisions include:

(a) – specifying appropriate uses to be achieved and protected taking into consideration use and value for recreation in and on the water;

(b) – taking into consideration downstream waters and ensuring that WQS provide for the attainment and maintenance of downstream standards;

(c) – permitting adoption of sub-categories of a use and set the appropriate criteria to reflect the varying needs of such sub-categories;

(d) – making the determination that uses are attainable if they can be achieved by the imposition of effluent limits required under sections 301(b) and 306 of the Act and cost effective and reasonable best management practices for nonpoint source control;

(e) – providing notice and an opportunity for a public hearing prior to adding or removing any use or establishing sub-categories of a use;

(f) – allowing adoption of seasonal uses requiring less stringent criteria provided that such criteria do not preclude the attainment maintenance of a more protective use in another season;

(g) – authorizing removal of a designated use which is *not* an existing use or establishing sub-categories of a use if the state/tribe can demonstrate that attaining the designated use is not feasible because

1. **naturally occurring pollutant concentrations prevent the attainment of the use; or**
2. **natural, ephemeral, intermittent or low flow conditions or water levels prevent attainment of the use, unless these conditions may be compensated for with sufficient volume of effluent discharges without violating water conservation requirements; or**
3. **human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or**
4. **dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or**
5. **physical conditions related to the natural features of the water body unrelated to water quality preclude the attainment of aquatic life uses; or**
6. **controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.**

(h) – prohibiting removal of designated uses if:

1. **they are existing uses, unless a use requiring more stringent criteria is added; or**
2. **such uses will be attained by implementing effluent limits under sections 301(b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint source control;**

(i) – requiring revision of standards to reflect the uses actually being attained.

(j) – requiring a use attainability analysis whenever:

1. **State/tribe designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act; or**
2. **State/tribe wishes to remove a designated use that is specified in section 101(a)(2) or to adopt subcategories of the uses specified in section 101(a)(2) which require less stringent criteria.**

(k) – allowing adoption of the section 101(a) goal uses without a use attainability analysis.

40 CFR 131.12(a)(1) requires that existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

40 CFR 131.20(b) requires the state to provide the proposed water quality standards revision and supporting analyses for public review and comment.

What are the steps in conducting a UAA?

- ! If the state has a process or UAA protocol, that process or protocol should be followed with appropriate adjustments to account for site-specific factors.
- ! EPA allows a significant degree of latitude as long as:
  - S The process is inclusive.
  - S
  - S The data collected and analyzed are scientifically and technically defensible.
- ! Depending on the particular circumstances associated with the site and the combined sewer system, the state or EPA may request data to be added, or agree that existing data are sufficient.

Exhibit 2 Steps in Conducting a UAA

1. **Involve state, federal and local constituencies early in the process.**
2. **Reach agreement on the problem statement/objective of the UAA.**
3. **Analyze existing data/identify data gaps and agree on the additional data to be collected.**
4. **Identify and use an appropriate sampling and analysis plan, quality assurance/quality control procedures and statistical procedures**
5. **Agree on the bases that will be used to evaluate the information.**
6. **Collect and analyze the data and information**
7. **Integrate and summarize the data and information**
8. **Identify the uncertainties/evaluate the adequacy of information**
9. **Develop recommendations and identify the highest potential uses**
10. **Communicate the results and if appropriate, initiate revisions to water quality standards**

What are some general guiding principles?

- ! Building public trust and support for water quality standards actions will be facilitated by the involvement of a broad array of local constituencies throughout the UAA process, including citizen advisory committees and downstream constituencies.
- ! At a minimum, states must provide an opportunity for the public to review and comment on the analyses if the state proposes revisions to the water quality standards, including adoption of a variance.
- ! Early involvement of state and EPA personnel enables decision-makers to mutually agree on acceptable data and analyses.
- ! Problem and objective statements provide the basis for rebutting the presumption that the use is attainable, e.g.: "Identify which of the six factors in 131.10(g) will be used as the hypothesis for determining that the designated use is not attainable," and help the states identify the most protective use that is attainable.
- ! Throughout the process, there should be communication among state, EPA, and citizen advisory committees; updates on the data and analyses; and presentation of the preliminary findings, as appropriate.
- ! Any recommendation for revisions in the water quality standard should include an evaluation of the effect of the action on downstream uses, more sensitive uses in another

season, threatened and endangered species and their critical habitat, and designated essential fish habitat.

- Clear, concise presentation of data is essential if state decision-makers, the public, and EPA are to understand the basis of the recommendations.

What specific questions should be addressed for a recreational UAA?

- How does the state define primary contact recreation, and what activities are included (i.e. ensure that all parties fully understand the definition from the beginning of the process.)?
- What are the existing in-stream water uses, and levels of water quality necessary to protect the existing uses?
- At accessible locations along the water body or segment, is there sufficient flow, pool depth, etc., to attract adults to swim or children to play and splash?
- Does the public have access to the segment (e.g., roads, trails, bike paths, parks), or access either upstream or downstream of the location in question?
- Does the municipality or state have public policies or facilities that encourage public access, e.g., water front parks, boat ramps, bike paths, playgrounds, or festivals?
- Are people physically restricted from getting to the entire water body or segment in question by tall fences, locked gates, etc.?
- Is there potential for overcoming any impediments to the recreation use that are not related to water quality, e.g., removing shallow dams, or low flow augmentation?
- If primary contact recreational use is not attainable for reasons other than water quality, what level of water quality must be provided to protect existing uses, downstream uses (e.g., swimming, shellfish beds), any threatened and endangered species and their critical habitat, or designated essential fish habitat?
- What parameters in the CSO discharge cause or contribute to the impairment of the water quality standard? Depending on the parameter, what is the magnitude and extent of the impairment?
- What level of CSO control is needed to ensure CSOs no longer interfere with the attainment of the recreational use?
- What level of recreation (e.g., the maximum swimmable days during an average rainfall year) is supported by the maximum affordable level of control (e.g., the most protective attainable use)?
- Do any of the CSO control alternatives examined fully protect "waters with primary contact recreation" or "shellfish beds," two of the sensitive areas identified in Section II.C.3 of the CSO Control Policy which are to be given the highest priority for controls?
- Would the installation of controls necessary to assure that CSOs no longer interfere with the attainment of water quality standards cause substantial and widespread economic and social impact?[23]

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[23] See *Interim Economic Guidance For Water Quality Standards Workbook*, EPA-823-B-95-002, March 1995 at http://www.epa.gov/ost/econ.