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July 1998

Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program

The National Advisory Council For Environmental Policy and Technology (NACEPT)

Administrator Carol Browner
U.S. Environmental Protection Agency
401 M Street, S.W. (Mail Code 1101)
Washington, D.C. 20460

Dear Administrator Browner:

We are pleased to present to you the Final Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program, a subgroup of the National Advisory Council for Environmental Policy and Technology (NACEPT). This report responds to the U.S. Environmental Protection Agency's (EPA) charge to us to recommend ways to improve the effectiveness and efficiency of EPA, State, Territorial, and Tribal programs under Section 303(d) of the Clean Water Act.

As a diverse group of business, non-profit, and government people, we found our common commitment to improving the health of impaired waters enabled us to achieve consensus on many matters. Our recommendations address many of the TMDL program's complex technical and policy issues and suggest several new policy and programmatic directions. This report was signed by every member of the Committee. While there are three minority reports and the text of the report includes discussions of some issues on which members' views differed, we did agree on most of the important issues. We fully support EPA's plan to review and revise the current TMDL regulations and guidance through the usual Agency process of public participation and comment. We would be pleased to support this process as individuals in whatever way we can.

Thanks to you and Bob Perciasepe for providing us with outstanding support throughout our deliberations. We hope that you will give the recommendations in this report your full consideration.

Sincerely,

Members, Federal Advisory Committee on the TMDL Program

NOTICE

The following report and its recommendations have been written in conjunction with the activities of the National Advisory Council for Environmental Policy and Technology (NACEPT), a public advisory committee providing extramural policy information and advice to the Administrator and other officials of the U.S. Environmental Protection Agency (EPA). The Council is structured to provide a balanced, expert assessment of policy matters related to the effectiveness of the environmental programs of the United States. This report has not been reviewed for approval by the EPA. Hence, the contents of this report and recommendations do not necessarily represent the views and policies of the EPA, nor of other agencies in the Executive Branch of the federal government.

ABSTRACT

The National Advisory Council for Environmental Policy and Technology (NACEPT) is a public advisory committee originally chartered on July 7, 1988. NACEPT provides recommendations and advice to the Administrator and other EPA officials on specific topics identified by the Administrator and Deputy Administrator. NACEPT membership includes senior-level representatives of a wide range of EPA's constituents, including: business and industry; academia; Federal, State, and local government agencies; Tribal representatives; environmental groups; and non-profit entities. In 1996, the EPA Administrator requested that a subgroup of NACEPT be convened to provide advice and develop recommendations for strengthening the Agency's Total Maximum Daily Load (TMDL) Program.

The Federal Advisory Committee on the TMDL Program adopted its charge on November 19, 1996, as a subgroup of NACEPT. The Committee's charge included: recommending ways to improve the effectiveness, efficiency and pace of State, Tribal, and EPA TMDL programs under Section 303(d) of the Clean Water Act; recommending the appropriate role of States, Federal agencies, Tribes, and members of the public to achieve TMDL program success; and identifying barriers to success and recommending ways to overcome them. Based on substantive deliberations, the Committee has produced this report containing consensus stakeholder recommendations that fulfill this charge.

The Committee's specific recommendations cover many aspects of the TMDL program, including: identifying impaired waterbodies (listing); implications of listing a waterbody; pace and scheduling of TMDL development; criteria for developing and approving TMDLs; implementation planning; the TMDL allocation process; special challenges; public communications; stakeholder involvement; tribal participation; program/agency cooperation; and federal/State/Tribal capacity. The Committee recommends several new programmatic directions for EPA, and also endorses some approaches that are consistent with current EPA practice. The Committee's recommendations are based on the following broad areas of agreement:

- Restoring impaired waters must be a high priority for all responsible agencies and sources.
- Implementing TMDLs is the key to program success.
- Communication with the public is crucial.
- Stakeholder involvement in the TMDL program is a key to successful implementation.
- Governments' capacity to carry out the TMDL program needs to be strengthened significantly.
- In cases of uncertainty, an iterative approach to TMDL development and implementation will assure progress toward water quality standards attainment.

Acknowledgements

The Committee wishes to recognize the following individuals or organizations who contributed greatly to the Committee's deliberations. Included, in alphabetical order, are individuals and organizations that presented information to the Committee, provided comments at public comment sessions, supported Committee members in their efforts, or otherwise devoted significant time and energy.

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Preface/Signature Page

We, the members of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program, submit this report to the United States Environmental Protection Agency (EPA) for its consideration. Each of us is signing the report as an individual and not as a representative of any organization or group. Member affiliations are included below for identification purposes only.

In submitting the report, we are endorsing EPA's plan to review and revise the current TMDL regulations and guidance through the usual Agency process of public participation and comment. We hope that this report is useful in advancing this process but recognize that the formal rulemaking process and an open process for developing important program policies and guidance will best serve the interests of all affected parties.

In developing the report, members considered and took positions on a large number of highly complex issues in a very short period of time. The report contains many compromises. In accordance with the Committee's working definition of consensus, some recommendations are included even though they were opposed by one or two members. A member's signature does not necessarily represent agreement with everything in the report. The minority reports and certain sections of the report itself address some (but not all) areas where complete agreement was not achieved.

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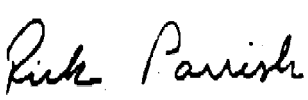

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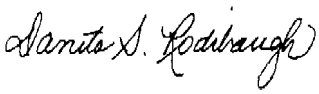

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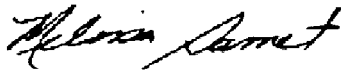

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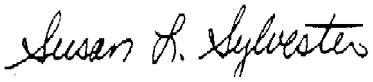

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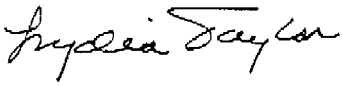

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Executive Summary

■ Program Mission

The primary mission of the TMDL program is to protect public health and secure the health of impaired aquatic ecosystems by ensuring attainment of water quality standards, including beneficial uses.

■ Key Principles of the Report of the Advisory Committee on the TMDL Program

The Committee's specific recommendations are based on the following broad areas of agreement.

- Restoring impaired waters must be a high priority for all responsible agencies and sources.
- Implementing TMDLs is the key to program success.
- Communication with the public is crucial.
- Stakeholder involvement in the TMDL program is a key to successful implementation.
- Governments' capacity to carry out the TMDL program needs to be strengthened significantly.
- In cases of uncertainty, an iterative approach to TMDL development and implementation will assure progress toward water quality standards attainment.

■ Identifying Impaired Waters/Listing

- Waters for which nonattainment is suspected but cannot be determined because more or higher quality data are needed should be identified by States and given high priority for additional monitoring.
- Waters are to be listed under §303(d)(1) if they show nonattainment with water quality standards, including numeric and/or narrative criteria and/or existing or designated beneficial uses.
- Waters should be de-listed (removed from the §303(d)(1) list) when they attain water quality standards or new information shows that the original basis for listing was inaccurate.
- Threatened waters expected to move from attainment to nonattainment with standards over the next two years should be placed on a discrete list for focused attention to prevent impairment.

■ Implications of Being Listed

Until a TMDL is completed, States must implement the current NPDES regulatory restrictions against permitting new point source discharges that will cause or contribute to the impairment; however, State/stakeholder-developed stabilization plans may offer flexibility if parameter-specific net progress toward attaining standards is demonstrated.

■ Pace and Scheduling of TMDL Development

- EPA regulations should provide that all TMDLs must be completed expeditiously but no later than 8 to 15 years after listing. EPA regulations should also provide that, generally, high priority TMDLs be completed within five years after listing.

- EPA should require by regulation that each State prepare a schedule for developing TMDLs for all listed waters. EPA should issue guidance describing factors that may be used to determine the order and pace for completing TMDLs. State workplans for completing TMDLs must show a reasonably proportionate effort over time (e.g., must not delay work on TMDLs to the end of the State's schedule for completing them).

■ Development of TMDLs

- To achieve water quality standards, the TMDL development/implementation planning process must produce seven components: 1) target identification; 2) identification of needed pollution reduction; 3) source identification; 4) allocation of pollution loads; 5) implementation plan; 6) monitoring and evaluation; and 7) procedures for any needed revision based on evaluation.

- In developing TMDLs, States and EPA must use the highest degree of quantitative analytical rigor available. A reasonable minimum amount of reliable data is always needed. Decisions and assumptions based on best professional judgment must be well-documented. TMDLs for which a high degree of quantitative analytical rigor is not possible in target identification and/or load allocation should contain relatively more rigor or detail in their implementation plans, including provisions for follow-up evaluation and potential revision based on the evaluation.

- In some instances, TMDLs may include surrogate measures and measures other than daily loads. These alternative measures must be protective of the water quality standard, and address the effects of the pollution causing nonattainment.

- EPA should revise its regulations to include basic principles for defining the geographic scope of TMDLs under various circumstances.

■ Implementation

- EPA should issue regulations requiring that an implementation plan be prepared for and submitted concurrently with each TMDL. Among other things, the implementation plan would describe control actions to be taken, the schedule for implementing those control actions, and reasonable assurances that load allocations will be met. The plan would also establish a follow-up monitoring and evaluation regime and a process for making any needed revisions based on the evaluation.

- In addressing point sources, States/EPA must set schedules for NPDES permit revisions to wasteload allocations. In addressing nonpoint sources, States must identify the management practices and measures to reduce, to the maximum extent practicable, the level of pollution they contribute. EPA must assure that the combination of point and nonpoint controls/measures is designed to attain water quality standards.

■ Allocations

- States have discretion in allocating pollution loads among sources as long as the allocations will meet TMDL targets, but EPA should provide guidance on appropriate principles and information on workable approaches to assist States.

- EPA/States should ensure that future growth is considered in all allocation decisions and that decisions on whether to allocate to growth, as well as the implications of these decisions, are well-documented.

- EPA should encourage States to allocate pollution reduction responsibilities equitably within a watershed framework. States may consider such factors as cost-effectiveness, technical and programmatic feasibility, relative source contributions, and certainty of implementation.

■ Special Challenges

- Waters impaired wholly or partly by extremely difficult historic problems are to be identified under §303(d)(1). TMDLs for these waters should provide for reasonable reductions from existing sources to the extent they can help achieve attainment, may allow a longer time for attainment than other TMDLs, and are expected to require creative solutions.

- EPA should conduct and encourage more research into the causes and solutions for waterbody impairments due to atmospheric deposition.

- Waters impaired wholly or partly by modifications to flow are to be identified under §303(d)(1). Federal agencies should help solve flow-related nonattainment problems within their jurisdiction. EPA should provide assistance and information to States on addressing flow issues in TMDLs.

■ Public Communications

Two-way communication with stakeholders, including the general public, is a critical element of a successful TMDL program. States and EPA should actively solicit citizen comments, consider citizen-nominated waters for §303(d)(1) listing, encourage citizen monitoring, and distribute educational materials to stimulate public interest/involvement in watershed restoration and protection.

■ Stakeholder Involvement

States and EPA should encourage and help stakeholders play an active role in supporting TMDL development. States (and EPA, for any TMDLs for which it is responsible) should have written agreements with stakeholders who will play a substantial role in TMDL development, including funding and participation in data collection and analysis. States and EPA cannot delegate their legal responsibility to ensure the adequacy of TMDLs and public participation processes and should be involved in stakeholder efforts to support TMDL development.

■ Tribal Participation

EPA should increase efforts to help educate Tribes about water quality programs, including TMDLs, and to ensure that EPA and State water quality staff respect the government-to-government relationship with Tribes in all TMDL activities.

■ Program/Agency Cooperation

- States should cooperate with each other and with Tribes to resolve shared water quality problems, with EPA stepping in as necessary to address multi-jurisdictional problems.

- EPA should ensure that programs under the Clean Water Act, the Clean Air Act, CERCLA, RCRA, FIFRA, and its other authorizing statutes, are coordinated and implemented effectively to ensure attainment of water quality standards.

- Federal agencies should work cooperatively and proactively with EPA and States and must engage in all appropriate activities with respect to attainment of State water quality standards and other Clean Water Act requirements.

- States are responsible for developing TMDLs on federal lands, with EPA assistance. Federal land managers must assure that (waste)load allocations over which they have authority and oversight are met.

■ Federal/State/Tribal Capacity

- A national dialogue at high policy levels is needed to increase support for and commitment to restoring impaired waters.

- EPA needs to strengthen its technical guidance and support to improve program efficiency and State capacity to develop effective TMDLs.

- Additional investments and/or reprogrammings of resources are needed to increase EPA, State, and federal land management agency TMDL efforts, including efforts to improve State and federal monitoring programs.

- EPA should support State and Tribal TMDL program capacity-building efforts by, among other things, providing sound analytical tools and methods to assess resource/staffing needs.

Chapter 1: Background on the Committee

1.1 THE COMMITTEE'S CHARGE

The Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program (hereafter referred to as "the Committee") was established in November 1996 by the United States Environmental Protection Agency (EPA). The Committee is charged with recommending ways to improve the effectiveness and efficiency of State, Tribal, and EPA programs under §303(d) of the Clean Water Act. The Committee is a subdivision of the National Advisory Council for Environmental Policy and Technology (NACEPT), and was established under the authority of the Federal Advisory Committee Act. A copy of NACEPT's specific charge to the Committee is contained in Appendix A.

Generally, EPA and NACEPT asked the Committee to develop advice on new policy and regulatory directions for the program regarding its role in watershed protection, the identification of impaired waters, the pace of TMDL development, the science and tools needed to support the program, and the roles and responsibilities of States, Tribes, and EPA in implementing the program. In doing so, the Committee was charged with identifying barriers to program success, recommending ways to overcome them, and suggesting criteria by which to measure the success of each recommendation implemented. The Committee's charge explicitly excluded recommending statutory changes or changes to Congressional appropriations.

1.2 THE COMMITTEE'S MEMBERSHIP

The twenty TMDL Committee members were appointed by EPA Deputy Administrator Fred Hansen, based on a determination that the group would be geographically balanced and highly motivated, including individuals with diverse interests in, knowledge of, and broad perspectives on the complex issues involved. Members included State officials with responsibility for managing the program, local officials, a Tribal consortium representative, farmers, a forestry representative, environmental advocacy group representatives, industry representatives, a law professor, the executive director of a watershed management council, and an environmental consultant. They also had broad experience in both government and the private sector. The members brought with them diverse professional expertise, including law, science, public policy, management, public advocacy, and engineering.

Representatives of the United States Department of Agriculture's Natural Resources Conservation Service, the United States Forest Service, and EPA's Office of Water served as ex officio members of the Committee and provided information and perspectives on the issues.

A complete list of the Committee's members, along with their affiliations, is included as Appendix B.

1.3 THE COMMITTEE'S PROCESS

The Committee met in six plenary sessions of two to three days each between November 1996 and May 1998. Meetings were held at various locations around the country in order to encourage public participation reflecting diverse regional concerns about TMDL development and

watershed management. Meeting locations included: Herndon, VA; Galveston, TX; Milwaukee, WI; Portland, OR; Salt Lake City, UT; and Atlanta, GA.

Each meeting was announced in the Federal Register and announcements were circulated to interested parties in the general locale of the meeting site. Each meeting was open to the public and included at least one public comment session during which members of the public provided advice and recommendations to the Committee on a wide range of water quality protection matters. Committee members often engaged in dialogue with members of the public during these sessions. In addition, documentation of Committee proceedings has been made available through an EPA web site (http://www.epa.gov/OWOW/tmdl/advisory.html) and in hard copy to many parties interested in TMDLs.

The Committee established ground rules to govern its operations, a copy of which is provided at Appendix C. Generally, its process was intended to identify problems, work toward solutions, and achieve a consensus on specific recommendations through open discussion and exchange of views. For example, some plenary sessions included breakout sessions in which several small groups of members worked on the same issues in order to allow time for detailed dialogue without the formality of a full Committee deliberation. These breakout sessions were open to the public.

In addition to its plenary meetings, subgroups of the Committee met by teleconference on a regular basis in the periods between plenary sessions. The Committee established five standing Workgroups: (1) Listing (to address the process for identifying and tracking impaired waters); (2) Science and Tools (to identify priorities for strengthening the technical aspects of the TMDL program); (3) Criteria for Approval (to address the requirements for an adequate TMDL); (4) Management and Oversight (to address roles and responsibilities of government agencies and oversight of the program); and (5) Framework (to assure that the Committee's process would lead to a unified vision for the TMDL program). These Workgroups and a variety of ad hoc subgroups developed issues analyses and recommendations for the full Committee and worked toward a consensus on specific issues primarily through telephone conferences and exchange of draft documents. Members also worked together in small groups and one-on-one outside formal Committee proceedings to explore issues and reach consensus.

The Committee was supported by EPA staff and by consultants retained by EPA to help arrange meeting logistics, prepare agendas, gather necessary background information, document proceedings, draft issue papers and provide analysis as appropriate, facilitate plenary and subgroup meetings, and foster public participation. Information on the consultants, who were from Ross & Associates Environmental Consulting, Ltd. and Tetra Tech, Inc. is provided in Appendix D.

Because of the limited time available to it, the Committee did not have time to address some of the issues considered important by one or more members. A list of these unaddressed issues is included as Appendix E.

Chapter 2: Introduction

2.1 OVERVIEW OF THE TMDL PROGRAM

The TMDL program is aimed specifically at assuring attainment of water quality standards by requiring the establishment of loading targets and allocations for waters identified as not now in attainment with those standards. Generally, §303(d)(1) of the Clean Water Act (the Act) provides that States, with EPA review and approval, must identify waters not meeting standards and establish total maximum daily loads (TMDLs) for them to restore water quality. If the States do not complete these actions, EPA must do so.

The Act includes several other programs that also help restore and maintain the quality of the nation's water resources. These programs include national technology-based effluent limitation guidelines, national water quality criteria guidance, State water quality standards, State nonpoint source management programs, funding provisions for municipal wastewater treatment facilities, State water quality monitoring programs, and the National Pollutant Discharge Elimination System (NPDES) permit program for point sources. These programs have produced significant and widespread improvements in water quality over the last quarter-century. Knowledge and understanding of water quality problems and the tools to address those problems have advanced in that time in that time as well, but many waters still do not meet State water quality standards, and TMDLs have not been established for most of those waters.

Two programs very closely related to TMDLs—water quality monitoring and water quality standards—are of particular concern to the Committee. More and higher quality data on water quality are needed for proper identification of impaired waters and to support TMDL development. In addition, without adequate and complete water quality standards, including numeric and narrative criteria to support beneficial uses, water quality problems may not be identified and TMDL development will be slower and more difficult. Strengthening the monitoring and standards programs will help strengthen the TMDL program.

The final National Water Quality Inventory Report to Congress for 1996 indicates that of the 19% of the nation's rivers and streams that have been assessed, 35% do not fully support water quality standards or uses and 8% are considered threatened. Of the 72% of estuary waters assessed, 38% are not fully supporting uses/standards and 4% are threatened. Of the 40% of lakes, ponds and reservoirs assessed (not including the Great Lakes), 39% are not fully supporting uses/standards and 10% are threatened.

Generally, under §303(d)(1), States are required to identify and establish a priority ranking for waters not meeting water quality standards, taking into account the severity of the pollution and the uses to be made of the waters. EPA is required to review each State list and approve it or, if it is deemed inadequate, to disapprove it and prepare a list for the State. Once the list is established, States are to develop a TMDL for each listed water. EPA is also required to review and approve or disapprove each TMDL (within 30 days of submittal by the State) and then establish a TMDL in the case of any disapproval. This program to address waters not meeting water quality standards is known as the "TMDL Program."

The Act (in §303(d)(3)) requires that States estimate TMDLs for informational purposes, but

they need not be submitted to EPA for approval and EPA has no direct authority to step in if a State fails to act. Although some TMDLs have been completed for waters not listed under §303(d)(1), States have not adequately implemented the requirement of §303(d)(3) to complete TMDLs for all waters. It should be noted that a water may be in nonattainment for some parameters of applicable standards but not other parameters and, therefore, may fall under both §303(d)(1) (for the nonattainment parameter) and §303(d)(3) (for the attainment parameter). Generally, the TMDL program uses a parameter-specific approach. However, the use of a broad, watershed approach, considering all water quality problems and their related causes and solution, is to be preferred and encouraged.

In general, a TMDL is a quantitative assessment of water quality problems, contributing sources, and pollution reductions needed to attain water quality standards. The TMDL specifies the amount of pollution or other stressor that needs to be reduced to meet water quality standards, allocates pollution control or management responsibilities among sources in a watershed, and provides a scientific and policy basis for taking actions needed to restore a waterbody.

In 1991, EPA published guidance explaining the role of TMDLs in watershed protection. In 1992, EPA amended its regulations to describe in greater detail requirements for States to submit lists of waters needing TMDLs. Among other things, the revised regulations required States to submit lists every two years and to target waters for which TMDLs would be developed during the next two years. (See Appendix F for copies of the statutory and regulatory language.) Over the past few years, EPA has published several additional guidance and policy documents relating to §303(d)(1) lists and TMDL development.

Indian Tribes, as well as States, may be authorized to implement the TMDL program for waters within their jurisdiction. To date, however, most Tribes involved in water quality management are focusing on establishing water quality standards and other Clean Water Act programs and/or are building watershed-based cooperative management processes. No Tribe has yet sought or received authorization to carry out the federal TMDL program.

Beginning in 1986 and escalating since 1996, environmental public interest organizations have filed numerous lawsuits under the Clean Water Act's citizen suit provision (§505) alleging that EPA had failed to carry out its mandatory duty to disapprove inadequate State §303(d)(1) lists and/or TMDLs or to carry out State program responsibilities where States failed to do so. As of the beginning of 1998, more than 20 suits had been filed. Five additional notices of intent to sue were also pending in early 1998. At that time, about ten of the lawsuits had resulted in court orders and/or settlements with plaintiffs. (A number of these settlements were based on State commitments to EPA to establish TMDLs on a specified schedule and EPA commitments both to step in if States falter and otherwise strengthen the TMDL program.) Some suits had been dismissed and others were still pending.

Currently, all States have EPA-approved 1996 §303(d)(1) lists, but the content and scope of these lists vary greatly among States. Development of TMDLs is being initiated at an increasing pace in some States, but most TMDLs remain to be completed. Many of the waters still needing TMDLs are impaired by contributions from both point and nonpoint sources.

EPA has undertaken a variety of steps to strengthen the TMDL program, including establishing this Federal Advisory Committee.

2.2 KEY PRINCIPLES

The detailed recommendations in this report are based on certain important broad areas of agreement among Committee members. Key among these areas of agreement are the six inter-related precepts in this Section.

1. Restoring Impaired Waters Must Be a High Priority for All Responsible Agencies and Sources

Waters not meeting the Clean Water Act's basic goals deserve special care and attention. Section 303(d)(1) establishes the Clean Water Act's primary mechanism for addressing water quality impairments—the TMDL program. Developing and implementing TMDLs, as required by the Act, should be a high priority for EPA and State agencies, federal land managers, point sources and nonpoint sources, local governments, and other stakeholders. Many provisions of the Act address impaired waters and authorize actions to improve water quality. (Note, for example, that §304(l) focuses on waters impaired by toxic pollutants and §319 focuses on waters impacted by nonpoint sources.) However, of all Clean Water Act provisions, only the §303(d)(1) TMDL program provisions focus broadly on waters that do not meet water quality standards, including beneficial uses.

The Committee believes it is critical for stakeholders as well as relevant federal and State agencies, to assign high priority to supporting completion of and implementing TMDLs. All contributors to remaining impairments—e.g., including affected point and nonpoint sources, industry, agriculture, forestry, mining, construction, municipalities, and affected tax- and rate-payers—are among stakeholders in the TMDL program and need to contribute to solving these problems. Federal land managers should also help assure completion and implementation of needed TMDLs on the lands they manage. As a matter of equity, all those sectors of society preventing the nation's waters from attaining their full beneficial uses should contribute to cleaning up impaired waters. All stakeholders, including environmental groups, resource users, and the general public, have a right to participate fully in all aspects of TMDL decision making.

2. Implementing TMDLs Is the Key to Program Success

This Committee's primary interest is in expeditiously eliminating water quality impairments. The TMDL program must help the nation achieve the federal goal of restoring and protecting the physical, chemical and biological integrity of the nation's waters. To do this, the pace of TMDL development needs to be increased substantially, and TMDLs need to be implemented promptly. The identification of impaired waters and development of TMDLs will require a significant commitment of State and federal resources and must not be merely a planning exercise to satisfy a statutory directive. TMDLs must be implemented if standards are to be attained.

Improving the TMDL program, in large measure, will mean improving the way a wide range of State and federal actions are directed at restoring impaired waters. Direct ties are needed between the TMDL program and the programs that implement TMDL allocations to keep efforts focused on achieving water quality improvements and restoring full protection of beneficial uses. The TMDL itself does not establish new regulatory controls on sources of pollution. (For example, wasteload allocations for point sources need to be

incorporated into enforceable NPDES permits.) To assure implementation of TMDLs, EPA, States, Tribes, federal land managers, and local governments must effectively exercise their legal authorities and mobilize programs, resources, incentives, and public education efforts to implement TMDLs. Private landowners, businesses, and citizens must respond to these challenges with their own efforts, resource commitments, and support for water quality restoration. States and EPA need to establish definite milestones and schedules for specific actions to fully implement TMDLs.

3. **Communication with the Public is Crucial**

All stakeholders, including the general public, have a right to know about the health of their water bodies and, especially, about waters that are impaired and require corrective action. Stakeholders have a right to participate by contributing information and views as decisions are being made about actions that will affect water quality. When stakeholders contribute reliable, relevant information on water quality, agencies must consider that information in making listing decisions and developing TMDLs. It is critical that States and the public exchange information and views early in the process, when decisions are being considered on the need for additional data collection and States are interpreting their standards for use in the listing and TMDL development processes. State and EPA public communications on TMDLs need to be more inclusive and consistent than they have been to date.

4. **Stakeholder Involvement in the TMDL Program Is a Key to Successful Implementation**

Agencies sometimes lose sight of the need to motivate and involve those who can or are required to take action to remedy water quality impairments. Inviting and encouraging stakeholders to become involved and winning their support and commitment to implement TMDLs is important in all aspects of the program. This may be especially useful in stimulating voluntary action that goes beyond compliance with regulatory requirements.

Environmental agencies need to work with stakeholders, including the general public, on TMDL development and implementation on an individual watershed basis. States and EPA have a responsibility to establish and foster existing effective partnerships with businesses, governments at all levels, private landowners, resource user groups, environmental advocacy groups, watershed councils, and others with the potential ability to advance implementation of a TMDL. Where new efforts are needed to establish effective working relationships, these efforts should begin at the time characterization of a water is beginning and continue through the TMDL process, until attainment is achieved. States and EPA retain responsibility for making listing and TMDL establishment decisions in accordance with the law, but stakeholders will support governmental decisions and take action to solve water quality problems most readily when they are involved in the overall process.

5. **Governments' Capacity to Carry Out the TMDL Program Needs to Be Strengthened Significantly**

More needs to be done in most aspects of the program to assure development and implementation of TMDLs, a higher degree of consistency (nationally, regionally, and within

States), and a more sound scientific and policy basis for decision making. From water quality standards-setting to ambient monitoring and through TMDL implementation follow up, more complete and useful national regulations, guidance, technical support, and tools are needed. In almost all program areas in both EPA and State water quality agencies, staffing levels and resources need to be increased in order to meet the program's challenges.

The Committee is pleased that EPA has worked closely with it over the past months and has continued to make progress in strengthening TMDL program guidance and technical support. However, the infrastructure (including regulations, guidance, technical support, modeling tools, ambient data, and staffing) of the TMDL program is inadequate given the need to address water quality impairments. Efforts to achieve improvements must increase. Not only EPA, but also other federal agencies need to determine how to adjust programs and activities and take action wherever possible to carry out the law more effectively to assure water quality standards attainment. Federal capacity to support TMDL program objectives needs to be increased.

At the State level, similar capacity and infrastructure improvements are needed. Technically sound, comprehensive water quality monitoring, increased and more effective coordination of water quality programs (including but not limited to Clean Water Act programs), and more technical expertise in TMDL-related matters are critical. Funding and staffing levels in State TMDL (and TMDL-related) programs are lower than is needed to meet the requirements of federal law. EPA can support States in improving their capacity to carry out the TMDL program by, among other things, providing tools for appropriate resource needs analysis and promoting a national dialogue on the importance of restoring impaired waters to water quality standards attainment.

6. In Case of Uncertainty, an Iterative Approach to TMDL Development and Implementation Will Assure Progress toward Water Quality Standards Attainment

In all cases, the goal of the TMDL program is to establish TMDLs that will lead to expeditious attainment of water quality standards. For many waters, TMDLs can be developed and implemented with confidence based on readily available data. For some waters, there may be less certainty about how to restore water quality or, despite best efforts, the initial TMDL does not produce full attainment of water quality standards. Even in these cases, progress can be made.

Lack of certainty is not an excuse for inaction. Rather, it is a reason to use the best possible data readily available on each impaired water and then to take a reasonable, balanced, scientifically defensible, iterative approach to setting goals and implementing actions to achieve standards. States should set goals and develop implementation plans based on reliable existing data, provide for additional data gathering and monitoring of results achieved, assess the need for revision according to specified schedules, and revise goals and implementation plans as appropriate. It is always necessary to use the best available science and the most reliable, readily available data to avoid imposing unnecessary costs on sources and to assure the efficacy of strategies to meet standards.

On a broad programmatic basis, some general TMDL decision criteria can be simple and clear-cut and, where this is the case, the criteria should be clearly defined by EPA. However, much of EPA's TMDL guidance will need to address categories of waters, stressors, or sources, rather than generalizing for all of them. Additional

research may be necessary to address unanswered scientific questions. Procedures and decision criteria may need to consider a wide range of complex hydrological, chemical, biological, physical, political, economic and social issues. This will take time. Qualified professionals need to make judgments based on the facts, current scientific understanding, and reasonable, scientifically defensible assumptions. In the end, there may be relatively few "cookie-cutter" approaches to developing TMDLs for impaired waters. However, as TMDLs are completed for difficult problems, later TMDLs for similar problems will be easier to complete. For certain TMDLs, the iterative approach will allow for expeditious progress toward attainment of water quality standards as EPA's guidance and the general level of scientific understanding continue to improve.

The following chapters of this report address specific aspects of the TMDL program that the Committee has identified as particularly important to the TMDL program. The recommendations in these chapters are intended to assist EPA in identifying the highest priorities for strengthening the program. The Committee focused on policy rather than legal considerations. Some members are confident that legal authority exists for implementation of the Committee's recommendations. Other members are uncertain whether legal authority exists for implementation of some recommendations. The Committee recognizes that EPA will need to determine whether authority exists.

2.3 CLARIFICATION OF KEY TERMS

- Throughout this report, the term "**pollution** load allocation" is used in lieu of "**pollutant** load allocation." The Committee recognizes that there legal questions have been raised over whether TMDLs are required for all types of pollution, or only for the discharge of pollutants. However, the Committee was not able to reach agreement on this legal issue. ("Pollution" is used as a default term for reasons related to the drafting history of the report.) Some members of the Committee believe that TMDLs for all sources of pollution are necessary to address all impaired waters listed under §303(d)(1). Other members believe that the program should be limited to pollutant loads because TMDLs are best suited to addressing those issues.

- Throughout this report, where States are mentioned, **Tribes** that may ultimately be authorized to implement the program are intended to be included. Tribes may also be stakeholders in TMDL processes for waters not on their lands but affecting their rights or water quality. Throughout this report, wherever stakeholders are mentioned, such Tribes are intended to be included.

- The term **stakeholders**, as used in this report, is intended to be read broadly, and would include, at a minimum, the following: the general public; environmental and other public interest groups; affected tax- and rate-payers; affected point and nonpoint sources (including industries, landowners, and wastewater treatment owners and operators); and interested or affected governmental units with public responsibilities but who are not directly responsible for TMDL development (e.g., local governments and various State, Tribal, and federal agencies).

CAUTION TO READERS OF THIS REPORT:

It is very important to read the recommendations in this report together, as a whole. Individual recommendations should not be taken out of context. Many Sections and recommendations in the report are interrelated and some components are explained or clarified in other Chapters.

Chapter 3: Identifying Impaired Waters

BACKGROUND

Section 303(d) of the Clean Water Act directs States, authorized Tribes, and/or EPA to identify and list all waters for which the first round of technology-based standards are not stringent enough to meet applicable water quality standards. By regulation, EPA expanded upon this provision to include more stringent effluent limitations and pollution control requirements. According to EPA, waters that do not meet any water quality standard component, including numeric or narrative criteria or designated uses, must be included on the §303(d)(1) list.

EPA regulations at 40 CFR 130.7(b)(5) direct States to base listing decisions on "all existing and readily available water quality-related data and information," including both monitored and evaluated data and information. "Monitored" data refers to direct measurements of water quality, including sediment and some fish tissue analyses. "Evaluated" data and/or information provides an indirect appraisal of water quality through information on historical adjacent land uses, riparian health and habitat, the location of sources, results from predictive modeling using input variables, and some surveys of fish and wildlife.

3.1 DATA REQUIREMENTS FOR §303(d)(1) LISTING

Problem Statement

Well-designed monitoring programs are vital elements in environmental agencies' overall efforts to characterize, identify, and ensure the protection and restoration of waters not meeting or not expected to meet water quality standards. However, monitoring is expensive and time-consuming and environmental agency resources for monitoring have declined in recent years. Monitoring resources will need to be carefully focused to have the greatest positive influence on water quality.

We recognize that the costs associated with implementing TMDLs may impact communities and businesses located along listed waters. If properly implemented, however, the TMDL program will improve the quality of waters listed pursuant to §303(d)(1) and will benefit those communities and businesses, as well as the environment. It is critical that §303(d)(1) listing decisions be based on high quality, sound scientific information. If waters are now listed on the basis of inadequate data, however, TMDL development resources are being diverted from addressing clearly documented impairments. On the other hand, some States may currently be omitting waters from their §303(d)(1) lists for which some, though inadequate or incomplete, data and/or information indicate nonattainment of standards. In addition, only a fraction of all waters are monitored to identify impairments, and many other waters are tested for only limited types of impairments. What are the minimum data requirements needed to support §303(d)(1) listing? Should States omit waters from their lists on the basis of data age, quantity, type, or source? How should evaluated data or information be used during listing?

Discussion

The Committee endorses EPA's position that listing decisions should be based on

"all existing and readily available water quality-related data and information." A State's first and most important task is to use the best information it can acquire to conscientiously identify all waters within its boundaries that do not meet water quality standards. (Some additional suggestions for improving water quality monitoring for TMDLs are also provided in Chapter 10 of this report.) We encourage agencies to establish QA/QC programs and other means of assuring that water quality data are reliable and to consider all reliable data and information, including that collected by citizen volunteers and dischargers, during §303(d)(1) list development.

For types of impairment amenable to assessment using monitored data, we strongly prefer basing §303(d)(1) listing decisions on monitored data but recognize that most environmental agencies' monitoring networks may not be comprehensive enough to provide such information, both in terms of the geographic scope and the types of data collected. We recognize, furthermore, that some types of impairments may not be amenable to monitored data. As a result, agencies may sometimes need to use evaluated data and information. Evaluated data and information can be especially useful in determining attainment of uses. This information is appropriate to use in direct support of listing decisions, however, only when it is reliable and in accordance with applicable data collection and/or QA/QC program requirements.

Inefficiencies in coordinating and funding monitoring programs create barriers to the accurate identification of waters not meeting water quality standards and supporting TMDL development. This is a problem State, Tribal, and EPA monitoring programs must address and is a serious concern to the Committee. (See Chapter 10 for more discussion on this point.) Because the Committee's charge was to recommend changes to the TMDL program, specifically, we did not study monitoring program issues in detail.

Our recommendations in this section focus most specifically on EPA actions to improve initial identification of water quality impairments in support of §303(d)(1) listing. Data collected to assess attainment of all components of water quality standards (rather than just numeric criteria) will allow faster and more reliable §303(d)(1) listing decisions.

▶ Recommendations

1. The Committee recommends that EPA require and assure needed improvements in State efforts **to monitor waters to characterize the general health of aquatic systems and determine (non)attainment of any component** of water quality standards, including narrative criteria and designated uses.

2. The Committee recommends that EPA encourage States to **collaborate with** water utilities, other agencies, and **other stakeholders to identify** impaired drinking water supplies and other types of **nonattainment**.

3. The Committee recommends that EPA issue guidance providing that States base listing decisions to the maximum extent possible **on monitored and evaluated data and information gathered in accordance with appropriate QA/QC program and data collection and analysis protocols**.

4. The Committee recommends that EPA **revise §106 guidance**, as appropriate, to reflect State monitoring program changes needed to support §303(d)(1) listing needs.

5. The Committee recommends that EPA strongly encourage States to identify (on a **separate non-§303(d)(1) list) waters** for which **some data indicate impairment** (although the data are not conclusive), and to give these waters priority for monitoring attention.

3.2 LIST COMPREHENSIVENESS

Problem Statement

The Clean Water Act in §303(d)(1) directs States to (1) identify all waters within their boundaries for which the first round of point source effluent limitations are "not stringent enough to implement any water quality standards applicable to such waters," (2) include these waters in a §303(d)(1) list submittal to EPA, and (3) rank and schedule these waters for TMDL development. Should States be allowed to consider factors other than nonattainment during §303(d)(1) list preparation? Should States be required to list all impaired waters or can special exemptions be provided, such as factors related to uncertainty, cost, availability of Clean Water Act controls, or deference to other watershed programs?

Discussion

The §303(d)(1) list should, and under law must, identify waters that do not meet water quality standards following the application of required pollution controls. The Committee concurs with EPA's current approach of considering all components of water quality standards, including use designations, during §303(d)(1) listing. (However, see Section 3.3 (Threatened Waters) and Section 6.2. (Atmospheric Deposition) for further Committee discussion of specific related issues.)

We recognize that State/Tribal numeric criteria may not adequately reflect the desired water quality condition to support existing and designated uses and may occasionally need to be revised (e.g., to address natural background conditions appropriately or to establish additional numeric criteria to protect designated uses). Such deficiencies, however, cannot be wholly "cured" through the TMDL program but must also be addressed by State/Tribal standards programs. We are very concerned about the need to improve and further develop EPA's water quality criteria guidance and State/Tribal water quality standards and encourage EPA to strengthen these programs in the near future. The Committee, however, did not discuss water quality standards program issues in detail.

▶ Recommendations

1. The Committee recommends that each State §303(d)(1) list identify waters not attaining water quality standards (including narrative and numeric criteria and beneficial use designations). (But, See Section 3.3 regarding Threatened Waters, Section 3.4, regarding waters expected-to-meet standards based on existing or planned control requirements, and Chapter 6 regarding other Special Situations.)

2. The Committee recommends that EPA issue guidance and regulations that **explain how** States are to **apply narrative criteria** in §303(d)(1) listing.

3. The Committee recommends that the possibility of **future standards revisions not delay TMDL development**. EPA should encourage States to conduct their reviews of water quality standards in a timely manner, and in accordance with established water quality review standards. If, however, States modify existing standards, they should not wait until the next listing cycle to determine whether the water does not meet the newly adopted standard.

4. The Committee recommends that EPA, in conjunction with States and Tribes, **develop a strategy for addressing drinking water contaminants**, especially pathogenic organisms in source water, in water quality standards, §303(d)(1) listing decisions, and TMDLs. Similar strategies should be developed for **other types of severe water quality problems** such as those related to fish contamination and severe aquatic life impairment.

3.3 THREATENED WATERS

Problem Statement

One of the Clean Water Act's fundamental goals is to protect water quality from deterioration. This goal is to be implemented, in part, through antidegradation policies, which are components of State/Tribal water quality standards. EPA's antidegradation policy seems to be inconsistently applied by States and Tribes. As a possible result, waters that might have been protected from imminent impairment have not been and, over time, may move out of attainment with water quality standards. Generally, the Committee considers it more desirable, both economically and environmentally, to protect than to restore water quality. Given this, how should threatened waters be treated under §303(d)(1)?

Discussion

EPA's regulations direct States and authorized Tribes to identify threatened waters on the §303(d)(1) list but do not specifically define such waters. To date, this listing requirement has not been strictly followed even though threatened waters may benefit from TMDL program attention. Through the TMDL process, environmental agencies aware of a water's "threatened" status can make appropriate management decisions for such waters (e.g., on permitting, nonpoint source program priorities, and monitoring) and thus prevent impairments. On the other hand, States/Tribes could rely on other existing Clean Water Act authorities (e.g., the antidegradation policy and §319 programs) to address threatened waters without relying on TMDLs.

If threatened waters were not identified on §303(d)(1) lists, the TMDL program could focus more effectively on addressing existing impairments.

▶ Recommendations

1. The Committee recommends that EPA adopt by regulation the following **definition of threatened waters** if the agency continues to require §303(d)(1) listing of these waters.

   "Threatened waters are those waters that are **likely to exceed water quality standards** within the **next two years** (i.e., within the next §303(d)(1) listing cycle). This determination should be based on data that show a statistically significant declining trend or on agency knowledge of specific pending changes (e.g., requests for new permits) that would adversely impact water quality."

2. The Committee recommends that EPA and State water quality programs work to **protect waters in attainment with standards from further degradation** and provide incentives/disincentives to keep waters from moving to nonattainment status.

3. The Committee believes it would be desirable for States/Tribes to **deal with threatened waters in a consistent manner**.

4. The Committee recommends that threatened waters be addressed at a **geographic scale** that allows the State to identify and **address broadly the causes of and potential solutions** to the pending water quality **nonattainment problem**. Constraints placed on source activities along threatened waters should be tailored to the specific problem/situation.

5. The Committee recommends that EPA **strengthen its implementation** of federal **antidegradation requirements** and require full implementation of State antidegradation policies.

6. The Committee recommends that threatened waters be put on a **discrete list for focused attention**, with the goal of keeping them from becoming impaired.

7. The Committee recommends that a **watershed-based loadings analysis** be performed for threatened waters as soon as possible, consistent with the State's TMDL priority list, but at a minimum before the State issues new or modified permits that allow increased discharges to a threatened water or allows other actions that would contribute to increased pollution to a threatened water over which the State has approval authority. The analysis would not necessarily include all of the components of a TMDL for impaired waters, but would have to provide for restoration so that the water is no longer threatened.

3.4 POSSIBLE EXEMPTIONS FROM LISTING FOR WATERS SUBJECT TO ALTERNATIVE CONTROL STRATEGIES (THE SO-CALLED "EXPECTED TO MEET WATERS")

Problem Statement There are many waters that fail to meet water quality standards but for which other pollution control requirements or actions are planned or are being implemented that

are expected to provide for standards attainment. Under EPA's guidance, States have the option not to list these waters under §303(d)(1) in specific circumstances. Should the TMDL program treat these waters like other waters not meeting water quality standards or, alternatively, track them elsewhere?

Discussion

The term "expected to meet" is not found in the statute or regulations governing the TMDL process but can be inferred from the regulatory language found at 40 CFR 130.7(b)(1). EPA's 1991 TMDL guidance provides that States may decide not to list water-quality limited waters when the planned controls (as specified in 40 CFR 130.7(b)) are enforceable, specific to the pollution problem, stringent enough to meet water quality standards, and either being implemented or subject to an implementation schedule. EPA's 1993 listing guidance provides further clarification, stating that where needed load reductions are to be attained through additional nonpoint source controls, such controls should be expected to lead to attainment of standards by the next listing cycle. If not, the waterbody should be listed.

The Committee felt strongly that "expected to meet" waters should be tracked carefully for progress toward standards attainment. We were unable to reach agreement, however, on whether States should have the option to exclude "expected to meet" waters from the §303(d)(1) list. Some Committee members supported EPA's current approach (as articulated in the guidance) and felt that it provided a strong incentive to improve water quality while allowing States to take advantage of solutions already established by related regulatory programs.

Other Committee members could support exemptions from listing only if the existing policy is established in regulations and the following details are included:

1. A specific timetable for water quality standards attainment is included; and
2. The exemption is granted only once after a waterbody's initial identification as "expected to meet" and is non-renewable.

3.5 SOURCE CONSTRAINTS AND ACTIONS DURING PERIOD BETWEEN LISTING AND TMDL DEVELOPMENT

Problem Statement

The goal of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. For point sources, this is accomplished primarily through the NPDES permitting program (pursuant to which States/Tribes are to establish individual permit conditions, including effluent limitations, that protect waters from violating water quality standards). For nonpoint sources, this is accomplished through a mixture of regulatory and voluntary and/or incentive-based programs.

Point Sources: Section 302(a) of the Act requires that where a water quality permitting authority determines that "discharges of a pollutant from a point

source...would interfere with the attainment or maintenance of [applicable] water quality standards, effluent limitations (including alternative effluent control strategies) for such point source...shall be established which can reasonably be expected to contribute to the attainment or maintenance of such water quality." To protect waters that do not meet water quality standards from new sources (as defined in regulations at 40 CFR 122.2—included in Appendix F of this report) of problem pollutants, EPA regulations provide (in part) at 40 CFR 122.4(I) that "No new permit may be issued to a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards." For all NPDES permits, including those being reissued, EPA regulations at 40 CFR 122.44(d) require that effluent limitations be included to meet water quality standards and wasteload allocations (see specifically 40 CFR 122.44(d)(1)(vii)(B), in Appendix F). The regulations at 40 CFR 122.44(d)(I) provide that all permits must include "any requirements in addition to or more stringent than promulgated effluent limitation guidelines or standards [under other sections of the Clean Water Act] necessary to achieve water quality standards established under §303 of the Clean Water Act, including State narrative criteria for water quality." Requirements may include zero discharge limitations in certain cases.

Nonpoint Sources: EPA regulations do not address limitations on nonpoint source activities that may cause or contribute to an impairment, although some States may have regulations addressing this situation and Clean Water Act §319 requires that States consider the impact of nonpoint sources on water quality standards attainment and maintenance.

The Role of the TMDL Program: The TMDL program is charged, in part, with effecting impaired waters' rapid recovery and attainment of water quality standards. When the TMDL is established, its provisions implement and, in effect, supplant the point source restrictions and limitations established under the regulations cited above. The TMDL's allocations may limit (and may or may not prohibit) new or increased discharges, so long as it provides for attaining standards by other means. The TMDL may ultimately provide more flexibility than would result from a source-by-source application of existing regulations.

A TMDL for any given water, however, could be scheduled for attention and completion several years after initial §303(d)(1) listing. Do opportunities exist for point/nonpoint source agreement and action during the period between listing and TMDL development when new or additional discharges of problem pollutants from permitted sources are regulatorily prohibited or restricted? Under what conditions, if any, can the point source restrictions set forth, above, be modified or suspended? Should available authorities be used to apply certain similar restrictions to nonpoint sources?

Discussion

In the period between listing and TMDL development, States are now required to implement the restrictions on new or additional discharges that will cause or

contribute to an exceedance of water quality standards. To date, however, States have not always implemented these requirements, nor has EPA generally emphasized the restriction on new sources (as defined in 40 CFR 122.2) contained in 40 CFR 122.4(I). Some Committee members are concerned that enforcing the discharge restriction may in fact encourage development to spread to less-polluted areas with fewer restrictions on land or water use. Others are concerned about the regulation's likely impact on industry and local economies. Some are concerned that the failure to apply the restrictions leads to increased environmental degradation. Our recommendations, below, attempt to provide some flexibility to address these concerns. The Committee strongly believes, however, that the **existing restrictions on new or additional discharges provide sources with a powerful incentive to clean up** the water even before a TMDL is completed and must be actively implemented by the States and enforced by EPA.

In addition to implementing the current regulatory restrictions, environmental management agencies should actively encourage and support stakeholders who want to **stabilize and enhance water quality** before a TMDL is in place. These efforts will be compatible with and should produce results or action plans that could be incorporated into a TMDL for the waterbody. The most successful stakeholder efforts will lead to the full restoration of the water and attainment of water quality standards and ultimately the water's removal from the §303(d)(1) list before a TMDL is developed. Stakeholder leadership during this interim period should not be confused with stakeholder efforts to fund and assist actual TMDL development, however, although stakeholders may play active roles in both of these related efforts. (The second topic of stakeholder participation in TMDL development is discussed in Section 7.2, below.)

▶ Recommendations

1. The Committee recommends that States **fully implement** and EPA **enforce** the current statutory and regulatory **restrictions on new or expanded discharges that will cause or contribute to a water quality standards violation**. The provision at 40 CFR 122.4(I) should continue to be applied to all waters not meeting water quality standards, subject only to the exceptions discussed below.

2. The Committee recommends that EPA issue regulations directing States to **develop watershed characterizations and stabilization plans** for all §303(d)(1)-listed waters.

3. The Committee recommends that the **"watershed characterization"** include, at a minimum, the following information:
   - the condition and/or perceived impairment of the watershed;
   - significant point and nonpoint sources contributing to the impairment; and
   - a listing of remaining data gaps and data sources needed for TMDL development.

4. The Committee recommends that the mandatory **"stabilization plan"** identify and implement applicable State/federal authorities that will prevent further water quality degradation.

5. The Committee recommends that EPA issue regulations also authorizing an additional **optional stabilization plan** to encourage States to work with interested stakeholders to prevent worsening water quality and possibly to begin to move toward standards attainment. The optional stabilization plan would identify mechanisms that might allow for **exceptions from the point source discharge restrictions** (or other applicable interim constraints) upon demonstration that the optional stabilization plan results in parameter-specific net progress in water quality through means other than those restrictions. States (and stakeholders) would also be encouraged to explore and implement additional measures that would lead to or help obtain restoration of water quality. During the optional stabilization planning phase, States must ensure that the public, environmental groups, and resource users have an opportunity to participate in the process. Ultimately, if these measures restore water quality so that water quality standards are attained, the water may be removed from the §303(d)(1) list.

6. The Committee recommends that **unless a water meets water quality standards** as a result of a stabilization effort or is delisted in accordance with the recommendations in Section 3.6 of this report, it will **remain on the schedule for TMDL development**.

3.6 DELISTING

Problem Statement

The Clean Water Act does not directly address the issue of removing waters from the §303(d)(1) list. According to EPA's guidance for the 1994 §303(d)(1) list, States may remove waters when: (1) new information shows that "the original basis for listing is determined to be inaccurate" or (2) EPA has approved a TMDL designed to attain water quality standards. Given the interim constraints that apply to listed waters, sources' (likely) interest in not being located along listed waters, and State agency interest in demonstrating progress in TMDL program activities, when should waters be taken off the §303(d)(1) list? Is the §303(d)(1) list a TMDL to-do list, a list of waters not meeting water quality standards, or something else?

Discussion

Because States may now remove waters not meeting water quality standards from the §303(d)(1) list when the water's TMDL has been approved, the §303(d)(1) list has been historically viewed as a "TMDL to-do list," a list to stimulate prompt TMDL development activities. In its review of this issue, the Committee considered how keeping a water on the list until attainment might speed TMDL implementation (as well as development) and thus further the major objective of §303(d)(1): restoring impaired waters. As well, maintaining the list until attainment allows the States and the public to better monitor implementation and to track progress toward water quality goals.

⊡ Recommendations:

1. The Committee recommends that EPA revise its §303(d)(1) regulations to provide that States may **remove waters from the §303(d)(1) list** only when:
   — the **listed water has attained water quality standards**; or
   — **new information** indicates that "the original basis for listing is determined to be inaccurate" (in other words, the new information indicates that the listed water meets applicable water quality standards).

2. The Committee recommends that states develop a **procedure for submitting listing/delisting petitions** to EPA between listing cycles. The same basic criteria and procedures must be used for listing/delisting waters.

Chapter 4: Scheduling/Priority Ranking/Targeting

BACKGROUND

The Committee considered the statutory and regulatory requirements for priority ranking, targeting, and scheduling and also discussed how these activities might best advance agency workload planning and environmental protection goals. Our review of scheduling, priority ranking, and targeting waters for TMDL attention was influenced by EPA's policy guidance (August 8, 1997) and the specific scheduling requirements in various TMDL lawsuit settlement documents. The following recommendations are intended to help and encourage States and EPA to perform TMDL functions consistently and efficiently.

4.1 OVERALL TIMEFRAME FOR TMDL DEVELOPMENT

Problem Statement

TMDL development has proceeded slowly and few waters have been restored as a result of TMDLs. States will need to carefully plan their activities for maximum efficiency to solve existing impairments. Should a State be encouraged/required to complete TMDLs for all listed waters in a specific number of years? If so, how should that timeframe be determined?

Discussion

During our deliberations, EPA issued a new policy memorandum (August 8, 1997, memorandum from Assistant Administrator for Water Robert Perciasepe to Regional Administrators and Regional Water Division Directors) providing that States should generally set 8-13 year overall schedules for developing TMDLs for waters listed under §303(d)(1) (beginning with the 1998 list). The memorandum included a set of factors that States can use to set longer schedules in exceptional cases.

Setting overall timeframes that include a pace requirement also helps encourage early agency action and informed work planning. The Committee agrees, however, that several important factors can affect the length of the schedule and has worked to identify factors it regards as most important. The Committee also has considered how setting overall schedules can be affected by other TMDL program functions (especially developing implementation plans, which would be a new requirement if the Committee's recommendations are adopted). We generally support the EPA policy recommendation cited above (with slight modification) and recommend that EPA provide additional direction on the pace within the overall schedule of TMDL development, consistent with the following recommendations.

▶ Recommendations

1. The Committee recommends that EPA, by regulation, direct States to **set expeditious timeframes, of not more than 8-15 years, for States to complete their TMDL development**. TMDLs for high priority waters must be submitted to EPA for approval by (a) no later than five years after the State submits its 1998 §303(d)(1) list; and (b) for high priority waters listed for the first time after the 1998 listing cycle, no later than five years after the State firsts submits a §303(d)(1) list identifying

that water. TMDLs for medium priority waters should be completed within eight to ten years of listing; low priority TMDLs should be completed no later than 15 years after initial §303(d)(1) listing. [At the time EPA announced its policy, the Committee concurred with EPA's 8-13 year range for overall TMDL development timeframes. However, because the Committee is recommending that States be required to develop watershed characterization and stabilization plans and to submit implementation plans to EPA, members determined that a two-year extension is appropriate.] (See Section 4.2, below, for a discussion pertaining to setting priorities for TMDL development.)

2. The Committee recommends that absent one of the showings required in recommendation 3, below, EPA **disapprove any TMDL for a high priority water that is not submitted** to EPA for approval **within the deadlines** in recommendation 1, above (i.e., EPA must disapprove the constructive nonsubmission of the TMDL).

3. The Committee recommends that a State may obtain a **one-time extension** for submitting a TMDL for a high priority water to EPA for approval only if the State submits, and EPA approves, a written request demonstrating that the State has made all best efforts to meet the deadline and that the extension is as short as possible and:

   — the TMDL will be completed and submitted to EPA for approval no later than six months after the end of the five-year timeline or will be distributed for review and public comment within two months and will be submitted to EPA for approval within six months after the end of the public comment period; or

   — new information (i.e., information that was not available at the time of listing and priority setting) reveals that the technical assumptions upon which the State was relying to develop the TMDL proved to be incorrect, and that the deadline extension is necessary to rectify the technical problems preventing timely completion of the TMDL; or

   — (a) the waterbody has unique physical or chemical characteristics (e.g., bathymetry, currents, additive and synergistic persistent bioaccumulative toxic pollutants) and a broad spectrum of load contributions from non-NPDES sources, which prevent timely completion of the TMDL; (b) the State has prepared an initial characterization of the waterbody and has developed a workplan with express timelines for development of the TMDL; and (c) at the time of the demonstration to EPA, the State has met each of the timelines in the TMDL workplan.

   The Committee recommends that **EPA not approve extensions that exceed one year** unless the State further demonstrates that despite all best efforts it is not feasible to complete the TMDL within one year.

4. The Committee recommends that overall TMDL development timeframes be **incorporated in the State's Performance Partnership Agreement** and/or other appropriate workplanning agreements with EPA. EPA should monitor State performance to assure milestones and scheduling needs are met and that States are dedicating adequate resources to this effort.

5. The Committee recommends that EPA approve §303(d)(1) lists only if the State's schedule is as expeditious as possible and its **workload is generally distributed proportionately** over the TMDL development schedule. EPA should not accept a schedule in which a disproportionate share of the workload necessary to complete the TMDLs is assigned to the latter portion of the schedule. EPA should further require the State to demonstrate that it has adequate personnel and resources to complete TMDLs according to the proposed schedule.

6. The Committee recommends that a State be allowed to consider the following factors in **determining overall (8-15 year) timeframes**:

   — **number of waters** on the §303(d)(1) list, including
   - number of TMDLs to be completed
   - number of river/shoreline miles; and

   — **complexity of TMDLs** as determined by:
   - number of sources on listed waterbodies;
   - number of different types of sources on listed waterbodies;
   - size and characteristics of the waterbody (e.g., physical complexity, bathymetry, tides, currents);
   - general extent to which other factors (e.g., nonpoint source, remote, or difficult historical contributions) will need to be addressed in TMDLs; and
   - number of jurisdictions involved in the TMDL development process (e.g., as with interstate and international waters).

7. The Committee recommends that, **secondarily**, a State be allowed to **consider** the following factors in determining overall timeframes for TMDL development: **resources** available to develop TMDLs; **availability of suitable data or models**; and interest in/need for extensive public participation.

8. The Committee recommends that States provide opportunities for **public review and comment** on proposed overall timeframes.

4.2 PRIORITY RANKING, TARGETING, AND SCHEDULING

Problem Statement

Currently, priority ranking and targeting decisions are left almost entirely to States' discretion and can be based on a variety of factors. Should priority ranking of listed impaired waters be based on any factors beyond those provided by §303(d)(1)(A): severity of pollution and uses to be made of a listed water? If so, which ones, and under what conditions? If so, how does this affect the statutory requirements? How do priority ranking, targeting, and scheduling individual TMDLs work together?

Discussion

Under §303(d)(1)(A), "States shall establish a **priority ranking** for such [§303(d)(1)-listed] waters, taking into account the severity of pollution and uses to be made of

such waters." **Targeting** is first introduced in 40 CFR 130.7(b)(4) of EPA's regulations, which states that "priority ranking shall specifically include the identification of waters **targeted** for TMDL development in the next two years" and is further developed through later guidance. **Scheduling** individual TMDLs for attention is contemplated by the statute at §303(d)(1)(C) which requires TMDLs to be established for all §303(d)(1) listed waters "in accordance with the priority ranking" and is further articulated in the August 8, 1997 Perciasepe policy memorandum which directs EPA Regions to secure written agreements with States "establishing an appropriate **schedule** for the establishment of TMDLs for all listed waters..., beginning with the 1998 list."

Priority ranking, targeting, and scheduling individual TMDLs for attention are related but not identical activities. The Committee believes that, taken together, these activities should focus agency attention on the 'right waters' at the 'right time.' The Committee is concerned that, in the absence of new, specific guidance, States will not undertake rigorous, logical priority ranking, targeting, and scheduling. At the same time, we are mindful of the importance of State/Tribal flexibility and the many factors that must be considered in planning this complex work.

We conclude that additional guidance on these topics would be valuable to environmental agencies. Such guidance should also direct States to clarify for the public, affected sources, and other stakeholders how individual TMDLs are scheduled and should also recognize that a higher priority water may sometimes be best served by a somewhat longer and fuller development process.

▶ Recommendations

1. The Committee recommends that EPA issue regulations requiring States to **prepare schedules to develop TMDLs** for all waters listed pursuant to §303(d)(1). The regulatory provision should require schedules to be designed so as to ensure completion of all TMDLs within the designated overall timeframe. At the same time, the schedules should be flexible enough to allow States to modify them upon provision of appropriate justification. The scheduling requirement should replace the targeting requirement established by current regulations.

2. The Committee recommends that EPA issue guidance for States on how to conduct **priority ranking and scheduling**, using the **two step process** described below.

   — Step One (To Identify High Priority Waters) (to address the explicit statutory priority factors, "uses to be made of [listed] waters" and "severity of pollution"):

   - **To evaluate the significance of a given use**, assign high priority to waters with demonstrable threats to human health and/or to important native aquatic species. Other uses that may bear secondary consideration (but which should not take precedence over the high priority uses, above) include historical, cultural, economic, and esthetic uses.

- **To determine the severity of the pollution**, consider at a minimum the conditions and types of pollutants present.

— Step Two (For Waters Not in High Priority Group): To promote efficient development of TMDLs and to assure that the overall 8-15 year timeframe requirement is met, consider other factors related to sound environmental management in establishing priority rankings and schedules. States may consider the following factors:

- harm to **point sources** from not having a TMDL in place to allow for increased loads into water quality limited waters, **certainty** for permit shields, and long range planning;
- **imminence of any threat to the environment**;
- **the complexity of correcting the water quality problem** (including the availability of controls; the value of or need for a longer TMDL process to collect more data, identify sources, and/or refine analyses; the degree to which an iterative approach to the TMDL is likely to be needed (e.g., because efficacy of control measures is very uncertain); the number of different types of sources on listed waterbodies; the size and characteristics of the waterbody (e.g., physical complexity, bathymetry, tides, currents); or the number of jurisdictions involved in the TMDL development process (e.g., as with interstate and international waters);
- opportunities to **influence actions or decisions** that will not be open for review or revision over a long (i.e., greater than five-year) term (e.g., with FERC relicensing for dams);
- the ease with which TMDLs could be done for lower priority parameters at the same time as higher priority parameters for the same waterbody; and/or
- opportunities to **"nest" TMDL processes geographically** to more efficiently and effectively advance environmental protection goals, conduct monitoring, identify sources, select solutions, engage the public, and advance implementation.

3. The Committee recommends that EPA require States to **document their priority ranking and scheduling process** (including a discussion of how uses are ranked) and decisions. EPA should review this documentation as part of its review of a State's §303(d)(1) list and priority ranking submittal.

4. The Committee recommends that EPA issue guidance instructing States to make information about their priority ranking and scheduling decisions available **for public review and comment** during the listing process and before such information is submitted to EPA.

Chapter 5: TMDL Development

5.1 INTRODUCTION/REVIEW OF KEY COMPONENTS OF A TMDL

TMDLs must be developed for all waters that States must list under Clean Water Act §303(d)(1). This chapter summarizes Committee recommendations for development of TMDLs, and approval criteria for individual TMDL submissions.

States submit each TMDL to EPA for review and approval. EPA must complete a TMDL if it disapproves a State TMDL submission. Section 303(d) provides that TMDLs are to be developed "at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality."

In general, a TMDL is a quantitative, action-oriented analysis of how to attain water quality standards for waterbodies where standards are not being met. However, there is a need for greater clarity in determining what constitutes an acceptable TMDL, including the appropriate level of quantification, detail, likelihood of attainment, and prescriptiveness. In addition, because TMDLs must be developed for all the many types of impaired waters, there is a need to provide a range of options for tailoring approval criteria to specific situations. At the same time, there is a need for consistency in EPA TMDL approval decisions.

The Committee identified seven necessary components of the TMDL development and implementation process. The content and level of detail required for each component may vary to some extent. The components, described in more detail in Section 5.4, define a TMDL/implementation plan and are used as an organizing framework for this chapter of the report. While the Committee agreed that EPA should require States to complete an implementation plan (component (e) below) for each TMDL, it disagreed on whether the plan should be submitted pursuant to §303(d) or §303(e). (See Section 5.6 below and Appendix H for a discussion of this point.) The necessary components are:

a. **Target identification** (selection of one or more quantified end-points (i.e., a measurable environmental characteristic that indicates compliance with water quality standards), which may include estimating the water's maximum loading capacity);
b. **Identification of current deviation from the target/level of pollution reduction necessary to meet the target** (characterization of how and the extent to which baseline conditions in the waterbody deviate from the target level);
c. **Source identification** (identification of sources that contribute to the impairment);
d. **Allocation of pollution loads (or alternative providing an equivalent demonstration of attainability of standards)** (includes assignment of control responsibility among sources of the impairment);
e. **Implementation plan** (the Committee did not agree on whether this would be part of the TMDL or submitted to EPA separately under §303(e), but did agree the plan should be prepared concurrently with the TMDL and include the plan and schedule for implementation of control or restoration activities to eliminate the impairment and for carrying out TMDL components (f) and (g));
f. **Process for monitoring/assessment of effectiveness** (provisions for evaluating the TMDL's effectiveness in achieving attainment of water quality standards); and
g. **Process for TMDL revision** (provisions for modifying and/or revising the TMDL based on monitoring/assessment of effectiveness).

Some of these components of the TMDL and implementation plan have been described in EPA guidance and/or are part of EPA's existing TMDL approval criteria. However, some of the components—such as the implementation plan and the provisions on evaluation and revision where necessary—are new.

Actual implementation of the TMDL—as specified in the implementation plan and schedule—should begin immediately following the TMDL's approval by EPA.

5.2 MODELING ISSUES/DATA NEEDS/UNCERTAINTY

Problem Statement

Many aspects of TMDL development can involve uncertainty due to limited data or knowledge. What improvements in data gathering and modeling capabilities are most needed to ensure TMDLs are developed to ensure elimination of water quality impairments?

Discussion

Several steps in TMDL development and implementation planning may require data gathering and the use of predictive water quality models. For example, the following information needs are often associated with the first six components (a-f) described above in Section 5.1:

COMPONENT	MODELING/DATA/ASSUMPTIONS NEEDED TO:
a. Target Identification	- Develop numeric target for water quality conditions (e.g., criterion) - Translate criterion to numeric loading capacity level (quantified pollution load from all sources, including background, necessary to meet criterion, e.g., through a predictive analysis of pollution in the waterbody)
b. Deviation from Target	- Quantify the amount and timeframe of deviation between current/future loading levels and the loading capacity level
c. Source Identification	- Identify all sources or source categories - Quantify the amount of load from sources, including natural background
d. Allocation of Pollution Loads	- Ensure that allocations will lead to attainment of water quality standards
e. Implementation Planning	- Estimate the effectiveness of controls/management measures - Determine that controls/management measures are sufficient to achieve the TMDL allocations - Determine the likelihood of actual implementation of control strategies
f. Monitoring/ evaluation	- Assess whether the implementation of controls/management measures has occurred - Evaluate the effectiveness of controls/management measures, and whether they are meeting allocations - Demonstrate attainment of water quality standards

Although some minimum, reasonable amount of data and information are necessary to develop a TMDL, lack of certainty should not delay TMDL development. A starting point would be the data and information that were used to support the decision to list the water under §303(d)(1). However, many TMDLs may require additional data and/or modeling capability, to reduce uncertainty associated with each necessary analytic step. The Committee recognizes that TMDL development has been inhibited by inadequate data collection, incompatible data from different sources, failure to collect necessary flow and water quality data concurrently, failure to collect data on sources and on uses, failure to follow proper analytic techniques in collecting data, and inadequate models. Future data collection and model use and development should be increased, improved, and coordinated to minimize or eliminate these difficulties.

In general, we believe our recommendations on data and information needs are consistent with previously issued EPA guidance or current practice. However, the detail and scope of the Committee's recommendations on this topic reflect our concern that progress must continue in the areas of data gathering and analysis and modeling capabilities to ensure a strong and effective TMDL program.

▶ Recommendations

1. The Committee recommends that EPA determine what changes in the type and extent of State and national **monitoring activity** are most needed to support TMDL development. For example, additional monitoring may be necessary to identify sources of impairment (including natural background), meet model input requirements, and evaluate control actions called for by a TMDL.

2. The Committee recommends that EPA and States undertake efforts, including issuance of EPA **guidance on State monitoring** program adequacy, to ensure that the type and quality of data collection by State/federal agencies, local governments, stakeholders, and citizens conforms to water quality standards and TMDL development needs.

3. The Committee recommends that EPA investment in better **modeling** capabilities for TMDL development be one of its highest TMDL program priorities. EPA should put relatively more effort into improving existing models and their application (providing guidance on how to use them and making them easier to use) than into developing new models, although both are very important.

4. The Committee recommends that EPA particularly support the development and/or appropriate application of **models** to assist in TMDL development for waters where **wet weather** flow conditions (e.g., stormwater runoff from fields, buildings, and streets) are likely to influence the cause and nature of impairments, as well as the potential solutions to the impairment.

5. The Committee recommends that, consistent with current EPA practice, States shall consider and use as appropriate all existing and readily available reliable data and information, e.g., data collected consistent with a State agency's minimum data requirements and/or its QA/QC

program. Although some data gathering may be necessary early on in the process, lack of certainty must not delay TMDL development. Data requirements for TMDL development cannot be prescribed generally, but depend upon the needs of each TMDL. The **following factors affect how much data are necessary** for development of a TMDL:

— **the extent of follow-up monitoring** called for by the TMDL: although some minimum, reasonable amount of data are necessary, relatively less data may be necessary prior to TMDL development if the TMDL has relatively stronger follow-up monitoring/evaluation and revision provisions, as long as the TMDL meets approval criteria;

— the potential **impact on the environment**: cases where there are significant or potentially irreversible costs to the environment/beneficial uses, such as threats to human health or endangered species, may require (in addition to immediate action) more data gathering throughout the TMDL development and implementation process to ensure the TMDL is effective;

— the potential **impact on sources**: TMDLs that are likely to lead to relatively more costly implementation measures may warrant more data gathering; and

— **data needs of models** and other tools necessary to develop an approvable and scientifically defensible TMDL.

6. The Committee recommends that EPA evaluate and develop **simpler reliable analytical techniques** that require fewer data to help initiate TMDL development. In some cases, these techniques may be sufficient to develop the TMDL; in others, these techniques could help focus additional, more intensive data gathering and modeling efforts.

7. The Committee recommends that EPA and States help meet the **need for data** to develop TMDLs by:

— encouraging or initiating **early efforts** to gather and compile data, prior to scheduled TMDL development;

— **clarifying** the type, amount, and format of data for models likely to be used in developing the TMDL (e.g., water quality coupled with flow data);

— **developing work plans cooperatively** to ensure that adequate data and information are gathered;

— using relevant data collected by **other agencies** (e.g., Census of Agriculture and Natural Resource Inventory, USGS monitoring, data collected by land management agencies); and

— entering into **agreements** (such as Memoranda of Agreement) with other data-gathering agencies and other entities so that data and information useful in TMDL development can be acquired in a timely manner.

5.3 GEOGRAPHIC SCOPE

Problem Statement

The geographic scope of waterbodies listed under §303(d) varies from relatively short stream segments to longer waterbodies. In some cases, several segments within a single watershed are listed. How should States and/or EPA determine geographic scope in developing TMDLs?

Discussion

The geographic scope of a TMDL will vary considerably with the scope of the problem to be addressed and the location of sources that contribute to the problem. Thus, TMDLs may vary in scope from basin-wide programs (such as the entire Columbia River basin) to the watershed of small headwater streams, to individual stream segments contaminated by a particular pollutant discharged by a limited number of sources. Thus, there can be no fixed rules regarding the appropriate size or scope of a TMDL, and waterbodies may still be identified by segment in the listing process. At the same time, however, it is critical to the success of individual TMDLs and the program as a whole that TMDLs be defined according to appropriate size and scope. In this regard, legitimate concerns might be raised at both ends of the spectrum, i.e., a particular TMDL might be either too large or too small to be effective.

A TMDL might be too large if its size and complexity precludes meaningful monitoring, evaluation, and implementation. However, some water quality problems are characterized by large geographic scale, in terms of both the size of the area in which the problems exist and the geographic range of the sources of the problem. (Nutrient enrichment of the Chesapeake Bay and oxygen depletion in the Gulf of Mexico are examples of this phenomenon.) This problem has been addressed in many watershed programs through the concept of "nesting," in which the entire affected watershed is analyzed in an umbrella program, but the program is divided into a series of nested programs at smaller, more manageable scales for purposes of monitoring, source identification, identification and implementation of solutions, and participation by contributing sources and the public. By contrast, a TMDL might be too small if its geographic scope is defined so narrowly that the entire problem area is not included in the analysis, and in particular if all sources contributing to the problem are not identified and addressed. The issue is complicated by the fact that the geographic range in which water quality problems occur may be different from the geographic range in which contributing sources exist. (For example, the problems may exist predominantly downstream from the areas in which the contributing sources exist.)

▶ Recommendations

1. The Committee recommends that EPA include in its revised regulations **basic principles defining the appropriate size** of TMDLs under various circumstances. The rules should establish the following requirements:

   — The TMDL must **identify fully the geographic range** of the waterbody in which **the water quality problem occurs**. Where existing monitoring is not adequate to define the geographic scope of the problem, additional monitoring and assessment must be conducted during TMDL development in order to delineate the scope of affected waters fully.

   — The TMDL must **identify fully the geographic range** of the watershed or watersheds in which all **significant sources** that contribute to the problem exist, so that all such sources can be included in the pollution load allocation process. Where existing information is not adequate to define the geographic scope of the contributing sources, additional analysis must be conducted during TMDL development in order to identify the geographic range of all contributing sources.

   — Where the size of the affected watersheds or area of source contribution is too large, so that monitoring, source identification, identification and selection of solutions, public participation and implementation cannot be conducted efficiently, the **TMDL process may be "nested"** such that appropriate monitoring, public participation, and implementation is conducted at the appropriate geographic scale.

   — Where the affected watershed crosses jurisdictional lines, some mechanism must be used to ensure **all responsible decision-makers** participate in the TMDL development process. In cases where the watershed crosses international boundaries, representatives from the affected countries should be encouraged to participate.

   — Where possible, **georeferencing techniques** should be used to make the scope of the TMDL available to all affected stakeholders.

5.4 CRITERIA FOR APPROVAL

Problem Statement

Due to limitations of science and resources, it is impossible to eliminate all uncertainty associated with the development of TMDLs, although the degree of uncertainty will vary. Moreover, impaired waters differ according to how the impairment is characterized (e.g., failure to meet numeric or narrative water quality criteria); causes of impairment (e.g., current or past loading, point or nonpoint sources), and optimum solutions for eliminating the impairment. What should guide TMDL development and EPA approval decisions to provide for: (1) TMDL development in the face of uncertainty; (2) needed flexibility to meet different types

of impairments; and (3) confidence that the TMDL will successfully eliminate the impairment in a timely fashion?

Discussion

The Committee recognizes that:

— **progress** in TMDL development (and implementation) **must be made** despite uncertainties that will exist;

— TMDL approval criteria must address a fundamental problem—that different aspects of **TMDLs vary** in the degree to which loads can be **rigorously quantified** (for example: failures to support narrative criteria may not be easily quantified (although surrogate measures may help); source contributions (in particular, those of nonpoint sources) may not be well known; and pollution fate and transport may be difficult to determine);

— approval criteria must address a variety of **different types** of water quality **impairments**, such as problems caused by excessive ongoing pollution loading, past pollution loading, modifications to flow, and/or habitat alteration;

— **quantitative rigor** and accurate, thorough data are desirable, and the best available science should always be applied;

— TMDLs need to have **follow-up monitoring**/evaluation provisions and built-in corrective mechanisms (feedback loops), to ensure that actions called for during development of the TMDL and/or its implementation are effective at meeting water quality standards and that public and private resources are not wasted;

— TMDL approval decisions should be as **objective and consistent** as possible, even though some degree of subjectivity and judgment will be necessary; and

— TMDL approval criteria should be as **straightforward** and as easy to apply as they can be.

Based on these considerations, the Committee recommends that EPA and the States use a "hierarchy approach" to TMDL development and approval. Key aspects of this approach are outlined in the recommendations below; a more detailed description, along with examples of how the approach might be applied, appear in Appendix G.

The Committee's recommendations broaden the scope of the TMDL development process to include implementation planning and follow-up monitoring, and clarify that TMDLs may be expressed in terms other than daily loads. The Committee agreed that an implementation plan must be prepared and submitted to EPA for each

TMDL but did not agree on whether the implementation plan should be part of the TMDL under §303(d) or submitted pursuant to §303(d) or §303(e). (See Section 5.6 below, and Appendix H.) In other respects, the Committee's recommendations for what constitutes an approvable TMDL are probably consistent with EPA's current TMDL policies. However, we believe our recommendations would help make TMDL approval criteria more explicit, thus providing greater clarity on how TMDLs are to be developed and reviewed for approval/disapproval with objectivity and consistency.

▶ Recommendations

1. The Committee recommends that EPA **issue regulations and guidance requiring that, to be approvable, each TMDL submittal must include the interrelated components listed below**. The specific content and detail associated with each component could vary among TMDLs. EPA should base its approval decisions on whether, taken together, the "package" of TMDL components is deemed likely to lead to attainment of water quality standards. The components include:

   a. **Target identification**: determining the pollution of concern, and quantifying the target (or desired end-point(s)) of the TMDL process);

   b. **Identification of current deviation from the target**: quantifying the degree to which conditions in the waterbody deviate from the desired target, and the pollution load that must be reduced to meet the target;

   c. **Source identification**: identifying the responsible sources, or categories of sources, of the pollution of concern, and quantifying the degree to which each source (or source category) contributes to the problem;

   d. **Allocation of pollution loads**: setting quantified pollution reduction responsibilities among the identified sources, along with a quantified margin of safety, any allocation for future growth, seasonal variations, and, if necessary, other factors to address variable flow conditions;

   e. **Implementation plan**: specifying and quantifying control actions and implementation tools, methods, and authorities that will be used to achieve the allocations and eliminate the impairment, in addition to schedules and milestones for implementing the called-for actions, evaluating the TMDL (see (f) below), and correcting the TMDL (see (g) below) if the TMDL is found to be ineffective (see Appendix H for a discussion of the unresolved issues concerning EPA review of the implementation plan);

   f. **Process for follow-up monitoring and assessment of effectiveness**: determining the degree of use attainment, remaining variance from the target, compliance with implementation plan, and the accuracy of sources and source contributions identified in the TMDL; and

g. **Process for TMDL revision**: describing how the TMDL will be modified and/or revised to ensure water quality standards are met, in response to follow-up monitoring and evaluation results.

2. The Committee recommends that **the highest level of quantitative rigor currently available always be applied to components a-d**. If the highest level of quantitative rigor is not feasible (due to lack of data or information), the "next best" level of quantification should be applied (however, the best available scientific rigor should always be applied). This **"hierarchy approach"** allows TMDLs to be developed that will meet water quality standards for all §303(d)-listed waters, despite the fact that TMDLs may vary in the degree to which they can be quantified. (See Appendix G for examples of how the hierarchy approach could be applied.)

3. The Committee recommends that **EPA apply a principle of "inverse proportionality" in determining the degree of rigor or specificity needed in various TMDL components.** For TMDLs that contain relatively less rigor in components a-d, relatively more specificity or rigor is needed in components e through g, although some minimum, reasonable degree of quantitative rigor is necessary to support a finding that the TMDL will lead to attainment and progress can be measured. For example, TMDLs that contain less quantitative rigor in the target identification component must contain a higher degree of implementation specificity, and more frequent/detailed provisions for follow-up evaluation and potential revision. All implementation plans must be sufficiently detailed to lead to attainment of water quality standards.

4. The Committee recommends that **when data or scientific information alone are insufficient to determine a course of action, EPA and the States use "best professional judgment" in developing TMDLs.** States and EPA should clarify the role of best professional judgment in making assumptions necessary for TMDL development, and ensure that "best professional judgment" is exercised by trained and experienced professionals, based on the best available science and data. EPA should require that assumptions are documented and submitted as part of the TMDL. Some minimum or reasonable amount of data and information should be required for each TMDL, and EPA should define this level where possible. A TMDL developed with greater reliance on "best professional judgment" should include relatively more provisions for follow-up evaluation and revision.

5. The Committee recommends that **EPA and States provide clear information to the public (all stakeholders) about the use of "best professional judgment" in TMDL development early on in the process, to promote more stakeholder acceptance and commitment**. TMDLs developed using a high degree of "best professional judgment" may require additional public education/outreach efforts. The public should have an opportunity to provide information to assist State/EPA best professional judgment decisions.

6. The Committee recommends that **in some instances** (e.g., when the impairment is tied to a pollutant for which a numeric criterion is not possible or when an impairment cannot be tied to a single pollutant), **EPA and the States use surrogate measures in TMDL development**. Surrogate measures may include numeric environmental indicators other than numeric criteria for targets (component a) and quantified measures other than pollution loads for allocations (component d).

If surrogate measures are used, a higher degree of implementation specificity and stronger procedures for follow-up monitoring and evaluation may be required. In the same manner as other TMDLs, TMDLs with surrogate measures should guide actions (regulatory and/or voluntary) necessary to achieve water quality standards. EPA and the States should also ensure that surrogate measures are tied to the water quality standard, and, when implemented, will lead to attainment of the water quality standard.

7. The Committee recommends that EPA support (in regulation, guidance, and/or a policy statement) the concept that, in some instances, the quantified allocation of pollution may be expressed using units of measure **other than daily loads**. The regulation, guidance, or policy statement should identify the types of situations in which such alternative units are appropriate (such as where impairments are significantly affected by storm-driven flows and may need to conform to accepted models that use longer than daily temporal units). The use of such alternative units must be supported, where appropriate, by a showing that the resulting allocations are sufficient to eliminate the impairment, addressing all aspects of the water quality standard and the full adverse effects of the pollutant in question (for example, where appropriate, the difference between acute short-term impacts during storm flows and long-range effects of the pollutants in the system over time, or the difference between short-term changes in water column concentrations and the long-range impacts of pollutant concentrations in sediments and biota). Resulting load allocations and follow-up monitoring should be tailored to the appropriate time-scales for each relevant set of health or environmental impacts, and, where appropriate, for the models used to develop the TMDL.

8. The Committee recommends that **the statutorily-prescribed "margin of safety" (MOS) be included in the TMDL allocation.** The MOS should address modeling uncertainties associated with relating loads to water quality conditions. However, States should not view the MOS as a substitute for basic data and rigor in TMDL development (i.e., the MOS is not subject to the "inverse proportionality" principle). Consistent with the hierarchy approach, the best available science should always be used.

9. The Committee recommends that **EPA develop guidance and tools to enable the hierarchy approach as described above (and in Appendix G) to be easily applied in actual TMDL development and approval decisions**. EPA should consider devising a practical tool, such as a template, flowchart, or interactive computer program to assist States in developing TMDLs.

10. The Committee recommends that **EPA support pilot projects that illustrate model approaches** to TMDL development/implementation planning (for example, on useful surrogate measures) and disseminate information generated from these projects to States.

5.5 THE ALLOCATION PROCESS

Problem Statement

Allocating load reduction responsibilities among sources is an important and difficult part of the TMDL development process. Allocation decisions are often contentious, given that allocation decisions determine implementation

responsibilities and impose costs on sources. While the allocation scheme must achieve the TMDL and attain water quality standards, many other factors may influence States' allocation decisions, such as concerns for equity, cost-effectiveness, enforceability, and technological feasibility. In addition, difficult questions must be addressed when making allocation decisions such as whether and how to make an allocation for future growth. Given the difficulty of making allocation decisions, what, if anything, should EPA do to assist States? Are there particular allocation principles that EPA should promote?

Discussion

The Committee is most concerned that TMDL allocations be sufficient to meet water quality standards. The TMDL implementation plan must include assurances that allocations will be met, and specify how they will be met. The Committee generally concluded that a variety of approaches to allocations are legitimate and that it is important to provide flexibility for States to use the method that is most likely to work best in a given watershed. The Committee identified several general principles it believes EPA should convey to States as appropriate considerations in making allocation decisions. EPA and States may currently consider these principles in developing TMDLs, but this may not be consistently done. The Committee noted that States (and stakeholder groups) may not always be aware of the different methods that have been successfully used. (It should be noted that the Committee's recommendations on allocation are not intended to affect and do not address jurisdictional issues among States, Tribes, and EPA.)

⊡ Recommendations

1. The Committee recommends that EPA convey (through guidance) the following **principles** to assist States in making allocation decisions.

   — To be approvable, a TMDL's allocation scheme **must be designed to achieve water quality standards**. The TMDL implementation plan must clearly demonstrate how the allocation is to be achieved.

   — EPA should encourage States, within a watershed framework, to determine an **equitable allocation** of pollution control responsibilities, as long as it is clear that the allocation will achieve water quality standards. In this framework, States (with input from stakeholders) may consider several factors including technical and programmatic feasibility, cost-effectiveness, relative source contributions, and the degree of certainty of implementation (including the "reasonable assurances" in the implementation plan (see Section 5.6 below, recommendation 2.d), past experience with similar approaches, and enforceability of point and nonpoint source controls).

   — Although an **allocation for future growth** is not required, States should always consider including future growth in allocations, and document their decisions. The documentation should clearly explain to sources the implications of the growth allocation decision, especially if there is no allocation for growth.

— States may consider **innovative approaches** when making allocation decisions, if (1) the TMDL implementation plan provides reasonable assurances that allocations will be achieved and water quality standards met when using the approach; (2) all legal requirements associated with the allocation process (and the TMDL process in general) are met; and (3) the TMDL implementation plan contains detailed, specific provisions for follow-up evaluation of the innovative approach, and potential revision or elimination of the innovative approach in favor of a more traditional approach based on that review.

2. The Committee recommends that EPA distribute **"informational guidance" on allocation methods** that have been successfully used, to assist States and stakeholder groups devise an appropriate and effective allocation scheme for specific circumstances. The guidance might include: clarification of purpose and legal requirements of the allocation process; case studies of different allocation approaches; information needs for different allocation approaches; and "process" suggestions, such as effective negotiation methods and ways to involve stakeholders. The informational guidance should allow States to review alternative allocation methods, compare them with their particular objectives, and choose the best method for the watershed to attain water quality standards.

5.6 THE IMPLEMENTATION PLAN

Problem Statement

The Clean Water Act does not expressly specify whether implementation plans are required as part of a TMDL submission, although §303(e) requires approved TMDLs to become part of a State Continuing Planning Process (CPP). EPA's practice in the past has not required implementation plans be part of State TMDL submissions. However, some State CPPs have not been addressed for two decades while others are more actively applied. Given that TMDL development will lead to attainment of water quality standards — one of the ultimate goals of the Clean Water Act—only if TMDLs are actually implemented, should EPA require implementation plans for individual TMDLs?

Discussion

Since the purpose of a TMDL is to bring about attainment of water quality standards, the mandates of the Clean Water Act will be thwarted and resources will be wasted if TMDLs are completed but not implemented. Because the goal of the TMDL program is to correct impairments and achieve beneficial uses of our nation's waters, and the purpose of individual TMDLs is to clean up specific impaired waters, States and EPA need to address implementation effectively at the time of TMDL development.

Committee members disagreed on whether the implementation plan should be required under Section 303(d) (as part of the TMDL) or under the State's Continuing Planning Process under Section 303(e). (The Committee's brief analysis of these alternative approaches is discussed in Appendix H). The Committee did agree that, under the Clean Water Act, an implementation plan could be required by EPA.

▶ Recommendations

1. The Committee recommends that EPA issue regulations requiring that an **implementation plan and schedule** be prepared and submitted to EPA **with each TMDL**. The schedule specified in the implementation plan should provide that implementation activities will begin immediately after EPA approval of the TMDL to ensure water quality standards are met as soon as possible, and to avoid the TMDL*'s* becoming outdated or "stale" before being used to guide control efforts. The implementation plan would be based on the TMDL that has been developed, including allocations, background pollutant levels, and geographic boundaries. States should be held accountable for developing implementation plans under the Clean Water Act to help ensure that implementation gets high priority, that water quality problems are being addressed, and that the goals of the Clean Water Act will be met. If EPA decides that the implementation plan requirement should be under §303(e), then EPA's CPP regulations need to be updated and improved. Even if EPA does not rely on §303(e) to require implementation planning, the Committee would recommend a review and possible revision to the CPP regulations.

2. The Committee recommends that EPA issue regulations requiring that each TMDL **implementation plan** contain all nine of the **components** described below. However, the level of detail associated with each component may vary among TMDLs, depending upon the complexity of the TMDL and other factors, as provided in the hierarchy approach (see Appendix G).

   a. **Description of actions (control actions and/or management measures) that will be implemented to achieve the TMDL.** The description contained in each TMDL may vary depending upon the complexity of the problem and control actions, but at a minimum the description must include:

      For point sources: a list of NPDES permits and corresponding wasteload allocations, (details of how wasteload allocations will be achieved can be worked out in the permits as they are written and/or revised), and the schedule for revision of these permits, if necessary, to incorporate the TMDL allocations.

      For nonpoint sources (see also Section 5.8 below for a discussion of approaches to nonpoint source implementation planning): load allocation(s) (or an alternative providing equivalent demonstration of attainability of water quality standards), and a description of management practices or measures/control actions, including:

      - **who** must undertake the management practices/measures or control actions (identified parties could include either individual sources or logical groupings of sources, as the State determines is most appropriate to guide implementation of the particular TMDL);

      - **what** actions identified sources must take to meet their allocations (including an assessment of the anticipated effectiveness of the actions, how the actions would be expected to achieve the TMDL allocations, and what additional actions may be needed);

- **when** those actions must be implemented (including any seasonal variations); and

- **where** the actions apply (the geographic boundaries for sources and control actions/management measures).

In regard to **nonpoint source management measure or control action descriptions**, it should be noted that:

- Nonpoint source actions can include **voluntary, incentive-based measures** as well as regulatory controls, and "bad actor" provisions. However, for voluntary and/or incentive-based measures, the assumptions the State uses to provide "reasonable assurances" must be specified (see 2.d below).

- If nonpoint source actions are already described by an **existing program** (e.g., Coastal Nonpoint Pollution Control Program), then the description of those actions could be referenced and attached to the submittal along with a description of how and when these actions will be implemented and are expected to meet the allocation in the TMDL (see Section 8.1, Recommendation 7). If existing programs have already been implemented and nonattainment continues, this approach alone would be inadequate.

- The hierarchy approach to TMDL development and approval should inform the **level of detail** needed to describe nonpoint source actions and follow-up monitoring activities. For example, implementation plans for TMDLs that rely on a set of quantifiable actions because quantifiable target and load allocations are not available would require much more detailed specificity on those planned actions (see case #4 under Step 1 of the hierarchy approach description, Appendix G).

b. **A schedule for implementing specific activities** (management measures, control actions, and other follow-up activities) deemed necessary to achieve the TMDL. This schedule addresses source activities as well as activities expected from the State/EPA, such as certain follow-up monitoring or evaluation activities. This should include:

- A schedule for issuing new and/or revising existing applicable NPDES **permits**;

- A schedule for implementing (and, if necessary, developing) **nonpoint source management measures and/or control actions**. The schedule should call for such activities to begin immediately after approval of the TMDL (i.e., the schedule cannot delay all implementation activity until some point in the future);

- A schedule for completion of the **milestones** for management measures/control actions (see component g);

- The **estimated timeframe** for control action/management measure effectiveness in meeting water quality standards (see component f); and

- A schedule for **revising the TMDL** in the event revisions should prove to be necessary (see component h)

c. The **legal authorities** under which the control actions will be carried out (for example, Clean Water Act NPDES permitting requirements, Clean Water Act §401 Certification, Federal Land Policy and Management Act §202, CZARA, State forest practices acts, State water laws, State nonpoint source management programs, and/or watershed management plans) and whether those actions are enforceable. The plan should also include information on how the specified authorities will be used and enforced, and by whom.

d. **"Reasonable assurances"**:

(1) That **nonenforceable actions** (for certain nonpoint source activities) will result in the load allocations for nonpoint sources required by the TMDL. This would, at a minimum, include:

- demonstration of the **availability of funds** to implement the nonenforceable actions;

- description of the process for entering into any necessary **agreements** (such as with/among various federal, Tribal, State, and local agencies/entities, private landowners, others) to carry out such nonenforceable actions and the probability of success in achieving such agreements;

- an assessment of the **likelihood of continuation of governmental programs** (e.g., Conservation Reserve Program) that are planned to assist in implementation; and

- an analysis of the **anticipated effectiveness of the management measures** (a demonstration of how, if implemented, they will actually lead to desired reductions; an evaluation of the success of existing/prior programs calling for similar controls in the watershed or a similar watershed may be used in this analysis).

(2) That adequate funding for planned **point source controls** (e.g., planned POTW upgrades) is expected to be available.

e. **An estimate of the time required to attain applicable water quality standards and a demonstration that the standards will be met as expeditiously as practicable.** It would be expected that actions called for to implement the TMDL would begin immediately after approval of the TMDL submittal.

f. **A monitoring plan** designed to determine the effectiveness of the implementing actions and whether allocations were met. This plan must include at least the following components:

- a plan for assessing whether management measures/control actions are being implemented as planned;
- a plan for assessing whether allocations are sufficient to attain water quality standards;
- a plan for assessing the improvement in water quality conditions (reflecting time necessary to ensure that water quality standards are met);
- a plan for assessing whether the milestones described in component (g) are being met; and
- a plan for assessing the effectiveness of management measures/control actions.

In addition, the implementation plan/schedule should indicate who will carry out (and pay for) the monitoring activities.

g. **Measurable milestones** for determining whether the implementation plan is being properly executed, and for determining whether applicable water quality standards are being achieved. While the milestones selected may vary depending upon what is most appropriate for the particular TMDL to be implemented, they must be sufficient to demonstrate adherence to the implementation plan. The measurable milestones must include:

- appropriate incremental, measurable water quality targets to ensure that progress is being made (associated with the periodic monitoring called for in the monitoring plan (component f)); and
- milestones for implementing control actions, for example:
  - the number of permits to be modified by a date certain; and
  - a quantifiable measure of the nonpoint source actions implemented by a date certain (which, depending upon the situation, could be an estimate of the number of specific control actions taken, the number of farms adopting management measures, acres of forests adopting certain management practices, or other measure suitable to demonstrate on-the-ground implementation).

h. **The ramifications of failing to meet these milestones.** The ramifications (i.e., what happens next) depend on why the milestones are not being achieved and the degree to which the milestones have not been met. The ramifications should explain the TMDL corrective mechanism, including how and when it would be necessary for the State to

modify each component of the TMDL (allocations, point or nonpoint source control actions/management measures in the implementation plan, monitoring plan, etc.), and when it may be appropriate to "re-open" or re-submit the TMDL.

i. **A schedule for revising (and submitting to EPA for approval) the State's CPP and applicable (preferably sub-basin) Water Quality Management Plans** to include the TMDL, and the proposed Water Quality Plan Revision. (The schedule for revising the CPP and Water Quality Management Plan is more important if the implementation plan is carried out through §303(e)*;* see Appendix H.) A State may be able to combine several TMDLs in a CPP and WQMP revision.

5.7 DEADLINES FOR ATTAINMENT

Problem Statement

TMDLs (with their associated implementation plans) are designed to lead to attainment of water quality standards. Should EPA establish a deadline for TMDLs to attain water quality standards?

Discussion

The Committee agrees that TMDLs should be designed and implemented with a goal of expeditiously attaining compliance with water quality standards. The Committee could not agree, however, whether to recommend establishing a specific deadline for attainment, either programmatically or with respect to individual TMDLs.

The Committee has stated that its primary interest is in “expeditiously eliminating water quality impairments” (see Section 2.2). The Committee has recommended that TMDL implementation plans include “an estimate of the time required to attain applicable water quality standards and a demonstration that the standards will be met as expeditiously as practicable,” “measurable milestones,” and “provisions for follow-up monitoring, evaluation and potential revision” (see Section 5.6, above).

Some members of the Committee wanted to recommend that EPA revise its regulations to require specific deadlines for attainment as a condition of EPA approval of individual TMDLs submitted by States, including a demonstration that the proposed deadline is as expeditious as practicable. This requirement would apply whether the implementation plan were part of the TMDL or not.

Other members of the Committee agreed with the existing language in the report regarding expeditious attainment but did not agree that specific regulatory deadlines should apply to each TMDL.

5.8 NONPOINT SOURCE APPROACHES

Problem Statement

Historically, nonpoint sources have not been regulated as comprehensively as point sources and the water quality programs for point and nonpoint sources differ in a

variety of ways. Point source permits must reflect TMDL wasteload allocations. How are pollution reduction actions for nonpoint sources to be addressed in TMDLs?

Discussion

Nonpoint sources (both urban and rural) cause or contribute to impairments in waterbodies throughout the United States. State surveys indicate that nonpoint sources are significant and widespread contributors of pollution to impaired waters.

All members agree that waters impaired by both point and nonpoint sources should be listed under §303(d)(1)(A) of the Clean Water Act and have TMDLs prepared for them. In addition, all members agree that any water not meeting water quality standards due entirely or in part to nonpoint source contributions should be assigned priority for attention under §319 State Nonpoint Source Management Programs and that their attainment/nonattainment status should be tracked and made public. The Committee recognizes that there are legal issues that have been raised as to whether waters impacted only by nonpoint sources are to be listed under §303(d)(1)(A), §303(d)(3), or only under §319. However, the Committee has decided not to address these legal issues in its report.

▶ Recommendations

1. The Committee recommends that load allocations for nonpoint sources be established and implemented according to the principles set out elsewhere in this report (including, most specifically, "Criteria for Approval" (5.4), "The Implementation Plan" (5.6), "Tracking and Assessing TMDL Effectiveness; the Importance of an Iterative or Adaptive Approach" (5.9); and the related "Outline of the Hierarchy Approach to TMDL Approval" (Appendix G)). Under these principles, the combination of **best management practices** and any requirements of State and federal law for nonpoint sources, **along with** existing and new **controls adopted by point sources** (where appropriate), are to be sufficient to **meet water quality standards**. In accordance with §319(a)(1)(C) of the Clean Water Act, States should identify best management practices and measures to control **nonpoint sources** causing or contributing to nonattainment of water quality standards, and provide for these sources to **reduce, to the maximum extent practicable**, the level of pollution they contribute. (See also Section 10.1 for recommendations on the responsibilities of federal land managers in assuring the adequacy of TMDL implementation plans for lands within their jurisdiction.)

2. The Committee recommends that, as described in the Sections of this report referenced above, if the initial combination of controls established in the TMDL implementation plan produces less water quality improvement than expected, States **modify the TMDL** and/or its implementation plan **to assure that the goals will be met.** In developing the revised TMDL and/or plan, States shall review existing point source permit control requirements for compliance and/or necessary modifications and also shall:

a. review the best management practices and measures they previously identified for nonpoint sources and revise them as necessary to assure that they continue to produce the maximum practicable pollution reduction;

b. identify any additional nonpoint sources (or classes of nonpoint sources) that should participate in achieving the TMDL's goals;

c. identify any additional management measures and/or controls that, to the maximum extent practicable, will reduce the pollution of concern from nonpoint sources in the affected water; and

d. exercise any additional legal authorities to address nonpoint sources, as necessary.

3. The Committee recommends that, in reviewing and approving TMDLs, **EPA** assure that the combination of load/wasteload allocations is designed to result in water quality standards attainment and disapprove any TMDL that is not expected to provide for attainment. However, it is the **State**'s responsibility to determine what nonpoint source best management practices and measures are to be included in the implementation plan and which of these practices and measures are to be regulatory, nonregulatory, incentive-based and/or voluntary. (See Section 10.1 for recommendations on the responsibilities of federal land managers in assuring the adequacy of TMDL implementation plans for lands within their jurisdiction.)

5.9 TRACKING AND ASSESSING TMDL EFFECTIVENESS; THE IMPORTANCE OF AN ITERATIVE OR ADAPTIVE APPROACH

Problem Statement

Following TMDL development and approval, information may become available suggesting that TMDL targets, load allocations, or planned implementation strategies need to be refined to ensure the TMDL will achieve water quality standards. In addition, although many TMDLs can be developed with confidence based on available data and scientific understanding, some may need to be developed where there is considerable uncertainty about sources, causes of impairments, or other relevant factors. EPA's current guidance allows a "phased approach" to TMDL development in cases of significant uncertainty. TMDLs developed using the phased approach must include all EPA required elements and be designed to lead to water quality standards attainment but also contain explicit provisions for follow-up monitoring and potential revision. To what extent should TMDLs include provisions for evaluation and iterative improvement?

Discussion

As indicated in Section 5.6 above, the Committee recommends that all TMDLs include follow-up monitoring and potential revision provisions. Tracking TMDL implementation and water quality progress, and modifying TMDLs and implementation plans as necessary to ensure attainment of water quality standards is important to:

— **Address uncertainty** that may exist in many aspects of TMDL development. TMDL allocations and implementation plans may need to be adjusted as new information addressing areas of uncertainty becomes available. It is expected, in fact, that some TMDLs will need to be perfected through an iterative process based on water quality data gathered throughout and following implementation.

— **Oversee TMDL implementation**, to ensure that the implementation plan is carried out.

— **Ensure that the TMDL remains effective**, given economic, demographic, and/or physical changes that may occur in the watershed after the TMDL is developed. The TMDL may need to be adjusted to account for such changes.

In all cases, a TMDL should be developed using the best available information, and be designed to attain water quality standards. The best effort should be made to "get it right" when the TMDL is initially developed, hence avoiding the need for future revision. In some cases (i.e., where data or information on the causes of impairment is slight or of poor quality) it may be apparent at the outset that additional data are needed before fully developing and implementing all the specific control actions that will be needed to achieve the TMDL. In these instances, implementation of control actions/management measures that are reasonably certain to result in progress toward attainment should begin immediately. At the same time, additional data gathering (according to a schedule specified in the TMDL's implementation plan) would take place to determine the remaining control actions/management measures required to achieve water quality standards. The TMDL implementation plan should specify a schedule for development and full implementation of additional control actions/management measures, and should call for planned future revisions to the TMDL to include a schedule for implementation of additional actions. Similarly, controls/management measures may be adjusted to be less stringent if appropriate, although this would need to be done consistent with anti-backsliding provisions for point sources. The revised implementation plan would then be submitted to EPA.

Requiring provisions for follow-up monitoring, evaluation, and potential revision could add to the effort needed to prepare TMDLs, but these steps are critical to ensuring that water quality standards are ultimately attained. As indicated by the hierarchy approach, TMDLs differ in the type and extent of follow-up monitoring and evaluation they require. However, each TMDL must include a step for establishing that water quality standards have been attained.

⊡ Recommendations

1. The Committee recommends that, as set forth in Sections 5.4 and 5.6, each TMDL contain provisions for **follow-up monitoring**, evaluation, and potential revision, to allow for an iterative (or adaptive or phased) approach in cases of uncertainty or lack of success in achieving standards. In all cases, TMDLs (with their associated implementation plans) must be designed to meet water quality standards, but must be modified if necessary or appropriate when new science and information becomes available.

2. The Committee recommends that the type and **extent** of monitoring, evaluation, and revision required be appropriate for the particular TMDL and watershed. For example, as indicated by the hierarchy approach (and its principle of "inverse proportionality"), there should be more detailed and frequent follow-up monitoring for TMDLs developed with relatively less quantitative rigor.

3. The Committee recommends that in addition to issuing regulations requiring an implementation plan (which will include provisions for follow-up monitoring), EPA issue **guidance** on acceptable follow-up monitoring and evaluation provisions, reflecting that each TMDL's implementation plan should describe the consequences of follow-up monitoring, as well as the consequences of failing to undertake the follow-up activities.

Chapter 6: Impairments Due to Extremely Difficult Problems, Atmospheric Deposition, and Flow Modification

PROBLEM STATEMENT

Waters not meeting water quality standards as a result of special challenges related to extremely difficult to solve historic problems, atmospheric deposition, and modifications to flow presented special issues for the Committee. How should the TMDL process address waters impaired by such factors?

6.1 EXTREMELY DIFFICULT PROBLEMS

Discussion

Some water quality standard nonattainment is due in part, or entirely, to extremely difficult to solve historic problems. The Committee believes that waters facing special challenges fall into two categories, discussed further below. Special policy considerations may be appropriate in addressing the water quality impairments caused by these challenges. (These policy considerations apply to both categories with the exception of the treatment of allocations.) The Committee notes that local government is generally responsible for land use planning and solutions to these problems must respect this authority, so long as land use planning is consistent with the TMDL.

The **first narrow category** of difficult historic problems is based on the presence of (a) a physical structure or physical modification that would be impossible or virtually impossible to remove; or (b) those instances where solving the problem will cause more environmental harm than good. The Committee agrees that the following circumstances are included in this first category: large existing dams (not including their operation, maintenance, or potential modifications); interstate freeways; contaminated sediments where a risk assessment performed pursuant to CERCLA, RCRA, or a similar clean-up authority demonstrates that performing remediation would cause more environmental harm than good or where natural recovery is found to be the preferred approach; urban impervious areas such as permanent loss of habitat for aquatic life that could affect water quality (but not for things covered by stormwater management); waste sites where complete removal is deemed impracticable; sources of banned and persistent contaminants where the **removal** of the overlying infrastructure or agricultural topsoil would cause widespread hardship, for example, the presence of chlordane used for termite control under structures; and channelization where development is right up to the bank.

The Committee also recognizes a **second category** of historic problems that require special consideration. These include circumstances where remediation/restoration is technically and/or practically very difficult and extremely costly, where the operation of large physical installations can be managed (but possibly involve costly

modifications), where restoration is a function of processes that are inherently slow (e.g., growing trees), or where no federal, State, or local agency has legal authority to force active restoration. These circumstances are likely to take a long time to affect. The following examples illustrate these circumstances: small dams, culverts, abandoned roads, abandoned railways, some abandoned mines, contaminated sediments (other than those in the first Category described in the preceding paragraph), urban stormwater runoff from impervious surfaces, combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), land clearing activities (where reforestation is necessary to stabilize a site), dikes, field tiles, active CERCLA clean-up sites, nitrate-laden groundwater, extreme stream modifications (e.g., channelization, loss of meander), and operation and management of dams and channels.

⊡ Recommendations

1. The Committee recommends that EPA require States to **include waters** impaired wholly or partially by both categories of special challenge sources on their §303(d)(1) lists.

2. The Committee recommends that the **first category** of special challenge sources be given a **background allocation**. Special challenge sources in the **second category** should be given **allocations with timeframes** appropriate for meeting the allocation.

3. The Committee recommends that States/Tribes/EPA proceed on the **assumption that a feasible TMDL can be developed** for impairments involving special challenge sources. The TMDL should include a (waste)load allocation(s) for the special challenge source, whereupon the implementation plan must lay out specific steps to address this source, based on the nature of the problem.

4. The Committee recommends that, where necessary, a TMDL implementation plan involving special challenge sources **allow a relatively longer timeframe** for water quality standards attainment. Different timeframes for implementation of (waste)load allocations may be needed for special challenge vs. existing sources. For example, existing sources may be required to achieve necessary load reductions quickly (i.e., within a compliance schedule in a 5-year NPDES permit), even if achieving prescribed load reductions for these historic sources is anticipated to take longer. In such a situation, the State may consider relying more on a phased (or iterative) TMDL approach, in which expected loading reductions from special challenge sources over the long-term are factored in when establishing short-term allocations for permit limits for point sources.

5. The Committee recommends that **reasonable reductions be required of existing sources** in light of the relative contribution of special challenge sources. During the time a TMDL is being developed for a water impaired by these sources, States may need to make permitting decisions for existing point sources of the pollutant whose contributions of the problem pollutant may be minor in relation to the special challenge source. In deciding on control actions for existing point sources during that time, States should apply a principle of requiring reasonable reductions, but

should not impose extensive burdens on these sources where the reductions accomplished will not significantly contribute to attainment of the water quality standard.

6. The Committee recommends that, in general, EPA require that TMDLs addressing special challenge sources contain a high degree of **specificity in their implementation plans and detailed provisions for follow-up monitoring**, since source identification and allocation for TMDLs involving these problems may require creative solutions and a relatively longer time period for implementation. While some TMDLs for special challenge problems may require future revision based on such monitoring, like other TMDLs they must always contain all TMDL elements and be designed to lead to full attainment of water quality standards.

7. The Committee recommends that as a **last resort**, if no strategy can be found to address the special challenge source, States may conduct a **Use Attainability Analysis** (UAA) in which they would be required to justify a change in designated uses.

6.2 ATMOSPHERIC DEPOSITION

Discussion

The Committee did not reach agreement on all aspects of how the TMDL program should address waters impaired by atmospheric deposition. However, the Committee did recognize that atmospheric deposition of toxic pollutants (such as mercury and lead) or of nutrients (such as nitrogen) may contribute to water quality impairments in many waterbodies. Atmospheric deposition is somewhat different from a historic special challenge problem because the sources of atmospheric deposition are likely to be ongoing. However, like special challenge problems, impairments wholly or partially caused by atmospheric deposition pose several important challenges to environmental agencies. Some of the challenges discussed by the Committee include:

— **Source uncertainty**: tracing observed pollutants back to atmospheric transport mechanisms, distinguishing between atmospheric and non-atmospheric pollutant contributions, and/or attributing atmospheric pollutant loadings to specific sources;

— **Control authority**: identifying local, State, Tribal, or federal regulatory authorities that can be used to modify source air emissions to meet needed waterbody loading reduction goals or mobilizing authorities under Clean Water Act, Clean Air Act, or other statutes to address air sources in one jurisdiction that are adversely impacting waters in another; and

— **Control strategies**: providing adequate assurances of implementation or developing reasonable, expeditious, and approvable TMDL action plans or strategies for air sources, especially distant sources outside the jurisdiction of the environmental agency preparing the TMDL.

Given these challenges, the Committee agreed that the problem of atmospheric deposition may be important to many water quality problems, not always well understood scientifically, and particularly difficult for States to address. The Committee recommends that EPA conduct and encourage more research into the causes and solutions of waterbody impairment due to atmospheric deposition (See Section 10.2). However, the Committee did not agree on recommendations for listing waters impaired by atmospheric sources, nor on strategies for developing TMDLs if such waterbodies are listed. Various Committee perspectives on §303(d)(1) listing and TMDL development for waters impaired by atmospheric sources are summarized below.

Section 303(d)(1) Listing

Some members felt that, for legal and policy reasons, all waters impaired by atmospheric deposition must be listed. They view the §303(d)(1) list as the list of waters not meeting standards irrespective of the source(s) of the nonattainment problem, and therefore believe the law mandates that these waters be listed. They also note that the lack of knowledge about the source(s) of impairment at the time States make listing decisions will make it impossible to exclude waters from listing based on source considerations. As with historic special challenge problems, they believe that difficulty in addressing the impairment should not influence listing decisions since these concerns are meant to be addressed during TMDL and implementation plan development. The fact that atmospheric deposition may cross State boundaries should not influence listing decisions, in their view, because EPA can assist in developing TMDLs in these instances, and may be assigned responsibility under the State's TMDL to address air sources. They believe that listing waters impaired by atmospheric deposition will ultimately lead to more rapid progress toward water quality standards attainment, by promoting identification of sources and solutions through the TMDL development process. The proponents of this approach also feel that §303(d)(1) listing will help to highlight problems caused by atmospheric deposition, and that this, in itself, will be helpful in stimulating appropriate action.

Other Committee members believe that waterbodies impaired by atmospheric deposition generally should not be listed pursuant to §303(d)(1). They believe that Congress did not require or intend for air emissions to be addressed under the Clean Water Act, and that EPA, States, and Tribes can highlight water quality problems caused by atmospheric deposition and make progress toward water quality standards attainment outside of the TMDL process. These members held several different views on the circumstances under which waterbodies impaired by atmospheric deposition should or should not be listed. Each of the following options were favored by one or more of these members:

1. No waterbodies impaired by atmospheric deposition should be listed because the level of scientific understanding needed to establish cause and

effect relationships (i.e., to identify sources and establish allocations) is not yet available.

2. In cases where the extent of atmospheric deposition is unknown, the waterbody should be listed under §303(d)(1). If it is known that atmospheric deposition is a significant contributor to the impairment the waterbody should not be included on the list or should be removed from the list if already listed. In this context, "significant" cannot be defined generally but depends upon the degree of atmospheric contribution, and the feasibility of addressing the impairment from non-atmospheric sources. For example, if the atmospheric contribution is so large that reasonable reductions from non-atmospheric sources will not significantly contribute toward attainment, the waterbody should not be listed.

3. Waters impaired by atmospheric deposition should not be listed when the sources of atmospheric deposition cross State, Tribal, or national boundaries, because the State would have no ability to control such sources in order to implement a TMDL. If the atmospheric sources of the impairment are entirely within State boundaries, the State would be able to develop a TMDL, and the waterbody should be listed.

TMDL Development

The Committee did not agree on all aspects of TMDL development for waters impaired by atmospheric deposition, assuming that such waterbodies are listed under §303(d)(1). Members identified the following possible approaches:

1. Where atmospheric deposition causes or contributes to water quality impairments, the TMDL development process recommendations for historic special challenge sources would also generally apply (i.e., allowing for a relatively longer timeframe for water quality standards attainment, ensuring that non-atmospheric sources do not have to face extensive regulatory or economic burdens if they do not significantly contribute to the impairment, and encouraging a creative, problem-solving approach to TMDL development using whatever authorities are available).

2. EPA should assume a greater role in developing (or assisting States in developing) TMDLs in cases where out-of-State atmospheric sources dominate. EPA may need to address these atmospheric sources through authorities it has under the Clean Air Act, and EPA is encouraged to develop and apply these Clean Air Act authorities. TMDLs should "trigger" EPA's use of Clean Air Act authorities to address impaired waters.

3. For cases where several impairments are entirely due to the same set of atmospheric sources (e.g., many small lakes with mercury contamination), a

State (or EPA) could develop one TMDL (with one implementation plan) to address several waterbodies and thus ease the resource burden on the agency. In such a case, the "watershed" in question would actually be the airshed that includes all sources that contribute to the impairment. States would need EPA assistance to address contributing atmospheric sources located outside State boundaries.

6.3 MODIFICATIONS TO FLOW

Discussion

Some impairments result from modifications to flow, rather than (or in addition to) loading of specific pollutants. The Committee's discussion of flow modification focused primarily on waters adversely affected by hydrological modifications resulting in insufficient or low flow, such as instream diversions (e.g., for irrigation), or water storage (e.g., catchments). However, the Committee noted that there are other types of flow modifications that can cause water quality impairments, which TMDLs will need to address in some cases. These include human modifications resulting in high flows and freshwater inflows to estuarine areas (that can cause channel scouring, changes in flow velocity, and other physical and chemical problems leading to adverse effects on aquatic life and water quality standards). While we do not offer specific recommendations based on type of flow modification, our more general recommendations affirm that water quality standards nonattainment problems resulting from flow modification are generally within the scope of the Clean Water Act, important to water quality standards attainment, and therefore relevant to the TMDL program.

Water rights are generally governed by State law and it is beyond the Committee's charge to review these laws or to suggest changes in water rights laws or procedures. The Committee believes its recommendations are consistent with Clean Water Act §101(g), which specifically preserves State jurisdiction over quantity allocations.

The Committee believes that where impairments are due to flow alterations, either alone or in combination with other sources of impairment, they must be addressed by the TMDL program to the extent possible. For example, it may be possible in many instances to work within State water laws to address flow problems and attain water quality standards. Federal land management agencies also have the ability to help solve flow problems and should also work with States to assure compliance with CWA §401 certifications. Although not a preferred approach, States could choose to undertake a Use Attainability Analysis (UAA) and this may in some cases eliminate the need to develop a TMDL. As a last resort, under the current regulations, States may, under certain circumstances, employ a non-UAA approach to changing a non-existing designated use (see 40 CFR §131.10 (d)(2) and (4)).

The Committee's recommendations on problems caused by flow modifications are of a general nature because, similar to special challenge problems, addressing such

impairments may require creative problem-solving approaches, and in some cases, a relatively longer time period to achieve water quality standards. Moreover, the Committee recognizes that because State water laws differ widely, and land use planning is an activity within the purview of local governments, it would be difficult to develop specific approaches to flow concerns that could be applied to the TMDL program nationally.

▶ Recommendations

1. The Committee recommends that EPA require States to **include waters impaired wholly or partially by modifications to instream flows** on their §303(d)(1) lists.

2. In situations where modifications to instream flow cause or contribute to water quality standards violations, the Committee recognizes that because of legal, institutional, and political difficulties, in some cases, **more time for creative solutions or funding of those solutions may be needed for TMDL** development and implementation. The Committee recommends that States and EPA consider these circumstances during the TMDL process.

3. The Committee recommends that States identify **strategies for** inclusion in TMDL **implementation plans** to deal with impairments caused wholly or partly by modifications to flow.

4. The Committee recommends that **federal agencies** recognize their responsibility to work within existing legal structures to address flow modification issues which fall under their jurisdiction as part of TMDLs. EPA should assist and encourage other federal agencies to meet these responsibilities.

5. The Committee recommends that EPA provide **technical assistance**, information and data searches, and model water use efficiency/conservation information to States, and encourage the application of **innovative approaches** to addressing flow-related problems, such as water "trading" schemes that allow the improvement of flow.

Chapter 7: Public Participation and Stakeholder Involvement

7.1 PUBLIC PARTICIPATION IN §303(D)(1) LISTING AND TMDL DEVELOPMENT ACTIVITIES

Problem Statement

Communicating with the public and promoting public input into §303(d)(1) listing and TMDL development is key to a successful, robust TMDL program. For progress to be made in cleaning up our nation's waters, the public should be aware of water quality impairments and support actions to eliminate them. At the same time, conveying the complex, often technical information associated with TMDLs is difficult, time-consuming, and resource-intensive for State agencies. What, if any, changes are needed to provide for more meaningful public participation in §303(d)(1) listing and TMDL development activities?

Discussion

The Committee strongly believes that meaningful and well-timed public participation is a cornerstone of a successful TMDL process. Public participation requirements for the TMDL program are generally described in Clean Water Act regulations at 40 CFR Part 25 and are expanded on in §303(d) program-specific regulations and guidance. The regulations state, in part, that environmental agencies should actively solicit data and information relevant to §303(d)(1) list development from local, State, and federal agencies, members of the public, and academic institutions. Public notice is required prior to submittal of a list or TMDL to EPA for approval, and §303(d) program guidance also requires that States provide for "adequate public participation" in list development, priority ranking, and TMDL development activities. EPA must complete the public participation process for any lists and TMDLs it develops.

Reasonable national consistency in list content and presentation would promote public interest in and understanding of the §303(d)(1) listing process, and help stimulate informed participation in and support for the program. While the Committee recognizes that several States have already invested substantial resources in developing and updating their §303(d)(1) lists, some format changes may be relatively easy to incorporate in future listing cycles.

Full adherence to legal requirements will help promote public participation. However, we are concerned that merely following the minimum legal requirements for providing public notice of TMDL listing and development decisions will fail to inform concerned citizens of opportunities to participate and will cause agencies to lose valuable information, input, and cooperation from the public. While increased State, Tribal, local government, and/or EPA efforts to involve the public may require more time and agency resources, we are confident that meaningfully engaging the public at early stages will, in the long run, lead to better-supported, more cost-effective, and expeditiously implemented TMDLs. Assuring implementation that leads to actual water quality standards attainment is, after all, the primary goal of the TMDL program.

▶ Recommendations

1. The Committee recommends that **States actively solicit public comment** on all proposed §303(d)(1) lists and TMDLs. Public comment on all proposed §303(d)(1) lists and TMDLs should be solicited before lists and TMDLs are submitted to EPA for approval so that members of the public have adequate opportunities to influence agency decisions. (States must provide the public with clear listing criteria and specific bases for listings to assist them in commenting on the list). Very extensive public outreach and involvement is recommended in watersheds where public interest is high, solutions are complex and costly, and where there are large nonpoint source communities. States should maintain a notification list of all interested parties in a given watershed, and use it to notify interested parties in advance of public participation opportunities. States should also post (in writing and, if possible, electronically) a schedule of public participation opportunities relating to listing and TMDL development activities.

2. The Committee recommends that EPA encourage States to put in place a **two-step listing process** to ensure that early and informed public comment occurs on §303(d)(1) lists. In the first step, the State would issue a draft list with supporting information (i.e., a listing decision "matrix") and request nominations/comments for additions or other changes. In the second step, the State would issue a revised "matrix," solicit comments on the list, and accept data/information regarding contested listings.

3. The Committee recommends that States consider listing **waters nominated by the public and other agencies** under §303(d)(1), and must list them if supporting data indicate an impairment and meet specified listing criteria and are reliable, e.g., meet State data collection protocols and/or QA/QC program requirements. Waters nominated by the public on the basis of questionable data should be targeted for additional data collection, where warranted. (See Section 3.1 for recommendations on data requirements for listing.)

4. The Committee recommends that EPA encourage States to hold periodic **informal public meetings** to explain the TMDL process, and to solicit input from the public on the development and implementation of specific TMDLs, in cases where such meetings are likely to be useful in promoting water quality goals.

5. The Committee recommends that EPA encourage States (in guidance) to make the following §303(d)(1) **list information available to the public**, to provide regular updates to keep the public informed, and to link §303(d)(1) lists to mapping programs:
   - waterbody segment name and number;
   - waterbody's geographic location (including a georeference);
   - standards violated (e.g., numeric and narrative criteria and beneficial use support;
   - reference to data and reports used to support the listing decision (and reports not used to support the listing decision);
   - information on the severity of impairment and/or criteria exceedances;
   - rationale for decision to list or not list; and
   - priority ranking and scheduling for TMDL development.

6. The Committee recommends that States and EPA encourage and support high quality **private citizen/entity** water quality **monitoring** and clearly communicate how and when such information can be incorporated into TMDL development activities. If data are reliable, they should be used in TMDL development activities.

7. The Committee recommends that EPA, States, and Tribes consider expanding existing efforts to develop and distribute **educational materials** on water quality, including modules for school curricula, pertaining to water quality issues as a way of stimulating public knowledge of and interest in watershed protection and TMDL program activities.

8. The Committee recommends that EPA encourage relatively **more public outreach** in TMDLs where **"best professional judgment"** will be more heavily relied upon. The use of best professional judgment in TMDL listing and development decisions should be documented and explained, and this information should be shared with other professionals and made available to the public.

7.2. STAKEHOLDER INVOLVEMENT IN TMDL DEVELOPMENT

Problem Statement

Stakeholders often have a strong interest in shaping how and when a TMDL is developed and implemented. For a variety of reasons, stakeholders may wish to play a substantial role in (or even lead) some TMDL development efforts. The States and EPA may find stakeholder interest and involvement to be very valuable, given capacity constraints. However, without proper constraints, stakeholder-led efforts may not always be (or be perceived to be) fully objective, or meet all procedural requirements. Given these concerns, to what extent should EPA/States allow or encourage stakeholders to participate in developing a TMDL?

Discussion

State environmental management agencies and EPA are generally responsible for TMDL development. Stakeholders may be able to make an important contribution to TMDL development and should be encouraged to do so. The Committee believes that stakeholder agreement to and support of the TMDL will often result from, as well as promote, strong technical analysis. EPA and States must ensure that a TMDL is developed using the best possible data and analysis. Therefore, as with any other TMDL, a TMDL being developed with significant stakeholder involvement must be scientifically sound, meet all legal and procedural requirements, and be assured of implementation.

Given the number of TMDLs that need to be developed, several years will elapse in some cases between waterbody listing and TMDL development. This delay may be problematic for sources and other stakeholders. It may be difficult for sources to delay making decisions about long-term capital investments and other improvements until a TMDL is completed and approved. In some instances, stakeholders may be eager to begin restoring their waterbody as soon as possible, rather than waiting until the State's scheduled date for initiating TMDL development.

In other cases, active watershed councils or similar bodies are moving forward with restoration plans that could be modified to meet TMDL goals if they were known. In addition, stakeholders may be willing to invest in water quality monitoring and analysis because they fear the State will not have the resources to gather as much data as is optimal. The Committee also anticipates that in some cases, efforts to develop a stabilization plan, or existing watershed management programs, will help promote stakeholder involvement (see Section 3.5).

States and EPA also have an interest in substantial stakeholder involvement in TMDL development. States and EPA have limited resources, which could go further if stakeholders (including other agencies) were able to carry out and/or finance certain TMDL development activities. Enabling/encouraging stakeholder efforts to fund and assist in development of TMDLs may accelerate the overall pace of TMDL development, enhancing a State's ability to complete its TMDLs on schedule. Finally, and perhaps most importantly, stakeholders will generally be more likely to implement a TMDL in which they have participated.

All TMDLs must be submitted by States to EPA for approval, so stakeholders will need State endorsement of their efforts. Early and ongoing State participation and supervision (rather than merely after-the-fact review) in stakeholder TMDL efforts is critical to the success of any stakeholder driven effort. Such State participation is necessary, even though it could affect other State TMDL activities and TMDL development schedules, because the State has the ultimate legal responsibility to develop TMDLs and its supervision is needed to foster the credibility of any stakeholder effort. Without adequate controls and oversight, TMDL activities carried out by stakeholders might not be fair to all concerned parties, meet all legal or procedural requirements, or be fully objective, and thus could ultimately delay the TMDL's completion and ability to meet water quality goals. Some TMDLs and TMDL activities may be relatively more appropriate for stakeholder participation than others, and some are inappropriate for stakeholders to lead.

⊡ Recommendations

1. The Committee recommends that States and EPA **encourage and support a substantial role for stakeholders** in TMDL development, particularly in funding and participating in appropriate (e.g., consistent with the State's technical protocols and/or QA/QC program) data collection and analysis and in TMDL implementation. The agency legally responsible for TMDL development (the State or EPA) must ensure that TMDL activities carried out by stakeholders meet all requirements applicable to TMDLs developed by the State, including providing adequate opportunities for public comment/participation.

2. The Committee recommends that States (or EPA) enter into a **written agreement** with stakeholders when allowing (and especially when relying upon) stakeholders to carry out any TMDL activities. The agreement should clarify stakeholder roles and State expectations for TMDL development, call for a balance of stakeholders to participate in TMDL activities, and specify when the

overseeing State regulatory agency should step in if, at some agreed-upon point, adequate progress in TMDL development has not been made or the terms of the agreement are not being met. Prior to entering into an agreement with stakeholders to carry out any TMDL activities, States should clearly inform stakeholders of what is required for the TMDL.

3. The Committee recommends that States help **assure objectivity** in TMDL activities conducted by stakeholders, by requiring in the written agreement that stakeholders provide information to assist in documenting assumptions (while respecting confidential business information), and that stakeholders consult early and often with the State and other stakeholders on planned and ongoing activities. The agreement should also specify how the State will ensure there are adequate mechanisms for providing all interested stakeholders with a meaningful opportunity to participate. Use of a neutral facilitator should be considered where appropriate.

4. The Committee recommends that **States and EPA**, as appropriate, make it clear (in the written agreement and elsewhere) that they are **legally responsible** for interpreting water quality standards, setting targets, establishing the waterbody's total load, allocating loadings, and assuring implementation of all appropriate requirements. However, they should consider information voluntarily provided by stakeholders when developing a TMDL (to the extent such input is useful and deemed accurate, including stakeholder analyses or modeling to determine pollution sources and the waterbody's needed load reductions).

5. The Committee recommends that **EPA and States** make it clear that the legally responsible agency **may not delegate** its role of **assuring adequate public participation** processes, meeting all legal procedural requirements, and providing all interested stakeholders an opportunity to become involved. However, stakeholders may play an important role in public participation (e.g., by inviting and encouraging other stakeholders to participate fully in any parts of the TMDL process they undertake).

Chapter 8: EPA's Role in TMDL Review and Program Oversight

8.1 EPA OVERSIGHT/MANAGEMENT OF THE TMDL LISTING AND DEVELOPMENT PROCESS

Problem Statement

Clean Water Act §303(d) requires EPA to review and approve or disapprove State-submitted lists of waters in need of TMDLs and individual TMDLs, to ensure their legal adequacy and, for TMDLs, sufficiency to achieve water quality standards. State lists and TMDLs can vary widely in type and quality. In addition, EPA's approval workload will substantially increase in the near future along with the pace of TMDL development. What improvements can EPA make to more consistently and efficiently meet its review requirements, while ensuring that State §303(d)(1) lists and TMDLs meet program requirements? How detailed should EPA's review be?

Discussion

Section 303(d) provides that EPA must approve or disapprove any State §303(d)(1) list or TMDL within 30 days after it is submitted. If EPA disapproves a submission and the State does not agree to correct the problems, then EPA must, within 30 days after its disapproval, complete the list or establish the TMDL as necessary to implement the water quality standard.

Under current practice, EPA considers a number of factors when reviewing a State §303(d)(1) list, including whether the list includes the required components, the basis of listing decisions, and the process used to develop the list. In its review of a TMDL, EPA determines whether the TMDL is sufficient to meet water quality standards.

In general, EPA should offer early assistance and work cooperatively with States to increase the likelihood that State list and TMDL submittals are approvable. There is an urgent need for efficiency and clarity in approval processes, given that the volume of TMDLs EPA must approve is likely to increase dramatically. The Committee also recognizes there is a need for flexibility in EPA's level of oversight, given the dynamic relationships between States, Tribes, and EPA Regions, as well as the wide variety of types of TMDLs to be completed; however, EPA is legally responsible for ensuring that States' TMDLs are sufficient to meet water quality standards, and are not arbitrary and capricious. While several of the Committee's recommendations may support EPA's current practice, they provide specific suggestions on how to address the Committee's concerns.

⊡ Recommendations

1. The Committee recommends that EPA provide **assistance to States** early on and **throughout the process** of §303(d)(1) list and TMDL development (rather than after-the-fact), to ensure that State submissions will be approvable by EPA; this should help minimize disapprovals and wasted effort.

2. The Committee recommends that **EPA offer early and periodic review** (rather than reacting only after a TMDL or list is submitted). The level of EPA review and assistance may vary for each

TMDL, taking into account the length of the State's §303(d)(1) list, type of TMDL, and other relevant circumstances. EPA's oversight of, and assistance to, State TMDL listing and TMDL development should be **focused on assuring approvability** when the State action is submitted for EPA approval**.**

3. The Committee recommends that EPA's oversight and review of State TMDLs be marked by **specific milestones and progress checkpoints**. Its purpose should be to assure that TMDLs ultimately meet federal requirements and to provide useful and early assistance to the State, as necessary. Failure to meet a single checkpoint should not constitute grounds for immediate disapproval of a TMDL, so long as the deficiency is corrected before final approval.

4. The Committee recommends that the **degree of EPA oversight** of/involvement in TMDL development activities vary according to relevant **factors**, such as:

   — the degree of **controversy and technical complexity**;

   — the extent to which the TMDL is considered **innovative** or ground-breaking;

   — whether the TMDL involves multiple **jurisdictions** (and other federal agencies);

   — the quality of **State performance** or extent of State program experience: States with extensive experience or superior past TMDL program performance should require less rigorous reviews by EPA; and

   — the degree and balance of **stakeholder involvement**.

5. The Committee recommends that EPA define, in regulations and guidance, **specific procedures and criteria** for preparation of TMDLs, based on the approval criteria described in Section 5.4. If the State adopts these procedures and criteria and agrees to apply them, EPA could approve the State's approach initially to ensure that it meets EPA guidelines. Then, EPA review of individual TMDLs could be less rigorous (although it is still necessary that EPA determine that each TMDL is sufficient to meet water quality standards, and EPA approval is still subject to judicial review). More detailed EPA review should be required in cases where the State deviates from the specified procedures for TMDL development.

6. The Committee recommends that EPA incorporate into guidance a **TMDL checklist** that describes the recommended features of an approvable TMDL submission. The checklist, based upon the approval criteria described in Section 5.4, would help to: (1) streamline the review process; and (2) provide greater certainty to States, EPA, and the public regarding the features of an approvable TMDL.

7. The Committee recommends that **components of an existing program**, including water quality analyses, pollution controls, and/or management measures, or modifications of such components, **may be approved as or incorporated into a TMDL** if the State shows, and EPA finds, that the State submittal meets all substantive approval requirements of a TMDL (including

appropriate alternative approval options identified in "The Outline of the Hierarchy Approach to TMDL Approval" (Appendix G)) and was adopted after adequate opportunities for public participation. (See also Section 5.6, Recommendation 2.a.)

8.2 ASSESSING STATE PROGRAM EFFECTIVENESS: EPA'S ROLE IN OVERALL PROGRAM DEVELOPMENT

Problem Statement

In addition to its review and approval role for §303(d)(1) lists and TMDLs, EPA has a responsibility to oversee the overall TMDL program, just as it does for other EPA-authorized and funded environmental programs. In this role, EPA provides general technical assistance and guidance to States, and works to ensure consistency across States. How might EPA best oversee and assist State TMDL programs?

Discussion

EPA has an important role both in assessing State TMDL program performance and assisting States to carry out TMDL program activities. Our recommendations in this section focus on overall program assessment, along with integration of TMDL activities into other State and EPA planning activities and specific incentives that might help ensure strong overall State performance in the TMDL program. (Note: Sections 10.3 and 10.4 below contain additional recommendations on guidance and other tools needed to assist State decision makers, as well as capacity-building for State programs.)

▶ Recommendations

1. The Committee recommends that the **extent of EPA oversight** of, and assistance to, overall State TMDL programs be based on the degree of complexity and volume of State TMDL activity and past State TMDL program performance. Some degree of EPA oversight and feedback on State TMDL performance is always necessary. This programmatic oversight is in addition to EPA's mandatory duty to review and approve or disapprove a State's §303(d)(1) list and individual TMDLs.

2. The Committee recommends that when assessing the overall effectiveness of a State TMDL program, EPA consider the (1) **sufficiency of decisions**: whether specific State listing and TMDL development decisions are based on best available science and will ensure attainment of water quality standards; (2) **timeliness**: whether the State TMDL program meets all statutory, regulatory, or court-imposed deadlines; and (3) **sufficiency of process**: whether the State's TMDL program meets statutory and regulatory procedural requirements (including public participation provisions), and how well the State meets (or justifies deviation from) program guidance.

3. The Committee recommends that State **TMDL development schedules** be **incorporated in** the **State's Performance Partnership Agreement** with EPA. (See Section 4.1, Recommendation 4). Those agreements should also reflect other appropriate TMDL activities since addressing water quality impairments should be the water program's highest priority.

4. The Committee recommends that EPA use a combination of **incentives and disincentives to ensure strong State performance** in the TMDL program, such as: grants (to reward good performance) and published EPA reports about program progress and results (to enhance State program accountability to the public).

Chapter 9: The Role of Tribes

Problem Statement

Tribes have a strong interest in protecting the quality of waters on tribal lands, other waters for which they retain rights to fish and otherwise use, and waters that affect uses to which they have rights. Jurisdictional issues and lack of understanding of the Tribes' government-to-government relationship with the federal government can complicate tribal roles in watershed management. In 1986, the Clean Water Act was amended to allow Tribes to seek authorization for their Clean Water Act programs. Currently, a number of Tribes are seeking Water Quality Standards and other Clean Water Act program approval. To date, however, no Tribe has sought TMDL program authorization. In fact, many Tribes are only now learning about the TMDL process. How can Tribes participate most effectively in TMDL program activities, both on tribal lands and outside tribal boundaries?

Discussion

Many Tribes are currently building their Clean Water Act capacity. Others, however, face pressing needs elsewhere that make it difficult to give water quality protection high priority. Tribes will need sufficient time, resources, and program support to build water quality and TMDL program capacity. The Committee applauds EPA and States for their increasing efforts to work with Tribes on water quality issues. At the same time, we see the need for additional attention and want EPA to carefully consider how to use its available resources to best support Tribes in these endeavors.

Whether or not Tribes choose to develop TMDL program capacity, they remain keenly interested in and want to participate in TMDL development activities that affect tribal rights and/or lands. As well, some Tribes gather extensive data on water quality and the health of fisheries that can be used in TMDL programs. To respect Tribal sovereignty and work effectively with Tribes on water quality issues, however, EPA and State agency staff often need to learn more about the government-to-government relationship. Effective TMDL program Tribal outreach and education must therefore serve two purposes: support Tribes as they work to build water quality protection capacity; and prepare EPA and/or State agency personnel to seek input from and work with Tribes to address water quality problems, both on and off tribal lands.

▶ Recommendations

1. The Committee recommends that Tribes not be treated simply as members of the public who are interested in watershed management or protecting specific waters. Rather, they are sovereign governments with established rights related to the management and protection of natural resources and have a trust relationship with the federal government. EPA should consider using the model **Memorandum of Understanding project in Washington State** involving Tribes, EPA Region 10, and Washington Department of Ecology as **a national model** for building Tribal-EPA-State partnerships.

2. The Committee recommends that EPA increase efforts to help **educate Tribes about the substance and importance of the TMDL program**.

   — Develop and distribute training video series, fact sheets, newsletters, and other training/educational materials that help **build Tribes' awareness and understanding** of the TMDL program;

   — Reserve spots for Tribal representatives at EPA-sponsored training sessions and, where possible and appropriate, hold **one-on-one trainings** with Tribal Environmental/Water Quality Program staff (e.g., through staff exchange programs); and

   — work with the National Indian Workgroup, the Tribal Operations Committee, and other appropriate advisory groups, to **link TMDL program outreach efforts to other efforts** already involving Tribes and in which Tribes have developed trust or allegiance.

3. The Committee recommends that EPA **increase the financial resources** it makes available to Tribes to **build Tribal TMDL program capacity**.

4. The Committee recommends that EPA headquarters work with State and EPA regional staff to ensure that the **government-to-government relationship** is respected during §303(d)(1) list and TMDL development and review.

   — EPA should train EPA Regional TMDL Coordinators and State Agency staff about the government-to-government relationship.

   — EPA should require that State TMDL processes provide adequate opportunities for Tribal input and data to be used in §303(d)(1) listing and development decisions for waters not on tribal lands that directly affect tribal interests (e.g., upstream activities that affect tribal waters).

   — EPA should not approve any TMDL for which the State failed to attempt to consult with appropriate Tribes during allocation discussions.

Chapter 10: Coordination, Technical Support, and Capacity-Building

10.1 COORDINATING FEDERAL ACTIVITIES FOR WATERS NOT MEETING WATER QUALITY STANDARDS

Problem Statement

More than 30% of the land area in the United States is federally managed by agencies such as BLM, USFS, the U.S. Park Service, Department of Defense, Department of the Interior, and others. Most of these lands are in the western United States. Who should develop TMDLs for waters that are primarily or entirely on federal lands? What is the role of federal land managers in TMDL development and implementation?

Discussion

Strong federal leadership in restoring impaired waters will help **bring about strong public support** for the program. EPA is the leader among federal agencies in protecting water quality but other agencies also have an important and unique role to play in meeting the goals of the Clean Water Act and restoring impaired waters, including implementation of §303(d)(1). Section 313 of the Clean Water Act specifically mandates that federal agencies "shall be subject to and comply with all Federal, State, interstate, and local [water pollution control and abatement] requirements." The importance of this mandate is especially clear in western States that have significant water quality pressures from federally permitted logging, grazing, and mining activities.

▶ Recommendations

1. The Committee recommends that EPA require States to **include waters** that do not meet water quality standards and that **flow through or are located on federal lands in** their **§303(d)(1) list** submittals. EPA, in its review of a State's §303(d)(1) list and priority ranking, should verify that such waters are listed and ranked/scheduled in an appropriate manner. (See also Section 4.2 of this report for related discussion of priority ranking and scheduling.)

2. The Committee recommends that **federal land management agencies** be required to **monitor** waters on their lands **for compliance** with water quality standards and/or TMDL requirements and to regularly provide such information to EPA and/or the appropriate State environmental agency. Furthermore, EPA should work closely with other federal agencies, including all agencies responsible for federal facilities discharging to surface waters or for federal lands management, to **ensure that the data they collect conforms to water quality standards**, State protocols, and TMDL development needs. States must endeavor to **obtain and consider all such data** in the possession of federal agencies. (See also Sections 5.2 and 10.3 for additional Committee discussion related to monitoring.)

3. The Committee recommends that in the time between §303(d)(1) listing and TMDL development, federal agencies **use available authorities** (e.g., USDA's Conservation and/or Wetlands Reserve Programs on eligible private lands, highway construction authorities under ISTEA, limitations on HUD funding for urban development, logging and grazing permit authorities, or licensing authorities) to **minimize or prohibit,** as appropriate, **new or increased pollution loadings** that will

cause or contribute to a water quality standards violation from point and nonpoint sources pending the TMDL's completion. In addition, federal facilities subject to NPDES permitting must meet the same requirements as other point source dischargers during this interim period. (See Section 3.5 for related discussion.)

4. The Committee recommends that EPA and States **ensure that TMDL requirements are incorporated in NPDES permits for federal facilities,** that those requirements are fully **implemented** (and enforced as necessary), and that other Clean Water Act programs affecting federal facilities or activities (e.g., nonpoint source management programs that affect federally funded highway construction) also are carried out to assure that TMDLs are effectively implemented.

5. The Committee recommends that **States, EPA, and federal agencies** all **participate in TMDL development** on federal lands. Consistent with EPA's current policy, States should retain responsibility for developing TMDLs for impaired waters on federal lands. **Federal land managers** should **fund data collection** and **analysis** needed to **identify** waters on their lands that do not meet water quality standards and to **develop** TMDLs for them. Federal land managers must provide such data and analyses to the appropriate State. EPA should play a more prominent role in TMDL development activities on federal lands when it (1) is invited to [by the State] or (2) fails to see adequate progress toward TMDL development.

6. The Committee recommends that **federal land managers** be required to **assure** that **allocations over which they have oversight and authority are met**. Each affected federal agency must develop plans, including specific milestones, that describe all steps the agency will take, including reopening appropriate permits and licenses, as necessary to assure (waste)load allocations and schedules will be met expeditiously. This information should be incorporated into the TMDL implementation plan.

7. The Committee recommends that **permitted users of federal lands** and other stakeholders be **included early on in discussions** pertaining to allocation decisions.

8. The Committee recommends that EPA use its influence, to the maximum extent of its authority, to ensure that States, federal land management agencies, and permitted users of those lands, **comply with the law and use all existing State and federal authorities to** fully implement and **meet the provisions of approved TMDLs**. The State retains responsibility for obtaining appropriate reductions through its independent authorities and the activities it permits (e.g., through CWA §401 certifications and/or NPDES requirements).

   — No federal permit or license (e.g., CWA §404 permits) should be issued unless the activity complies with applicable TMDLs.

   — Non-EPA federal permits and licenses must be reopened expeditiously and revised pursuant to all applicable TMDLs. However, it may be appropriate for long-term permits (i.e., those having cycles longer than five years) that will expire within one to two years to be revised at the time of reissuance.

10.2 COORDINATION CHALLENGES AND OPPORTUNITIES

The Committee sees a strong need to link EPA's TMDL program much more closely to other environmental programs, both within and outside EPA. Water quality problems can result from many activities beyond the scope of EPA's water quality program authorities. Air deposition, highway construction, grazing, and timber harvesting on federal lands are just a few examples of such activities. The Committee recognizes that TMDL program goals must be balanced with other agencies' and/or offices' competing goals and priorities. However, correcting impairments in the nation's waters should be a high priority for all.

10.2.1 Coordination with Other Federal Agencies

Problem Statement All federal agencies have a duty to meet Clean Water Act requirements, including those under §303(d); some also have water quality protection duties under their own authorizing statutes. How can EPA best coordinate its TMDL program efforts with related efforts by other federal agencies? What role should EPA play? How might other agencies support and advance restoration of impaired waters?

Discussion Federal facilities and federal lands must be managed in a way that ensures compliance with the Clean Water Act, including the TMDL requirements. They should be managed to serve as models to businesses and landowners in assuring water quality protection and bringing impaired waters into attainment with applicable standards. **Federal agencies need to work cooperatively and proactively with State environmental agencies and EPA** to protect and restore the quality of waters that flow through federal lands or to which federal facilities are discharging pollution.

⊡ Recommendations

1. The Committee recommends that all federal agencies use all available authorities and **take all necessary actions** to carry out the requirement to **ensure that activities** they conduct, authorize, permit, or fund **meet Clean Water Act requirements** (including §303(d)) and State water quality goals.

2. The Committee recommends that, where appropriate, **federal agencies coordinate** their **monitoring programs** and develop consistent protocols to avoid duplication of effort and improve their ability to obtain and transfer common information.

   — EPA/States enter into Memoranda of Understanding or Agreement, as appropriate, with federal agencies to specify activities (e.g., data collection) on which to coordinate or participate in support of TMDL program efforts to identify and restore impaired waters.

3. The Committee recommends that in completing and implementing TMDLs, EPA and other federal agencies ensure that the requirements of the **Endangered Species Act**, the Magnuson-Stevens

Fisheries Management and Conservation Act, and **other applicable statutes are met**. This will require, among other things, that EPA and States:

— work with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service (together: the Services), and the appropriate State agencies to assess the geographic range of all federally and State-recognized threatened, endangered, and sensitive species that may potentially be affected by water pollution to assist in properly identifying waters for the §303(d)(1) list; and

— work with the Services and appropriate State agencies to identify all federally and State-recognized threatened, endangered, and sensitive species that may be affected by pollution in the geographic area of §303(d)(1)-listed waters; and

— coordinate with, and where appropriate formally consult with, the Services and/or the appropriate State agencies to ensure that individual TMDLs are adequately protective of federally and State-recognized threatened, endangered, or sensitive species.

4. The Committee recommends that to promote federal consistency, EPA **circulate all approved §303(d)(1) lists** and relevant **TMDLs to federal agencies**. EPA should also invite other federal agencies to consult with EPA/States on pertinent TMDLs.

5. The Committee recommends that EPA encourage other federal agencies to **give priority to funding projects**, where appropriate (e.g., through USDA's Conservation Programs or NOAA's Coastal Nonpoint Pollution Control Programs), **to identify and restore impaired waters** listed under §303(d)(1).

6. The Committee recommends that EPA explore opportunities to **include or build upon Habitat Conservation Plans and Forest Management Plans** (and other federal planning processes addressing water quality) in §303(d)(1) listing and TMDL development and implementation planning activities. Such processes should be integrated as fully as possible with TMDL efforts to focus management planning and implementation activities on restoring water quality, even though these planning processes will not automatically substitute for and/or be approvable as a TMDL. (See also Sections 5.6 (recommendation 2.a.) and 8.1 (recommendation 7) for other recommendations related to this topic.)

10.2.2 Jurisdictional Coordination for Shared Pollution Problems

Problem Statement TMDLs often require the cooperation of two or more overseeing agencies (e.g., to address waterbodies that straddle two or more jurisdictions or that are affected by sources in other jurisdictions). What is the best way to address water quality problems that involve two or more jurisdictions? At what point should EPA become involved (or exert leadership) in these efforts?

Discussion Not all water quality problems in waterbodies that flow through multiple jurisdictions are shared pollution problems. However, for those that are, the

Committee believes interjurisdictional cooperation and coordination is the best way to assure that proposed TMDLs are sound, equitable, and assured of implementation.

▶ Recommendations:

1. The Committee recommends that state environmental management agencies continue to **coordinate** TMDL development and evaluation activities for shared pollution problems.

   — **EPA** should **play a prominent role**, including development of necessary TMDLs, in **multijurisdictional TMDL** discussions/activities when (1) it is invited to by one or more of the State environmental management agencies or (2) it determines that the State agencies are not making adequate progress.

   — EPA should clarify in guidance how it will determine which multijurisdictional TMDL processes require its focused attention.

2. The Committee recommends that EPA **synchronize TMDL scheduling, development, and/or implementation** activities for waters shared by multiple jurisdictions where this will not result in unreasonable delays and will promote coordinated, effective solutions.

3. The Committee recommends that EPA **disapprove TMDLs** that will **cause or contribute to violations of downstream water quality standards**. EPA should encourage States to work with downstream jurisdictions to make sure water quality standards of the downstream jurisdiction will be met by the TMDL.

10.2.3 Coordination Challenges and Opportunities within EPA

Problem Statement

TMDL program staff and even water quality program staff lack authority to address many causes of impairment. It is critical to the success of the TMDL program that all the relevant environmental authorities be brought to bear to assure attainment. How can/should the TMDL program integrate its efforts with those of other EPA/State/Tribal environmental programs?

Discussion

There appear to be numerous opportunities to better coordinate EPA TMDL program activities with a variety of other environmental quality programs (both within and outside Clean Water Act authorities).

There are at least five challenges to integrating the TMDL program with related Clean Water programs (e.g., the NPDES permitting program and the §319 Nonpoint Source program): (1) Clean Water Act programs are driven by somewhat different missions and purposes (e.g., the §319 program focuses on waterbodies adversely affected or potentially adversely affected by nonpoint sources and the NPDES program focuses on point sources regardless of the quality of the receiving water); (2) programs adhere to different schedules (e.g., to collect data in support of

Congressional reporting); (3) programs base decisions on data meeting various tests of required rigor (e.g., §319 lists rely on anecdotal as well as assessed information); (4) programs do not necessarily share definitions for key terms (e.g., "impaired," "threatened," or "monitored" waters); and (5) historically, States have adopted a wide range of approaches to implementing these Clean Water Act programs.

EPA's Office of Water, through its emphasis on the watershed approach and other management innovations, has been working to address many of these concerns. However, more needs to be done. As well, it will be important for EPA to look at ways and encourage authorized States and Tribes to use the Resource Conservation and Recovery Act, Clean Air Act, CERCLA, and FIFRA authorities (and other statutes it implements) to implement TMDLs and address causes of impairments.

▶ Recommendations

1. The Committee recommends that EPA recommend (and/or use §106 grant authority to require that) States **coordinate data collection** activities for (at least) the Sections 303(d), 305(b), and 319 programs to eliminate redundancies.

   — EPA should help States integrate and consolidate water quality data collection activities to **eliminate redundancies** and assure that collected data are useful for the TMDL program.

2. The Committee recommends that EPA provide **guidance to NPDES** permit writers on how to use information in §303(d)(1) lists and TMDLs during review of individual permits and add location of a source on a §303(d)(1)-listed water as a factor to consider in determining when EPA reviews State-issued NPDES permits.

3. The Committee recommends that EPA increase its efforts to **review and apply, as appropriate, Clean Air Act authorities** to address water quality impairments caused by air deposition of pollutants. (See also Section 6.2 for related Committee discussion).

4. The Committee recommends that EPA Offices of Water and Air accelerate joint efforts to **understand sources, transport and fate of airborne pollution** to waters. In particular, EPA should identify the relative proportions of natural and anthropogenic sources of airborne nitrogen loads in different parts of the nation.

5. The Committee recommends that EPA use its **§319** Nonpoint Source Management program oversight authority to assure that States give **funding priority** to nonpoint sources causing or contributing to impairments of §303(d)(1)-listed waters to meet TMDL implementation plan provisions.

6. The Committee recommends that **EPA remove restrictions on the use of §319 funds** so that States will have the flexibility to decide what percentage of these funds can be used to develop TMDLs for waters which are significantly impaired by nonpoint sources.

7. The Committee recommends that EPA ensure that waters not attaining standards are given **high priority in relevant programs** under the Clean Air Act, RCRA, CERCLA, FIFRA, and other statutes it implements. EPA should ensure that actions taken under these statutes are tied into and conform with the needs and requirements of TMDLs and standards.

8. The Committee recommends that TMDL program staff in the regional EPA offices cooperate with each other to **promote consistent and equitable TMDL policies nationwide**.

10.3 TECHNICAL GUIDANCE AND ASSISTANCE NEEDS

Problem Statement

The TMDL program is broad and complex. TMDLs address many different types of impairments, types of waters, and types of sources. TMDLs must coordinate and integrate a wide variety of federal, State, and local authorities and programs. At the same time, State experience with the TMDL program varies widely. State programs may not currently possess the full range of knowledge necessary to apply the TMDL program to restore and protect impaired waters. What technical assistance and guidance should EPA provide to ensure State TMDL programs are strong and effective?

Discussion

One of EPA's most important responsibilities in administering the TMDL program is to provide technical guidance, technical assistance, and training to States to assist them in developing their program capacity and carrying out their TMDL program responsibilities. High quality technical guidance and assistance is critically important for a strong and effective TMDL program, as it will help ensure a reasonable degree of consistency across States in TMDL program activities, promote efficiency in TMDL listing and development decisions, help assure the defensibility of State actions, better ensure implementation, and generally foster the application of sound science throughout the TMDL process.

EPA guidance and policy statements are used as the basis of approval decisions, and are an important resource for States in making decisions about TMDL listing and development. The Committee's recommendations are directed at future EPA guidance as well as regulatory revisions.

In addition to formal guidance, EPA provides technical assistance (such as training programs, information clearinghouses, and expert assistance) to States, and develops/provides science and tools to assist in TMDL program activities.

The Committee focused on identifying the highest guidance and technical assistance priorities, given that EPA has a limited capacity for such activities. Our recommendations focus on: (1) the aspects of the TMDL program for which technical assistance is particularly needed; and (2) the methods of delivering technical assistance that are most appropriate. It should be noted that the

Committee has included recommendations on guidance and technical assistance throughout this report. The list below focuses on high priority needs to improve the scientific support and technical defensibility of TMDL actions. (See also Chapter 9 for additional discussion and recommendations concerning technical assistance for Tribes).

⊡ Recommendations

1. The Committee recommends that EPA continue to increase its efforts to provide **comprehensive guidance** (and regulations) in a clear and usable format for States, EPA staff, and stakeholders to use in all TMDL program efforts. Greater clarity is needed in almost all aspects of the TMDL program.

2. The Committee recommends that EPA's **highest priorities** for science and tool development include improving monitoring and modeling capabilities, and providing related technical assistance/training; EPA's second highest priorities include assisting States in development of additional numeric criteria and to increase understanding of the effectiveness of best management practices; and EPA's third highest priorities include developing tools to assist in stakeholder communication, developing a better understanding of the costs associated with TMDL development and implementation, and establishing methodologies to assist in evaluating TMDL effectiveness.

3. The Committee recommends that EPA and States/Tribes support and increase current monitoring and data gathering efforts to the fullest extent possible, because data availability is critically important for a strong TMDL program. EPA should make **monitoring for the TMDL program a higher priority** than it is currently relative to the monitoring needs of other programs, and should encourage States/Tribes and other federal agencies to do so as well. EPA should also revise §106 guidance to reflect State monitoring program changes needed to support the TMDL program.

4. The Committee recommends that EPA continue to **support ongoing efforts** (such as the Intergovernmental Task Force on Monitoring) to promote **data coordination** among agencies and institutions, and to standardize monitoring data. (This is critically important because EPA and the TMDL program rely primarily on States/Tribes, local governments, and other federal agencies to gather data). (See related recommendations in Section 10.2, above.)

5. The Committee recommends that EPA develop guidance on TMDL development and data needs for critical conditions associated with **high flow/wet weather**. There is a need for greater clarity on how to develop TMDLs (for example, what assumptions to make on source identification and allocation) under high flow conditions, when nonpoint source loads are more likely to dominate.

6. The Committee recommends that EPA make targeted **technical assistance** a high priority and, in the spirit of partnership, work with States to provide such technical assistance where and when it is most useful. Different approaches to training/technical assistance are appropriate for different aspects of the TMDL program. For example:

— **Templates, flowcharts, and (computerized) checklists** are needed in such aspects as: making listing decisions; ensuring that all available (existing) data are used in TMDL development; ensuring that gathered data conform fully with water quality standards, are reliable, and are in the proper format; ensuring environmental justice issues are considered among beneficial use support considerations; making and documenting assumptions (including those used to develop adequate surrogate measures); selecting and documenting the establishment of TMDL endpoints; and training staff in the tools and procedures that are necessary for TMDL development. Such tools will help foster greater consistency among States, facilitate EPA review, streamline many TMDL processes, and assist in documenting decisions.

— Increased **Regional EPA staff assistance** to States is needed in almost all aspects of the TMDL program.

— A **specialized team** (of EPA staff/consultants) to provide expert assistance would be particularly valuable for helping States/Tribes with model applications.

— **Workshops and training programs** are needed (on an ongoing basis) in several areas, including: applying/interpreting water quality standards in the TMDL program; identifying sources; making and documenting assumptions; choosing models; establishing wasteload and load allocations (including the Margin of Safety); developing implementation plans; and establishing iterative TMDL processes (provisions for follow-up and evaluation).

7. The Committee recommends that EPA **explore new training techniques**, such as checklists and satellite training, to achieve technical assistance objectives cost-effectively and to provide consistent communication to and among EPA Regions, States, and Tribes.

10.4 EPA, STATE AND TRIBAL CAPACITY

Problem Statement

Federal and State TMDL programs face tremendous workload challenges now and in the future. Monitoring waters, identifying impairments, developing (and defending) needed TMDLs, and assuring both implementation and revisions as necessary to assure attainment will take many years, even with adequate staffing and support. EPA and States are poorly equipped to face these challenges. Staffing and support is inadequate given the urgent need to solve water quality impairments and the public interest in doing this expeditiously, fairly and cost effectively. EPA and many States are working hard to strengthen their programs and increase their efforts. What more should EPA do to address capacity problems in the TMDL program?

Discussion

EPA's TMDL program is understaffed at all levels, as are State implementation programs. Although there have been increases recently, at least in the regional offices, there are currently only three full-time headquarters staffers working on the program and far too few EPA regional experts available to work with States to assure that lists and TMDLs are approvable. Of necessity, much of the work being done by

this small staff is reactive (e.g., reviewing State actions, responding to lawsuits, and addressing issues and questions raised by others). Progress has been made in producing strategies and guidance to support the program. However, to meet the guidance and support needs summarized above and to respond to the recommendations in this report for revising and strengthening the program, additional staff will be needed to more fully flesh out the national infrastructure, support State efforts, coordinate with other programs and federal agencies, and manage this large and critical program to restore water quality.

An early investment in improving the program's technical, regulatory and guidance infrastructure will help avoid inefficiencies and inconsistencies in the program that would otherwise be problematic in future years. The program is in early stages of implementation and many more TMDLs remain to be done. An adequate investment in developing model TMDLs for particularly difficult problems and providing technical support to States and stakeholders will save the agency the resources otherwise required to carry out the program where States fail to submit approvable lists and TMDLs. In addition, resources potentially needed to defend and correct deficiencies in TMDLs can be minimized through proper advance work to strengthen guidance and technical support.

EPA also needs to focus more resources on **related programs** to support the restoration of impaired waters. For example, water quality criteria are needed to more fully address use impairments resulting from such causes as excessive nutrient loadings, sediment and habitat loss. As another important example, monitoring programs need to be expanded so that impairments can be identified, progress can be tracked, and attainment can be documented when it is achieved.

EPA should also help **identify lower priority activities** on which federal and State water quality programs could reduce emphasis while focusing more effectively on providing for attainment of water quality standards in waters listed under §303(d)(1).

Other federal agencies need to devote more resources to TMDL-related activities as well. For example, the U.S. Forest Service and the Bureau of Land Management need to build TMDL-related monitoring, analysis and implementation, including restoration, into their budgets routinely where they manage land through which impaired waters flow or are major stakeholders on impaired waters. These agencies are legally required to comply with the Clean Water Act, State water quality standards, and TMDLs. USGS and other agencies with environmental monitoring responsibilities should increase monitoring efforts in support of the TMDL program. EPA cannot and should not be expected to bear the entire cost of these activities. (See also Sections 10.1 and 10.2 for discussion of related issues.)

Some **States** have recognized the value of (as well as the need for) strengthening their TMDL program capacity by dedicating more staff and support to the effort. Others have not, even though they may have recently identified large numbers of

impaired waters needing TMDLs and have little experience preparing TMDLs. The quality and number of TMDLs these States can produce will be severely constrained by the limited capacity of current staff and support. EPA can do more to help these States improve their ability to carry out the TMDL program effectively by promoting national dialogue on the need to meet water quality standards and providing analytical methods and tools to help estimate TMDL program capacity needs.

In the meantime, **EPA** is being or may be required by law to step in and make decisions on identification and TMDL development for impaired waters in these States, diverting valuable EPA resources from making the program infrastructure more robust and providing expert technical assistance in particularly complex or difficult impairment situations. Historically, such EPA action (and/or the threat of EPA taking direct action) has caused States to appropriate additional funds or reprogram existing resources to strengthen a deficient program. Nevertheless, even a temporary diversion of EPA resources could have an important long term negative impact on the national effort at this crucial stage of the program.

▶ Recommendations

1. The Committee recommends that EPA lead a **national dialogue** involving high level policymakers in State and federal government, as well as local governments and other stakeholder groups, to promote political and fiscal commitment to attaining water quality standards and restoring impaired waters.

2. The Committee recommends that EPA seek authorization for or reprogram **increased staff and dollars** into the **TMDL program** at headquarters and in the regions to carry out the recommendations in this report so that impaired waters are restored in the shortest possible time. EPA should also review existing programs for opportunities, and consider new mechanisms to support State TMDL programs (e.g., by making funds available or increasing the funds available for TMDL development through the State Revolving Fund, §319 grants, and other programs or funding authorities with shared water quality goals.

3. The Committee recommends that EPA and States be encouraged to review existing water quality program guidance and requirements (e.g., through the Performance Partnership Agreement process) to **identify lower priority activities** that could be assigned reduced emphasis in order to increase emphasis on TMDL efforts. States should **propose how program priorities should change** and then work with EPA to reach an agreement on how to implement agreed-to changes via EPA Regional Office/State agreements, workplans, and other appropriate agreements.

4. The Committee recommends that, in the short term, **EPA** seek authorization for or reprogram **increased staff and dollars to increase assistance to States** for TMDL development, to perform TMDL review and approval activities in a timely manner, and to **carry out its responsibility to take TMDL program actions** where State actions are inadequate. (As States increase their capacity, these resources could be reprogrammed into other priority activities.)

5. The Committee recommends that **EPA** seek authorization for or reprogram resources into **monitoring, standards and other implementation activities** (such as NPDES and §319 programs) as necessary to ensure that: impaired waters are more accurately identified; TMDL development is more solidly based on quantified data and scientifically sound analysis and standards; and implementation of the program, including full protection of beneficial uses, is assured.

6. The Committee recommends that EPA, in cooperation with State water quality officials, **work with other federal agencies** to assure that they have provided for TMDL-related activities in their **budgets and work plans** and to encourage those agencies to provide assistance to States for TMDL-related efforts. (See also Sections 10.1 and 10.2 for other recommendations on federal coordination.)

7. The Committee recommends that EPA foster and **encourage States to seek additional funds and staff** to carry out their TMDL programs. For example, EPA should develop (and/or assist States in developing) sound **analytical methods and tools** to identify TMDL program needs under various scenarios, including various TMDL completion schedules. In addition, EPA should consider conducting a national **TMDL capacity needs survey**, focusing first on capacity for TMDL monitoring, listing and development and expanding later, if appropriate, to include implementation needs. EPA should also consider offering **incentives to States** to improve their TMDL program capacity (e.g., by allowing certain reports or other work to be postponed when States are increasing resources to restore impaired waters through the TMDL program).

8. The Committee recommends that EPA increase its efforts to **strengthen Tribal capacity** to carry out and participate effectively in the TMDL program in accordance with Chapter 9 of this report. EPA should also provide **financial assistance to Tribes** to support TMDL program development.

9. The Committee recommends that EPA and States **encourage stakeholders to participate** fully in the TMDL program and to fund watershed planning and protection activities wherever possible. (See also Chapter 7 for additional recommendations on stakeholder participation.)

Appendix A: NACEPT Committee Charge

National Advisory Council for Environmental Policy and Technology (NACEPT) TMDL Committee Charge

BACKGROUND

Section 303(d) of the Clean Water Act (CWA) establishes the TMDL, or total maximum daily load, process as a tool to implement State water quality standards. States are required to identify and list water bodies where water quality standards are not met following the application of technology based controls, and to establish TMDLs for these quality limited waters. The U.S. Environmental Protection Agency (EPA) is required to approve or disapprove State lists and TMDLs, and to develop lists and TMDLs where States fail to do so.

EPA is seeking advice and innovative suggestions for new policy and regulatory directions from stakeholders who bring broad perspectives and diverse backgrounds to the deliberations. Recent litigation illustrates the need for EPA and interested stakeholders to review the current TMDL program and recommend changes. EPA believes that a broad scale view of the program will provide consensus recommendations consistent with current CWA requirements. The results of these deliberations will be advice and consensus policy recommendations to the Administrator, the Assistant Administrator for Water, and the NACEPT. The advice and policy recommendations will address:

- the role of TMDLs within watershed protection and planning activities;
- the development of lists under Section 303(d);
- the relationship of 303(d) lists to other CWA listing requirements;
- the rate and pace of TMDL development;
- the science and tools needed to implement the law and the recommendations; and
- the respective roles and responsibilities of the States, Tribes, and EPA.

To build this consensus, constructive and substantive discussion is needed among the stakeholders, as is the development of a wide range of information to focus and address the substantive concerns. The committee will help develop this consensus by:

- having a membership of motivated individuals with a broad knowledge base concerning the complexities of the issues;
- holding open meetings in which the members address and work toward consensus around the policy issues;
- holding four public meetings in four geographically diverse parts of the country to hear specific public suggestions and concerns on the policy issues; and,
- responding to particular policy issues raised by EPA and other stakeholders.

CHARGE

Strengthening of the TMDL program and its role in watershed management is a critical component of success for the new directions of the national water program. It is in this spirit that the FACA subcommittee is charged to:

1. Recommend ways to improve the effectiveness, efficiency and pace of State, Tribal and EPA TMDL programs under 303(d) of the Clean Water Act;
2. Identify barriers (i.e., in regulations, guidance, technical support, etc.) to success and recommend ways to overcome them;
3. Recommend the appropriate roles of States, Federal agencies, Tribes, and members of the Public to achieve success;
4. Recommend criteria by which to measure the success of each recommendation implemented.

The TMDL committee will include 20 individuals whose depth and breadth of experience enable them to knowledgeably consider multiple areas (e.g., industry, agriculture, environmental public interests, mining, forestry, as well as State, Tribal, and municipal interests) impacted by the committee's decisions. Additionally, these stakeholders were selected based on their experience with and interest in developing consensus recommendations, and their knowledge, expertise, and ability to devise innovative approaches to water quality issues.

The initial meeting will be held in Washington DC. Future meetings may be planned for various geographic areas where the problems are dominant and where local public input can be obtained. EPA anticipates the committee will complete its work within 18 months of its initial meeting.

EPA expects the committee to provide advice on TMDL issues and to prepare a consensus report which identifies stakeholder recommendations in the four areas cited above. It is not the purpose of this committee to recommend changes in the law or appropriations. The committee's recommendations will be presented to the Administrator, the NACEPT and to the Assistant Administrator for Water to use in the formulation of future national TMDL policy, and to measure the success of that policy.

Appendix B: List of Committee Members

FEDERAL ADVISORY COMMITTEE ON TMDLS

Mr. Bob Adler
University of Utah

Mr. Fredric Andes
Sonnenschein Nath & Rosenthal

Mr. John Barrett
Cotton and Grain Producer

Ms. Nina Bell
Northwest Environmental Advocates

Mr. J. Brad Burke
Southern Company Services, Inc.

Ms. Cheryl Creson
Sacramento County (CA) Engineering

Mr. Philip Cummings
The Accord Group

Mr. Dale Givens
Louisiana Department of Environmental Quality

Dr. L.D. McMullen
Des Moines WaterWorks

Mr. William Nielsen
Eau Claire City Council

Ex Officio Members

Mr. Art Bryant
Watershed and Air Management Division,
USDA Forest Service

Mr. John Burt
U.S. Department of Agriculture

Mr. Geoffrey Grubbs
U.S. EPA Office of Wetlands, Oceans, and Watersheds

Ms. Jane Nishida
Maryland Department of the Environment

Mr. Robert Olszewski
The Timber Company

Mr. Richard Parrish
Southern Environmental Law Center

Ms. Danita Rodibaugh
Pork Producer and Grain Farmer

Mr. John Roanhorse
InterTribal Council of Arizona

Ms. Melissa Samet
Earthjustice Legal Defense Fund

Ms. Linda Shead
Galveston Bay Foundation

Ms. Susan L. Sylvester
Wisconsin Department of Natural Resources

Ms. Lydia Taylor
Oregon Department of Environmental Quality

Mr. Ed Wagner
CH2M Hill

Designated Federal Officials

Ms. Hazel Groman
Mrs. Corinne Wellish

Lead Contractor Support

Ms. Martha Prothro
Ross & Associates Environmental Consulting, Ltd.

Mr. Kevin Kratt
Tetra Tech, Inc.

Appendix C: Committee Ground Rules

TMDL ADVISORY COMMITTEE PROCEDURAL PROTOCOLS

I. GOAL

The goal of the Federal TMDL Advisory Committee is to advise the United States Environmental Protection Agency (EPA) on ways to improve the implementation of the Total Maximum Daily Load (TMDL) program under Section 303(d) of the Clean Water Act. The Committee will share and discuss information on the status of the TMDL program and analyze the key issues related to its full implementation. The Committee will prepare a report to EPA containing its advice and recommendations regarding the TMDL program.

II. PARTICIPANTS

a. Additional Members: No new individuals will be added to the Committee unless a Committee member has resigned. In this event, the Assistant Administrator for Water shall appoint a replacement.

b. Attendance at Meetings: A Committee member may be accompanied by such other individuals as the Committee member believes to be appropriate; however, only the Committee member will have the privilege of sitting at the table, speaking during the meetings, and participating in consensus determinations. Committee members are expected to attend all full meetings and participate fully in the Committee's deliberations.

c. Workgroups: Generally, the Committee will operate as a whole. However, some tasks (such as research or drafting) may be better performed by smaller groups. The Committee has discretion to form workgroups to carry out specific assignments from the Committee. Committee members may serve on workgroups; in addition, the Committee may invite outside individuals to attend workgroup meetings or conference calls if it feels particular expertise or perspectives not held by Committee members are needed. Each Committee member will be notified of all workgroup meetings, and is welcome to attend any workgroup meeting or conference call. All workgroup meetings will be held between the Committee sessions, and may be held in person or by teleconference. Workgroups are not authorized to make decisions for the Committee as a whole.

III. DECISION MAKING

a. Consensus:

1. Procedural Matters: The Committee will operate by consensus on procedural matters. Consensus for this purpose may be defined differently by the Committee depending on the significance of the matter being decided. Generally, "consensus" means that all members of the Committee agree they can at least

abide by the proposed approach, even if a member might prefer another approach.

2. Substantive Matters: In developing advice and recommendations for EPA, the Committee will operate by consensus to the extent possible. "Consensus" means that all members of the Committee agree they can accept the proposed position, even if a member might prefer a different position. If consensus is achieved, it will take the form of a written statement that will be appropriately authorized by signature of each member. The Committee will always work toward consensus, avoiding a formal vote; however, should a vote be necessary, the vote tally will be recorded. If consensus cannot be achieved on a substantive matter, majority and significant minority views on that matter will be presented in the Committee's report.

b. Absent Members: The members recognize that emergencies may arise necessitating the absence of a member. In such cases, the members will attempt to be sensitive to the views of the absent member by soliciting input in advance, delaying decisions, or contacting the member during the meeting as appropriate. The absent member may communicate to the facilitator any issue or view that member wishes to convey to the other members. The facilitator will present the absent member's position or view but will not argue for it or vote on behalf of that member.

IV. PROCEDURES

a. Open Meetings: Committee meetings will be open to the public and, if time allows, the Committee may invite members of the public to comment during designated public comment periods. In addition, public workshops may be held in conjunction with scheduled Committee meetings in order to solicit additional public input to Committee deliberations. Workgroup meetings may not be open to the public; however, written workgroup products will be made available to the public and workgroups will report to the full Committee at open meetings. Background materials distributed to all Committee members as well as approved meeting summaries will be available to the public.

b. Meeting Summaries: Draft summaries of Committee meetings will be prepared by the facilitators and approved by the Committee at the following meeting.

c. Agendas: Meeting agendas will be drafted by the facilitator in consultation with EPA and based on the Committee's instructions at the last meeting. The agenda will be reviewed at the beginning of each meeting and may be refined by the Committee.

d. Background Materials: The facilitator (and, on occasion, EPA or other sources) may provide background materials to Committee members in advance of Committee meetings. All requests for, and distribution of, background materials (from EPA or other sources) to all Committee members will occur through the facilitator to ensure equal sharing of information. Members may draft position papers or provide other material to

be circulated through the facilitator. The facilitator must distribute any written information any member of the Committee wishes the Committee as a whole to receive.

e. Thoroughness of Deliberations: During the course of Committee deliberations, every relevant issue raised will be recorded and addressed. To expedite the process, agreed-upon lower priority issues may be recorded and set aside to be dealt with at a later date. If issues raised are not those EPA has identified for Committee deliberation, they will be recorded as such.

V. ROLES AND RESPONSIBILITIES

a. Facilitator: A neutral facilitator will chair the meetings and work with all of the members to ensure that the process runs smoothly. The facilitator serves at the pleasure of the Committee. The role of the facilitator includes developing meeting agendas, focusing discussions, assuring fair opportunity for members to participate in Committee proceedings, working to resolve any impasses that may arise, distributing background materials, preparing meeting summaries, assisting in the location and/or preparation of background materials, distributing documents the Committee or a workgroup develops, assisting workgroups as directed by the Committee, supporting EPA and the Committee in conducting public outreach and assuring appropriate public participation, moderating public workshops, providing assistance to Committee members regarding Committee business between meetings, and other functions as the Committee requests. The facilitator will also assist the Committee in preparing its final report (editing and distributing drafts, compiling comments, etc.), although the Committee is solely responsible for developing the content.

b. Committee Members: Committee members are expected to attend all full Committee meetings. In addition, members may be asked to participate in several public meetings that may be held immediately following certain Committee meetings to obtain additional public input on TMDL activities. All members agree to act in good faith in all aspects of the Committee's deliberations. Committee members are expected to present their own personal opinions based on their experience, perspective, and training, and to work constructively and collaboratively with other members toward reaching consensus. Personal attacks and prejudiced statements will not be tolerated at any time during the process.

c. EPA Staff: EPA staff will be responsible for briefing the Committee about technical or programmatic issues (and/or preparing background materials), as requested by the Committee through the facilitator. EPA staff will also attend the meetings and be available to answer programmatic or technical questions posed by the Committee. EPA staff are also responsible for identifying issues on which Committee advice is sought, as well as any issues on which Committee advice is not sought (should such issues arise).

d. Ex Officio Panel of Federal Representatives: Three federal agency representatives, including one from EPA and two others to be selected by EPA, will participate in

Committee discussions as *ex officio* Committee members. The federal representatives will provide policy and program information and advice to the Committee and support the Committee's overall efforts; they will not participate in consensus determinations or sign the Committee's final report to EPA.

VI. SAFEGUARDS

a. Right to Withdraw: Any member may withdraw from the Committee at any time without prejudice.

b. Other's Positions: By participating, members agree that they are entering into a covenant of mutual respect and professional courtesy. When speaking in outside public forums, each member may express his or her point of view about the issues before the Committee; however, members agree not to report, by name, any other member's position or point of view. The members also agree that they will not publicly predict the outcome of the Committee's deliberations.

c. Information:

1. All members agree to openly exchange relevant information that is readily available to them. If a member believes he or she cannot or should not release relevant information, the member will provide the substance of the information in some form (such as by aggregating data, by deleting non-relevant confidential information, by providing summaries, or by furnishing it to the facilitator to use or abstract) or a general description of it and the reason for not providing it directly.

2. Members will provide information as much in advance of the meeting at which it is to be discussed as is reasonably possible.

3. Information and data provided to the Committee are a matter of public record.

4. The Committee does not have authority to protect confidential business information (CBI). When information required for Committee deliberations can only be derived from CBI (i.e., innovative technology, cost, or pricing information), the information may only be received by the Committee in aggregate form so as to protect specific CBI from release.

5. No member is expected to share advance information on its plans or strategy for filing or defending against litigation over TMDL issues. No member is expected to share any information that is subject to attorney/client privilege.

d. Press: Representatives from the press may attend Committee meetings. The press may also ask members to comment or answer questions about the Committee's business. Committee members agree that each member may offer his or her individual perspective;

each member agrees not to attribute positions or views to other members by name, nor predict the outcome of the Committee's deliberations. To ensure consistency and accuracy in reporting on general Committee operations, members are encouraged to direct press inquiries concerning overall Committee plans and procedures to EPA's Designated Federal Official for the Committee.

VII. PRODUCTS

a. Meeting Summaries: The facilitator will prepare and distribute draft meeting summaries following each meeting. These meeting summaries will be reviewed by Committee members at the following meeting; upon unanimous approval, they will become work products of the Committee.

b. Final Report: The Committee will prepare, with the assistance of the facilitator, a draft and final consensus report, which: reviews issues discussed; provides advice (recommendations) to EPA on issues for which there was agreement (and supplies a rationale for this advice); discusses areas of disagreement; describes significant minority views; and identifies any remaining unresolved issues. The format, authorship, and precise content of this report will be determined by the Committee itself, although EPA may request a specific format. All Committee members will have the opportunity to review and comment upon the draft report. All Committee members will be asked to sign the final report.

VIII. MEETING PLANS

a. Number of Meetings: There will be a minimum of five two or three day full Committee meetings which are expected to occur in the 18 month period beginning with the first meeting. Beginning with the second full Committee meeting, public meetings to solicit additional input on TMDL issues may be scheduled to take place immediately following the Committee's meeting. In consultation with EPA, the Committee will determine the scheduling of the meetings and the need for any additional meetings. The Committee will also determine the timing and number of workgroup meetings, if any. Workgroup meetings cannot occur during full Committee meetings.

b. Location of Meetings: A minimum of one full Committee meeting will occur in Washington, DC. The remaining full Committee meetings are expected to be at different locations around the country, as determined by the Committee in consultation with EPA.

IX. DEFINING "CONSENSUS" AND ADDRESSING DIVERSE VIEWS

(Addendum to the Procedural Protocols ("Ground Rules") of the Federal Advisory Committee on the TMDL Program. Agreed upon by Committee members in Salt Lake City on 1/21/98.)

Defining Consensus:

- In accordance with the preference expressed in the current Ground Rules, the Committee should continue to operate by general consensus rather than by vote as much as possible.

- However, the facilitator or any member may call for a vote on a specific recommendation on which discussion has been substantially exhausted and consensus is in doubt.

- When a vote is called for, members will be asked to indicate whether they agree, disagree, or (while not necessarily agreeing) "can live" with the recommendation.

- A recommendation will be adopted as a Committee recommendation when 18 or more members agree or can live with the recommendation.

- A vote may also be called for on related recommendations where this might allow for greater agreement than a vote on only one separate recommendation.

Diverging Views:

- The Committee should continue to work towards consensus and minimize differences as much as possible.

- However, where agreement cannot be achieved, the Committee will treat diverse views in a consistent manner. For example:

  a. The Committee is divided on a very important issue after discussing it in depth. The report will summarize in a balanced and objective manner the most significant views of members on any issue for which a recommendation garners 10 or more votes but does not pass by supermajority. The discussion will be included in an appropriate section/chapter of the report. *(Note: a very limited number of major issues may also be addressed in some manner in an appendix.)*

  b. Member(s) wish to file a minority report. Generally, minority reports are discouraged since they can detract from the consensus recommendations. However, minority reports are allowed and will be included as appendices to the report in two circumstances:

     1. where the member(s) voted against a recommendation that carried by a supermajority of 18, and

     2. where the member(s) voted for a recommendation that did not pass and also did not garner the 10 votes needed for an issue to be included for discussion under (a) above.

Minority reports should be as brief as possible but no longer than 3 pages per issue; all members wishing to dissent on the issue should join in the minority report.

c. The Committee is divided on an issue but has not discussed it in depth and/or one or more members have raised a substantive issue but it has not been addressed by the full Committee. A list of any such issues will be included in the report. In addition, any member(s) may submit to the facilitators a proposal of up to two pages on any issue not addressed in the facilitated process. The facilitators will circulate any such proposal to all other members for concurrence. If 14 members concur with the proposal, it will be circulated with the next draft report for further consideration. If 18 members concur with the proposal, it will be included in the next draft report as a proposal/placeholder for approval at the final meeting. Any such proposals that ultimately do not garner the necessary 18 concurrences will be listed in the report.

Appendix D: Contractor Information

TETRA TECH, INC.

Tetra Tech provides comprehensive engineering and consulting services focusing on innovative solutions to complex environmental problems. These services include client sponsored research and development, environmental assessment and permitting, engineering, construction management, remedial design and remediation. Tetra Tech believes its strong research and development capabilities and extensive technical expertise allow it to provide innovative and cost-effective solutions to its clients' environmental problems. While maintaining a focus on water quality issues since our founding in 1966, we have been at the forefront of developing effective solutions to address current environmental challenges. As new environmental issues have appeared over the past three decades, Tetra Tech has responded by developing the capabilities to address those concerns with scientifically sound, cost-effective solutions.

Tetra Tech's experienced professionals serve our customers from over 70 offices. In the public sector, we serve the Environmental Protection Agency; the Department of Defense; the Department of Energy; and other federal, state and local government agencies concerned with environmental protection. In the private sector, our clients include major aerospace, pharmaceutical, mining, manufacturing, and high technology companies.

ROSS & ASSOCIATES ENVIRONMENTAL CONSULTING, LTD.

Ross & Associates Environmental Consulting, Ltd. Is an environmental and natural resources consulting firm located in Seattle, Washington. The firm was founded in 1987 by Bill Ross, the former Commissioner of the Alaska Department of Environmental Conservation.

Ross & Associates provides facilitation and mediation services, policy development, strategic analysis, and management consulting, primarily for public agency clients. It specializes in assisting clients to comprehend the full depth of the issues in question, and to develop and implement policies and strategies to address or resolve them. The range of services the firm provides includes management information system development; economic and technical analysis; regulatory and statutory review; public communications and involvement; and intergovernmental consultation, mediation, and facilitation. The firm is particularly skilled in innovative environmental programs, and addressing problems from a holistic ecosystem point of view. The strengths of the firm are focused upon assisting clients to formulate strategies for policy development and institutional change to meet the challenges of today's, and tomorrow's, critical environmental issues.

Appendix E: Unaddressed Issues

Because of time limitations, the Committee could not address all issues related to the TMDL program. Issues identified by individual members as important to them but not addressed by the Committee are listed below.

1. Federal Coordination: The report implies that many federal agencies have a role in protecting water quality (Chapter 10.1, recommendation 3), but the Committee did not have time to discuss or make recommendations regarding EPA's potential role under §313 of the Clean Water Act in ensuring that all federal agencies "engaged in any activity which may result in the discharge or runoff of pollutants" not cause or contribute to violations of water quality standards.

2. Judicial Review: The TMDL (particularly the WLA component) is a binding legal determination for which judicial review must be available, at a minimum, through State administrative procedure statutes.

3. Details of and distinctions in the iterative process, including TMDLs designed to be phased, revised TMDLs, revised implementation plans, and revised controls.

4. The relationship between current schedules for TMDL development and §303(d)(1) lists that are growing.

5. Procedures for interim delisting.

6. The need for federal consistency and details of data quality (e.g., age, percent exceedances, etc.) and sources of data that are used for listing.

7. A consistent and detailed priority ranking methodology.

8. How TMDLs should address multiple pollutants and/or stressors.

9. Methods of improving the antidegradation policy program, including how antidegradation plays a role in TMDL development and §303(d)(1) lists.

10. Areas of uncertainty in the TMDL program that impact sources and environmental protection, and the need to devise solutions that decrease uncertainty.

11. Timing of measuring the net progress on water quality improvements from stabilization plans and the interplay between the "prohibition" and TMDL development and implementation.

12. The details of needed tracking methods for TMDL development, implementation, follow-up monitoring, attainment of allocations, interim targets, and water quality standards.

13. Ways of addressing complex equity issues (e.g., allocation schemes between new cleaner sources and older dirtier sources, regulated and unregulated nonpoint sources, upstream and downstream).

14. Importance of complex work planning to timely development of TMDLs and maintenance of overall schedules.

15. Role of TMDLs in remedying issues of environmental injustice, including the subsistence level consumption of contaminated fish by low income, immigrant and ethnic populations and other forms of pollution affecting subpopulations.

16. The importance of EPA standardizing required components of the TMDL program in order to enhance approvability, ease of approval, and efficiency, including list presentation, TMDL development, application of narrative criteria, details of the watershed characterization/stabilization plan, etc.

17. The need to strike a balance between national consistency and state flexibility, particularly in the face of insufficient resources.

18. Clarity on details of and sufficiency of surrogate measures in TMDLs.

19. Sufficiency of detail in source identification (broad categories, individual sources).

20. Importance of collecting adequate flow data corresponding to water quality monitoring.

21. Consequences of state/stakeholder failures to implement TMDLs.

22. Methods of protecting aquatic wildlife from toxic pollutants through TMDLs, including protection from sublethal effects.

23. Connection between the TMDL program and expeditious attainment of allocations for stormwater.

24. Establishing the definition of “priority ranking” (i.e., high/medium/low versus ranked) and methods to drive consistency in priority ranking by states.

Appendix F: Statutory and Regulatory Language

FEDERAL WATER POLLUTION CONTROL ACT
Section 303(d)

(1)(A) Each State shall identify those waters within its boundaries for which the effluent limitations required by section 301(b)(1)(A) and section 301(b)(1)(B) are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters.

(B) Each State shall identify those waters or parts thereof within its boundaries for which controls on thermal discharges under section 301 are not stringent enough to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife.

(C) Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 304(a)(2) as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

(D) Each State shall estimate for the waters identified in paragraph (1)(B) of this subsection the total maximum daily thermal load required to assure protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife. Such estimates shall take into account the normal water temperatures, flow rates, seasonal variations, existing sources of heat input, and the dissipative capacity of the identified waters or parts thereof. Such estimates shall include a calculation of the maximum heat input that can be made into each such part and shall include a margin of safety which takes into account any lack of knowledge concerning the development of thermal water quality criteria for such protection and propagation in the identified waters or parts thereof.

(2) Each State shall submit to the Administrator from time to time, with the first such submission not later than one hundred and eighty days after the date of publication of the first identification of pollutants under section 304(a)(2)(D), for his approval the waters identified and the loads established under paragraphs (1)(A), (1)(B), (1)(C), and (1)(D) of this subsection. The Administrator shall either approve or disapprove such identification and load not later than thirty days after the date of submission. If the Administrator approves such identification and load, such State shall incorporate them into its current plan under subsection (e) of this section. If the Administrator disapproves such identification and load, he shall not later than thirty days after the date of such disapproval identify such waters in such State and establish such loads for such waters as he determines necessary to implement the water quality standards applicable to such waters and upon such identification and establishment the State shall incorporate them into its current plan under subsection (e) of this section.

(3) For the specific purpose of developing information, each State shall identify all waters within its boundaries which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margins of safety, for those pollutants which the Administrator identifies under section 304(a)(2) as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish and wildlife.

(4) LIMITATIONS ON REVISION OF CERTAIN EFFLUENT LIMITATIONS.--

(A) STANDARD NOT ATTAINED.--For waters identified under paragraph (1)(A) where the applicable water quality standard has not yet been attained, any effluent limitation based on a total maximum daily load or other waste load allocation established under this section may be revised only if (i) the cumulative effect of all such revised effluent limitations based on such total maximum daily load or waste load allocation will assure the attainment of such water quality standard, or (ii) the designated use which is not being attained is removed in accordance with regulations established under this section.

(B) STANDARD ATTAINED.--For waters identified under paragraph (1)(A) where the quality of such waters equals or exceeds levels necessary to protect the designated use for such waters or otherwise required by applicable water quality standard, any effluent limitation based on a total maximum daily load or other waste load allocation established under this section, or any water quality standard established under this section, or any other permitting standard may be revised only if such revision is subject to and consistent with the antidegradation policy established under this section.

Regulatory Language

TITLE 40--PROTECTION OF ENVIRONMENT
CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY

Sec. 122.2 Definitions.
(excerpt)

New discharger means any building, structure, facility, or installation:
(a) From which there is or may be a "discharge of pollutants;"
(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;
(c) Which is not a "new source;" and
(d) Which has never received a finally effective NDPES permit for discharges at that "site."

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any
offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be an area or biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR 125.122 (a) (1) through (10). An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:
(a) After promulgation of standards of performance under section 306 of CWA which are applicable to such source, or
(b) After proposal of standards of performance in accordance with section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

[48 FR 14153, Apr. 1, 1983, as amended at 48 FR 39619, Sept. 1, 1983; 50 FR 6940, 6941, Feb. 19, 1985; 54 FR 254, Jan. 4, 1989; 54 FR 18781, May 2, 1989; 54 FR 23895, June 2, 1989; 58 FR 45039, Aug. 25, 1993; 58 FR 67980, Dec. 22, 1993]

Sec. 122.4 Prohibitions (applicable to State NPDES programs, see Sec. 123.25).

No permit may be issued:

(a) When the conditions of the permit do not provide for compliance with the applicable requirements of CWA, or regulations promulgated under CWA;

(b) When the applicant is required to obtain a State or other appropriate certification under section 401 of CWA and Sec. 124.53 and that certification has not been obtained or waived;

(c) By the State Director where the Regional Administrator has objected to issuance of the permit under Sec. 123.44;

(d) When the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States;

(e) When, in the judgment of the Secretary, anchorage and navigation in or on any of the waters of the United States would be substantially impaired by the discharge;

(f) For the discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste;

(g) For any discharge inconsistent with a plan or plan amendment approved under section 208(b) of CWA;

(h) For any discharge to the territorial sea, the waters of the contiguous zone, or the oceans in the following circumstances:

(1) Before the promulgation of guidelines under section 403(c) of CWA (for determining degradation of the waters of the territorial seas, the contiguous zone, and the oceans) unless the Director determines permit issuance to be in the public interest; or

(2) After promulgation of guidelines under section 403(c) of CWA, when insufficient information exists to make a reasonable judgment whether the discharge complies with them.

(i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by sections 301(b)(1)(A) and 301(b)(1)(B) of CWA, and for which the State or interstate agency has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate, before the close of the public comment period, that:

(1) There are sufficient remaining pollutant load allocations to allow for the discharge; and

(2) The existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards.

[48 FR 14153, Apr. 1, 1983, as amended at 50 FR 6940, Feb. 19, 1985]

Sec. 122.44 (d)(1)(vii)

(vii) When developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that:

(A) The level of water quality to be achieved by limits on point sources established under this paragraph is derived from, and complies with all applicable water quality standards; and

(B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.

[48 FR 14153, Apr. 1, 1983, as amended at 49 FR 31842, Aug. 8, 1984; 49 FR 38049, Sept. 26, 1984; 50 FR 6940, Feb. 19, 1985; 50 FR 7912, Feb. 27, 1985; 54 FR 256, Jan. 4, 1989; 54 FR 18783, May 2, 1989; 54 FR 23895, June 2, 1989; 57 FR 11413, Apr. 2, 1992; 57 FR 33049, July 24, 1992; 60 FR 15386, Mar. 23, 1995]

Sec. 130.7 Total maximum daily loads and individual water quality-based effluent limitations.

(a) General. The process for identifying water quality limited segments still requiring wasteload allocations, load allocations and total maximum daily loads (WLAs/LAs and TMDLs), setting priorities for developing these loads; establishing these loads for segments identified, including water quality monitoring, modeling, data analysis, calculation methods, and list of pollutants to be regulated; submitting the State's list of segments identified, priority ranking, and loads established (WLAs/LAs/TMDLs) to EPA for approval; incorporating the approved loads into the State's WQM plans and NPDES permits; and involving the public, affected dischargers, designated areawide agencies, and local governments in this process shall be clearly described in the State Continuing Planning Process (CPP).

(b) Identification and priority setting for water quality-limited segments still requiring TMDLs.

(1) Each State shall identify those water quality-limited segments still requiring TMDLs within its boundaries for which:

(i) Technology-based effluent limitations required by sections 301(b), 306, 307, or other sections of the Act;

(ii) More stringent effluent limitations (including prohibitions) required by either State or local authority preserved by section 510 of the Act, or Federal authority (law, regulation, or treaty); and

(iii) Other pollution control requirements (e.g., best management practices) required by local, State, or Federal authority are not stringent enough to implement any water quality standards (WQS) applicable to such waters.

(2) Each State shall also identify on the same list developed under paragraph (b)(1) of this section those water quality-limited segments still requiring TMDLs or parts thereof within its boundaries for which controls on thermal discharges under section 301 or State or local requirements are not stringent enough to assure protection and propagation of a balanced indigenous population of shellfish, fish and wildlife.

(3) For the purposes of listing waters under Sec. 130.7(b), the term “water quality standard applicable to such waters” and “applicable water quality standards” refer to those water quality standards established under section 303 of the Act, including numeric criteria, narrative criteria, waterbody uses, and antidegradation requirements.

(4) The list required under Secs. 130.7(b)(1) and 130.7(b)(2) of this section shall include a priority ranking for all listed water quality-limited segments still requiring TMDLs, taking into account the severity of the pollution and the uses to be made of such waters and shall identify the pollutants causing or expected to cause violations of the applicable water quality standards. The priority ranking shall specifically include the identification of waters targeted for TMDL development in the next two years.

(5) Each State shall assemble and evaluate all existing and readily available water quality-related data and information to develop the list required by Secs. 130.7(b)(1) and 130.7(b)(2). At a minimum “all existing and readily available water quality-related data and information” includes but is not limited to all of the existing and readily available data and information about the following categories of waters:

(i) Waters identified by the State in its most recent section 305(b) report as "partially meeting" or "not meeting" designated uses or as "threatened";

(ii) Waters for which dilution calculations or predictive models indicate nonattainment of applicable water quality standards;

(iii) Waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academicinstitutions. These organizations and groups should be actively solicited for research they may be conducting or reporting. For example,
university researchers, the United States Department of Agriculture, the National Oceanic and Atmospheric Administration, the United States Geological Survey, and the United States Fish and Wildlife Service are good sources of field data; and

(iv) Waters identified by the State as impaired or threatened in a nonpoint assessment submitted to EPA under section 319 of the CWA or in any updates of the assessment.

(6) Each State shall provide documentation to the Regional Administrator to support the State's determination to list or not to list its waters as required by Secs. 130.7(b)(1) and 130.7(b)(2). This documentation shall be submitted to the Regional Administrator together
with the list required by Secs. 130.7(b)(1) and 130.7(b)(2) and shall include at a minimum:

(i) A description of the methodology used to develop the list; and

(ii) A description of the data and information used to identify waters, including a description of the data and information used by the State as required by Sec. 130.7(b)(5); and

(iii) A rationale for any decision to not use any existing and readily available data and information for any one of the categories of waters as described in Sec. 130.7(b)(5); and

(iv) Any other reasonable information requested by the Regional Administrator. Upon request by the Regional Administrator, each State must demonstrate good cause for not including a water or waters on the list. Good cause includes, but is not limited to, more recent or accurate data; more sophisticated water quality modeling; flaws in the original analysis that led to the water being listed in the categories in Sec. 130.7(b)(5); or changes in conditions, e.g., new control
equipment, or elimination of discharges.

(c) Development of TMDLs and individual water quality based effluent limitations.

(1) Each State shall establish TMDLs for the water quality limited segments identified in paragraph (b)(1) of this section, and in accordance with the priority ranking. For pollutants other than heat, TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. Determinations of TMDLs shall take into account critical conditions for stream flow, loading, and water quality parameters.

(i) TMDLs may be established using a pollutant-by-pollutant or biomonitoring approach. In many cases both techniques may be needed. Site-specific information should be used wherever possible.

(ii) TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards as identified pursuant to paragraph (b)(1) of this section. Calculations to establish TMDLs shall be subject to public review as defined in the State CPP.

(2) Each State shall estimate for the water quality limited segments still requiring TMDLs identified in paragraph (b)(2) of this section, the total maximum daily thermal load which cannot be exceeded in order to assure protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife. Such estimates shall take into account the normal water temperatures, flow rates, seasonal variations, existing sources of heat input, and the dissipative capacity of the identified waters or parts thereof. Such estimates shall include a calculation of the maximum heat input that can be made into each such part

and shall include a margin of safety which takes into account any lack of knowledge concerning the development of thermal water quality criteria for protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in the identified waters or parts thereof.

(d) Submission and EPA approval.

(1) Each State shall submit biennially to the Regional Administrator beginning in 1992 the list of waters, pollutants causing impairment, and the priority ranking including waters targeted for TMDL development within the next two years
as required under paragraph (b) of this section. For the 1992 biennial submission, these lists are due no later than October 22, 1992. Thereafter, each State shall submit to EPA lists required under paragraph (b) of this section on April 1 of every even-numbered year. The list of waters may be submitted as part of the State's biennial water quality report required by Sec. 130.8 of this part and section 305(b) of the CWA or submitted under separate cover. All WLAs/LAs and
TMDLs established under paragraph (c) for water quality limited segments shall continue to be submitted to EPA for review and approval. Schedules for submission of TMDLs shall be determined by the Regional Administrator and the State.

(2) The Regional Administrator shall either approve or disapprove such listing and loadings not later than 30 days after the date of submission. The Regional Administrator shall approve a list developed under Sec. 130.7(b) that is submitted after the effective date of this rule only if it meets the requirements of Sec. 130.7(b). If the Regional Administrator approves such listing and loadings, the State shall incorporate them into its current WQM plan. If the Regional
Administrator disapproves such listing and loadings, he shall, not later than 30 days after the date of such disapproval, identify such waters in such State and establish such loads for such waters as determined necessary to implement applicable WQS. The Regional Administrator shall promptly issue a public notice seeking comment on such listing and loadings. After considering public comment and making any revisions he deems appropriate, the Regional Administrator shall transmit the listing and loads to the State, which shall incorporate them into its current
WQM plan.

(e) For the specific purpose of developing information and as resources allow, each State shall identify all segments within its boundaries which it has not identified under paragraph (b) of this
section and estimate for such waters the TMDLs with seasonal variations and margins of safety, for those pollutants which the Regional Administrator identifies under section 304(a)(2) as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish and wildlife. However, there is no requirement for such loads to be submitted to EPA for approval, and establishing TMDLs for those waters identified in paragraph (b) of this section shall be given higher priority.

[50 FR 1779, Jan. 11, 1985, as amended at 57 FR 33049, July 24, 1992]

Appendix G: Outline of the Hierarchy Approach to TMDL Approval (With Examples)

INTRODUCTION

The following proposal addresses the fundamental problem of TMDL approval: that different aspects of TMDLs vary in the degree to which they can be rigorously quantified. This variability applies to different types of TMDLs, different types of problems that TMDLs seek to address, and pollution from different types of sources. Moreover, there may be differences in the degree to which separate components of the TMDL process require or are amenable to quantification, including the degree to which use impairment can be attributed to a particular pollutant or other type of pollution, the degree to which water quality conditions deviate from a water quality standard or other desired norm, the degree to which the deviation can be attributed to specific sources or categories of sources, the degree to which a precise "load allocation" can be assigned to individual sources, and the degree to which such load allocations can be correlated with specific remedial measures. Similar issues apply to the degree of subsequent monitoring and follow-up actions required, as well as the level of required EPA oversight**.** However, flexibility to account for different circumstances does not translate to unbounded discretion based on subjective judgments or unrestricted differences in interpretation. Rather, different circumstances should be addressed through a set of determinate, objective criteria (that is, *objective* as opposed to *subjective* flexibility).

The following proposal suggests the same basic "hierarchy" approach to each type of variability. The degree of quantitative rigor that is possible should not be viewed as an absolute (all-or-nothing) determination. Some reasonable minimum amount of reliable data is always needed in TMDL development. If the highest level of quantitative rigor is not possible, an intermediate level of rigor should be considered (the "next-best" approach). At the same time, there is a logical relationship between the degree of rigor possible in the early phases of the TMDL process and the degree of rigor required in the subsequent monitoring, revision and follow-up phases of the process (the concept of inverse proportionality). When types of TMDLs and TMDL components are amenable to quantification with a high degree of certainty, the need for supplemental or related implementation rigor is relatively low. By contrast, when the type of TMDL and TMDL component is not amenable to precise quantification, or when that quantification is subject to considerable uncertainty, the degree of rigor associated with supplemental or associated implementation measures increases.

The hierarchy approach, in turn, suggests that the TMDL approval and revision process be divided into a series of related steps; each of which should involve ample opportunities for public participation and stakeholder involvement. Issues involving approval procedures will be identified and addressed separately.

Step 1 - Target Identification. Identification of the pollutant or other type of pollution, and quantification of the target (or "desired end-point") of the TMDL process.

Step 2 - Identification of Variance from Target. Quantification as early as possible, based on all readily available information (including information on flow conditions, existing water quality, pollution

loads and other factors) or additional monitoring where necessary, of the degree to which conditions in the water body deviate from the desired target or end-point.

Step 3 - Source Identification. Identification as early as possible of the responsible sources or categories of sources of pollution, and the degree to which each source (or category of source) contributes to the problem, with additional monitoring if needed to support fair and adequate load allocations.

Step 4 - Pollution Reduction Allocation. Allocation of pollutant loads (including pollution reduction responsibilities) among the identified sources and other factors, including wasteload allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources or categories of nonpoint sources, the statutorily-prescribed margin of safety (MOS), and any allocation for future growth, potentially with seasonal variations or other factors to address variable flow conditions.

Step 5 - Identification of Implementation Methods. Specification and quantification of the implementation tools and methods that will be used to achieve the prescribed allocations.

Step 6 - Monitoring and Assessment of Effectiveness. Monitoring and assessment to determine the degree of use attainment, remaining variance from the target, degree of compliance with implementation methods, verification of pollution source identification and potentially identification of additional sources or categories of sources.

Step 7 - TMDL Revision (if necessary). Where necessary, in response to step 6, revision as appropriate of the applicable pollution reduction allocations and implementation methods.

[Continue steps 6 and 7 until use impairment is eliminated (target is achieved).]

Suggestions for how this hierarchy approach might be applied to each issue, along with some examples where needed for purposes of clarification, are given below. It should be noted that the examples provided here are for explanatory purposes only. EPA must ultimately determine (through guidance or other tools) the way in which the hierarchy approach (the principles described here) should be applied in making individual TMDL development and approval decisions.

STEP 1 — TARGET IDENTIFICATION

Proposed rigor hierarchy and associated proportionality requirements:

1. When the impairment can be tied to a specific pollutant with an existing numeric criterion, that pollutant and that criterion should be used to develop the TMDL. Use of an existing numeric criterion should be presumed to be adequate, so long as subsequent monitoring verifies post-implementation compliance with the criterion and elimination of the use impairment.

Example: Toxicity to fish is found to be caused by residual chlorine from disinfection, and a specific numeric criterion for chlorine is included in the WQS.

2. When the impairment can be tied to a specific pollutant without an existing numeric criterion, a criterion should be developed wherever possible (either state-wide or on a site-specific basis) and used to develop the TMDL. Use of a new numeric criterion should require additional post-implementation verification that the new criterion is adequate to address the problem. If not, a procedure should be in place to modify the criterion and to impose additional remedial measures to meet the new criterion.

Example: Toxicity to fish is found to be caused by residual chlorine from disinfection, for example, through whole effluent toxicity testing, but no specific numeric criterion for chlorine is included in the WQS. The state should develop a chlorine WQC, or a site-specific criterion for chlorine.

3. When the impairment is tied to a pollutant for which a numeric criterion is not possible, or where the impairment is identified but cannot be attributed to a single traditional "pollutant," the state should try to identify another (surrogate) environmental indicator that can be used to develop a quantified TMDL, using numeric analytical techniques where they are available, and best professional judgment (BPJ) where they are not. The criterion must be designed to meet water quality standards, including the waterbody's designated uses. The use of BPJ does not imply lack of rigor; it should make use of the "best" scientific information available, and should be conducted by "professionals." When BPJ is used, care should be taken to document all assumptions, and BPJ-based decisions should be clearly explained to the public at the earliest possible stage.

If they are used, surrogate environmental indicators should be clearly related to the water quality standard that the TMDL is designed to achieve. Use of a surrogate environmental parameter should require additional post-implementation verification that attainment of the surrogate parameter results in elimination of the impairment. If not, a procedure should be in place to modify the surrogate parameter or to select a different or additional surrogate parameter and to impose additional remedial measures to eliminate the impairment.

Example: A stream suffers from elevated temperature that cannot be traced to thermal discharges. The divergence from the numeric temperature criterion (delta T) is useful to quantify the divergence from the WQS, but is not useful in developing restoration strategies. Instead, the state determines that healthy streams of similar types are characterized by X percent more stream side cover vegetation. This differential is established as the numeric goal of the TMDL.

4. When impairment cannot be tied to either a specific pollutant or to a surrogate environmental parameter, the state should try to identify a quantifiable set of remedial measures that it believes, using numeric analytical techniques when they are available or best professional judgment when they are not, are likely to eliminate the impairment. Use of a numeric standard based on implementation of specified remedial measures should require additional post-implementation verification that attainment of the measures results in elimination of the impairment. If not, a procedure should be in place to modify the measures or to select and to impose different or additional measures to eliminate the impairment.

Example: A stream suffers from excess sedimentation, but because the total annual sediment load is less important than peak loads during certain critical storm events and seasons, it is not possible or useful to establish a TMDL based on total sediment load reductions. Instead, the state identifies the percent of the streambank that needs to be stabilized and revegetated in order to eliminate the impairment.

5. When the impairment can be tied to multiple pollutants, the state should either: (a) establish a multi-parameter TMDL that accounts for any additive or synergistic effects, if adequately documented; (b) determine which of the pollutants is most dominant or limiting under the circumstances, and develop the TMDL based on that pollutant; or (c) identify an indicator pollutant that can be used to define the numeric goals of the TMDL. Use of a multiple parameter, indicator pollutant or dominant pollutant criterion should require additional post-implementation verification that the criterion is adequate to address the problem. If not, a procedure should be in place to modify the criterion and to impose additional remedial measures to meet the new criterion.

Example: A lake is eutrophying due to loads of nitrogen, phosphorus, or both. The state could either: (a) establish a trophic status index based on the multiple pollutants; (b) conduct a study that indicates that nitrogen is the limiting pollutant and establish a TMDL based on that pollutant; or (c) establish a TMDL based on an indicator of harm such as chlorophyll A levels.

STEP 2 — IDENTIFICATION OF VARIANCE FROM TARGET

Proposed rigor hierarchy and associated proportionality requirements:

1. Where existing monitoring data are sufficient to quantify the degree to which conditions in the water body deviate from the target identified in Step 1, that degree of variance should be used to establish pollution reduction allocations (Step 4). Where deviation from the target is variable (as is likely in most cases), a conservative variance level should be used to establish pollution reduction targets. An overall pollution reduction target based on adequate existing data should be presumed sufficient, subject to subsequent verification of compliance with the target and use attainment.

Example: Existing data show that the water body has dissolved oxygen levels that range from 3.0 to 4.0 mg/L, compared to a WQS of 5.0 mg/L. The degree of variance from the standard should be 2.0 mg/L.

2. Where existing monitoring data are not sufficient to quantify the degree to which conditions in the water body deviate from the target identified in Step 1, additional monitoring should be conducted in order to establish the necessary pollution reduction targets. An overall pollution reduction target based on adequate new data should be presumed sufficient, subject to subsequent verification of compliance with the target and use attainment.

Example: Same as above using newly-collected data.

3. Where it is not technically feasible to collect monitoring data adequate to quantify the existing deviation from the target, or where the target chosen is not amenable to such quantification, best professional judgment or indirect methods should be used to estimate the degree to which the water body deviates from the target. In such cases, additional monitoring will be needed to confirm the adequacy of the surrogate targets chosen, with revisions as necessary to eliminate use impairment.

Example: Spawning beds are impaired due to excess deposition of fine sediments, but it is not possible to monitor fine sediment runoff levels precisely, or to estimate the load reductions necessary to restore the spawning beds. Instead, stream bank restoration and logging road stabilization projects will be undertaken in an effort to reduce sediment loads. Best professional judgment should be used to estimate the necessary number of miles of stream banks and roads that must be restored or stabilized. Subsequent monitoring and assessment of spawning habitat and success will be needed to ascertain the adequacy of the restoration and stabilization targets.

STEP 3 — SOURCE IDENTIFICATION

Proposed rigor hierarchy and associated proportionality requirements:

1. When the target violation or use impairment is known to be caused exclusively by one or more known sources, and adequate existing data are available to quantify the percentage of pollution caused by those sources, pollution reduction allocations can be made based on that information. In such cases, it should be presumed that pollution reductions by those sources will be adequate to attain the target and eliminate use impairment. If additional pollution sources are found, the allocation may be, but does not necessarily have to be, revised; for example: (a) additional pollution reductions can be required from those sources to provide an additional margin of safety and equity among sources; (b) potential pollution reductions from those sources can be identified and implemented if the initial scheduled reductions are inadequate to attain the target and eliminate use impairment; or © the existing allocations can be modified to account for the new expected pollution reductions so long as total projected reductions remain adequate to meet the target.

Example: Excess nitrogen loads to a river are known to be caused by discharges from two factories and two sewage treatment plants, and accurate data are available on the total mass of nitrogen coming from each source.

2. When some pollution sources are known, and existing data are available to quantify the percentage of pollution caused by those sources, but it is known or expected that additional pollution sources exist, additional monitoring and source identification should be conducted to identify the remaining sources. If such sources can be identified readily and quickly, pollution reduction allocations can be made based on that information. In such cases, it should be presumed that pollution reductions by those sources will be adequate to attain the target and eliminate use impairment. If not all sources and source contributions can be identified quickly, preliminary pollution reduction allocations adequate to meet the target and eliminate use impairment should be made based on existing information. If

additional pollution sources are found, the allocation may be, but does not necessarily have to be, revised; for example: (a) additional pollution reductions can be required from those sources to provide an additional margin of safety and equity among sources; (b) potential pollution reductions from those sources can be identified and implemented if the initial scheduled reductions are inadequate to attain the target and eliminate use impairment; or (c) the existing allocations can be modified to account for the new expected pollution reductions so long as total projected reductions remain adequate to meet the target.

Example: Same as above, but it is expected that additional nitrogen loadings derive from sanitary sewer overflow points. Additional monitoring and investigation could determine the location of such discharge points, along with appropriate remediation strategies.

3. If the responsible pollution sources are known, but inadequate data exist to quantify the amount of pollution caused by each source or category of source, additional monitoring should be conducted, where technically feasible, to quantify pollution contributions. Pollution reduction allocations should be made based on that new information, subject to later verification of target attainment and elimination of use impairment.

Example: Same as above, but additional, unknown concentrations of nitrogen are being released by small, package treatment plants for which extensive monitoring has not been performed. Additional monitoring should be able to identify these additional loadings quickly and with relative certainty.

4. If the responsible pollution sources are known, but it is infeasible or impossible to quantify the amount of pollution caused by each source or category of source with precision, estimated pollution contributions should be determined based on best professional judgment, and pollution reduction allocations should be made based on those estimates. Although based on the best science and all available data, such estimates should be subject to more detailed ambient monitoring to determine the effectiveness of pollution controls in reducing ambient pollution, along with verification of target attainment and elimination of use impairment.

Example: Same as above, but it is expected that additional nitrogen derives from runoff from known areas of row crop agriculture. While it may not be feasible to conduct accurate “edge-of-field” monitoring to quantify such additional loadings precisely, information on crop mixtures, acreage, fertilizer application rates and methods, soil types, slopes, hydrologic data, etc., can be used to estimate additional total loadings from these sources.

5. If it is infeasible or impossible to identify individual pollution sources with precision, best professional judgment should be used to identify the sources or categories of sources that are most likely to be responsible for the pollution, based on all available information about existing land use or management practices. Estimated pollution reduction allocations should be made based on such judgments. Although based on the best science and all available data, such estimates should be subject

to more detailed ambient monitoring to determine the effectiveness of pollution controls in reducing ambient pollution, along with verification of target attainment and elimination of use impairment.

Example: Same as above, but it is expected that additional nitrogen loadings derive from runoff from suburban lawns, parks, golf courses, etc. Based on the percentage of surface area characterized by such uses, and information on typical fertilizer application rates, etc., rough estimates can be made of total loadings from these sources.

STEP 4 — POLLUTION REDUCTION ALLOCATION

Proposed rigor hierarchy and associated proportionality requirements:

CAUTION: The following application of the hierarchy concept may not be entirely appropriate, because alternative approaches to pollution reduction allocations may reflect legitimate differences in regulatory philosophy. For example, one state might believe that it is most appropriate to favor older over newer sources in setting allocations; another might favor a purely pro rata approach based on equal pollution (or pollution reduction) percentages; while another might favor equalizing the total or incremental costs of pollution reduction among sources.

1. If data exist to identify the cost, technical feasibility, and other factors relevant to pollution reduction allocation decisions for all sources, such information should be used to make allocation decisions. If this information is known with relative certainty, it should be presumed that the resulting allocations will be effective, subject to verification of target attainment and elimination of use impairment.

Example: For the sewage treatment plants discussed above, the cost and efficacy of additional nitrogen controls is known with relative certainty, and can be used to determine potential incremental reductions from those sources.

2. If information on cost, technical feasibility and other factors relevant to pollution allocation decisions is known with less certainty, additional monitoring and assessment will be needed to verify the efficacy of the pollution reduction strategies chosen, as well as verification of target attainment and elimination of use impairment.

Example: With respect to the SSOs mentioned above, some information is available on the strategies chosen to reduce or eliminate SSO discharges, such as water conservation, rerouting of flows within the sewer system, etc. However, the effectiveness of the chosen controls cannot be known with certainty absent implementation and follow-up analysis, with additional measures added if necessary to correct remaining problems.

3. If information on cost, technical feasibility and other factors relevant to pollution allocation decisions is not known, such information should be collected and analyzed where it is

possible to do so expeditiously and effectively, and such information should be used as the basis for allocation decisions.

Example: With respect to the industrial sources mentioned above, additional engineering studies are needed to determine the costs and means available to reduce nitrogen discharges further from those sources.

4. If information on cost, technical feasibility and other factors relevant to pollution allocation decisions cannot be collected and analyzed expeditiously and effectively, allocation decisions should be made based on best professional judgment regarding the cost and technical feasibility of alternative pollution reduction strategies. More detailed follow-up monitoring and assessment will be needed to verify the efficacy of the pollution reduction strategies chosen, as well as verification of target attainment and elimination of use impairment.

Example: With respect to the row crop runoff discussed above, only general information is available on the effectiveness in reducing nitrogen loadings of best management practices such as soil testing, timing of fertilizer application, etc. While less precise than for point sources, such estimates can be used to establish initial load reduction allocations, subject to follow-up monitoring and evaluation.

5. If the cost and technical feasibility of pollution reduction strategies cannot be estimated based on best professional judgment, another (default) method must be chosen on which to base allocation decisions, such as equal percentage reduction by all sources, equal incremental reduction by all sources, etc. (technology-forcing). More detailed follow-up monitoring and assessment will be needed to verify whether the assigned pollution reductions are achieved, as well as verification of target attainment and elimination of use impairment.

Example: No technology is currently known to be available to reduce discharges of a toxic pollutant from three facilities in a particular industry (the only dischargers of the pollutant), but it is known that such reductions are necessary to meet the WQS and to eliminate use impairment. Load reduction allocations are made on a pro rata basis (such as 30 percent reduction per plant), with a specified (e.g., 3-year) compliance schedule in the revised NPDES permits. The dischargers must find ways to comply with the new permit limits through research and development in new pollution prevention or pollution control methods.

STEP 5 — IDENTIFICATION OF IMPLEMENTATION METHODS

Proposed rigor hierarchy and associated proportionality requirements:

1. For waters where impairment is limited to or dominated by point sources, and where specific numeric criteria are available and amenable to the calculation of WLAs that can be included in new or revised NPDES permits, implementation should be fairly straightforward, and should include: specific timetables and commitments to issue or revise the permits with fixed compliance schedules,

monitoring and enforcement commitment (including the nature and frequency of compliance monitoring, and who is responsible for such monitoring), ambient monitoring to determine whether achievement of the WLAs results in attainment of the WQS, and a feedback loop requiring revised WLAs, permits, etc., if the WLAs turn out to be inadequate. This should include specific milestones and benchmarks, including interim target deadlines as well as a final expected attainment date, against which the adequacy of the initial load allocation and implementation plan is measured, and that trigger appropriate revisions.

2. For waters where impairment includes significant or dominant nonpoint source contributions, implementation provisions will need to be more rigorous and iterative. Nonpoint source implementation provisions should include the identification of specific BMPs and other measures designed to achieve the necessary LAs, including identification of the specific practices that will be employed, by whom, where, and by when, and with what implementation or enforcement requirements and assurances (such as permits, contracts, cross-compliance requirements, plan approvals, etc.). This should include specific milestones and benchmarks including interim target deadlines as well as a final expected attainment date against which the adequacy of the initial load allocation and implementation plan is measured, and that trigger appropriate revisions. Additional monitoring and assessment will require ambient monitoring to determine the effect of the practices on water quality and related conditions; compliance assessment to determine the degree to which the selected practices are implemented; and to the extent possible, assessments of the efficacy and impacts of the practices chosen. Based on this monitoring and assessment program, the TMDL should include a specific timetable and process for evaluation of whether additional practices must be employed, by whom, where, and by when, in order to eliminate the remaining impairment. In choosing among implementation options, however, relatively more certainty about efficacy and need should be sought as the expected costs of implementation increase.

3. For waters where remedies involve restoration strategies to address “legacy pollutants,” habitat impairment (such as channelization or loss of riparian cover), water withdrawals, pollution “trading,” or other special issues, implementation provisions will need to be different than but similar to those suggested for nonpoint sources. For example:

a. For waters where it is believed that use impairment can be reduced or eliminated through habitat restoration projects, implementation provisions should include identification of the specific restoration projects that will be undertaken, by whom, where, and by when, and what implementation provisions are included to provide assurance that the projects will be completed (funding, assignment of responsibility, applicable enforcement and compliance provisions, etc.). Additional monitoring and assessment will require ambient monitoring to determine the effect of the restoration projects on water quality and related conditions; compliance assessment to determine the degree to which the selected projects are implemented; and to the extent possible, assessments of the efficacy and impacts of the projects chosen. Based on this monitoring and assessment program, the TMDL should include a specific timetable and process for evaluation of whether additional projects or practices must be employed, by whom, where, and by when, in order to eliminate the remaining impairment.

b. For waters where it is believed that use impairment can be reduced or eliminated through elimination or mitigation of legacy pollution, implementation provisions should include identification of the specific remediation projects that will be undertaken, by whom, where, and by when, and what

implementation provisions are included to provide assurance that the projects will be completed (funding, assignment of responsibility, applicable enforcement and compliance provisions, etc.).

c. For waters where it is believed that use impairment can be reduced or eliminated through practices to increase instream flows, implementation provisions should include identification of the specific water conservation, withdrawal timing, or other projects that will be undertaken, by whom, where, and by when, and what implementation provisions are included to provide assurance that the projects will be completed (funding, assignment of responsibility, applicable enforcement and compliance provisions, etc.).

d. For waters where it is believed that use impairment can be reduced or eliminated through pollution reduction trading, or where it is believed that the same result can be achieved at lower costs through trading, implementation provisions should include identification of the specific trading provisions and "rules" that will be employed, by whom, where, and by when, and what implementation provisions are included to provide assurance that the traded pollution reductions will be achieved, and for comparable forms of pollution with comparable impacts (funding, assignment of responsibility, enforcement and compliance provisions, etc.).

In all of these cases, additional monitoring and assessment will be required to determine the effect of the restoration, conservation, remediation, trading or similar projects on water quality and related conditions; compliance assessment to determine the degree to which the selected projects are implemented; and to the extent possible, assessments of the efficacy and impacts of the projects chosen. This should include specific milestones and benchmarks, including interim target deadlines as well as a final expected attainment date, against which the adequacy of the initial load allocation and implementation plan is measured, and that trigger appropriate revisions. Based on this monitoring and assessment program, the TMDL should include a specific timetable and process for evaluation of whether additional projects or practices must be employed, by whom, where, and by when, in order to eliminate the remaining impairment.

STEP 6 — MONITORING AND ASSESSMENT OF EFFECTIVENESS

The degree of follow-up monitoring and assessment depends on the relative degree of rigor and precision obtained in Steps 1 - 5. To avoid duplication, the specific weaknesses in earlier steps that trigger heightened monitoring and assessment requirements will not be repeated here.

STEP 7 — TMDL REVISION (IF NECESSARY)

Same as Step 6, but with respect to the requisite need for TMDL revisions if follow-up monitoring and assessment indicates that the initial application of Steps 1 - 5 was not adequate to attain the target and to eliminate use impairment.

Appendix G: Outline of the Hierarchy Approach to TMDL Approval (With Examples)

SUFFICIENCY OF APPROVAL PROCEDURES

The following section describes how the Hierarchy Approach—in particular, the concept of inverse proportionality—can apply to procedures under which EPA reviews individual TMDLs. It should be noted that this section forms the basis of several of the recommendations included in Section 8.1 of the report (on EPA oversight).

Proposed rigor hierarchy and associated proportionality requirements

1. EPA defines specific procedures for preparation of TMDLs. If the State adopts those criteria and agrees to apply them, EPA should approve the procedures initially to ensure that they comply with the EPA guidelines. Then, EPA oversight over individual TMDLs can be less rigorous. Increased opportunities for public participation and stakeholder involvement, if they reflect the full range of affected interests, also may suggest less detailed EPA oversight.

2. The State might adopt the specific EPA procedures and apply them to most TMDLs, which will receive less EPA oversight. However, the State might deviate from those procedures for complex TMDLs or other TMDLs that require different treatment. Such cases will be targeted for increased EPA review.

3. If the State adopts standard procedures that differ from those proposed by EPA, to account for legitimate differences in ecology, hydrology, pollution sources, etc., EPA will conduct more rigorous review of the initial procedures. Once these procedures are approved, increased EPA review of individual TMDLs will be needed initially to confirm that they are appropriate. Thereafter, the same approval procedures as identified in 1 and 2 will be appropriate.

4. If the State adopts standard procedures for the preparation of certain categories of TMDLs within the State (for example, TMDLs involving predominantly nonpoint source pollution from similar patterns of row crops in very similar watersheds), EPA will conduct more rigorous review of the initial procedures. Once these procedures are approved, increased EPA review of individual TMDLs will be needed initially to confirm that they are appropriate. Thereafter, the same approval procedures as identified in 1 and 2 will be appropriate.

5. If the State adopts a case-by-case approach to TMDL development rather than adopting standard procedures, detailed individual review of TMDLs will be required.

6. The State undertakes significant efforts, such as increased data gathering efforts or comprehensive implementation programs, to reduce the level of uncertainty as to whether a TMDL will lead to WQS attainment. Relatively less detailed EPA review is appropriate in such cases.

7. If the State believes that existing programs or requirements are adequate to attain the goals of the TMDL program, such program will be presumed adequate if the State shows that the existing program or set of requirements is comparable in all respects to the requirements of the TMDL program (complete functional equivalence), including all of the rules and procedures set forth above, as applied to the individual water body. In other words, rather than preparing a new "program" to meet the TMDL

requirement, the State will formally submit the existing program and accompanying requirements as the TMDL for the subject water body, subject to EPA review and approval. This does not, however, imply automatic approval of TMDLs developed pursuant to these equivalent procedures or programs. Rather, each such TMDL will be subject to the same rules of submission and approval as other TMDLs.

Appendix H: Discussion Paper on Legal Authority for TMDL Implementation Plans

To assist in its deliberations, the Committee established a special subgroup to review the options for requiring implementation plans. During the subgroup's review efforts in mid-1997, Bob Perciasepe, Assistant Administrator for Water at EPA, issued a policy memorandum addressing TMDL pace and implementation questions and suggesting that implementation would be provided for under §303(e). However, EPA has made it clear that this is an interim policy that may be revised based on recommendations from the TMDL FACA Committee.

The Committee has agreed to recommend that implementation plans be developed as part of the TMDL process and has agreed upon certain elements that need to be in the plan, including the State's plan for taking regulatory and non-regulatory action to carry out the TMDL, a description of the ramifications of failure of the plan to attain water quality standards, and provisions for modification of the TMDL should it fail.

AREAS OF AGREEMENT

The Committee's recommendations reflect several important areas of agreement on how best to require implementation planning. These include the following points:

1. Implementation plans should be required as part of the TMDL process and should be completed and submitted to EPA at the time a TMDL is completed/submitted. Such a requirement will promote reasonably expeditious implementation and help avoid the problem of the TMDL becoming outdated or "stale" before implementation is undertaken.

2. States should be held accountable for developing implementation plans through incentives (or applicable sanctions, if necessary) to help ensure that implementation gets high priority and that water quality problems are addressed.

3. Accountability mechanisms available under §303(d) would include:
   - recognizing a TMDL as "complete," and therefore approvable by EPA, only when the implementation plan is complete, and
   - possible citizen suit enforcement of the requirement to develop TMDLs, including the implementation plan.

4. Accountability mechanisms available under §303(e) could include a variety of oversight and leadership tools through which EPA generally influences State action.

5. If EPA should decide to rely on §303(e) to require implementation planning, EPA would need to substantially revitalize the §303(e) Continuing Planning Process (CPP) and may need to revise the regulations implementing that provision to include a specific requirement for TMDL implementation planning.

6. If EPA itself is responsible for completing the TMDL, the Agency should seek ways to develop the implementation plan cooperatively with affected States and localities so that needed actions can be identified at all levels of government. It would be expected, however, that implementation plans developed by EPA would rely more heavily on federal actions to achieve water quality goals.

UNRESOLVED ISSUE

In its discussion of implementation plans, the subgroup considered whether States should submit implementation plans prepared for a TMDL as part of the TMDL itself (under CWA §303(d)), or, consistent with EPA's interim policy, as part of the State's CPP (under CWA §303(e)). The subgroup and, subsequently, the Committee did not reach consensus on this point. While there was agreement that §303 provides sufficient authority to require TMDL implementation plans, some members felt strongly that §303(d) can be read to require submittal of implementation plans as part of the TMDL and expressed strong preference for this approach, while others felt strongly that only the §303(e) CPP is legally available.

Perceived advantages associated with requiring implementation plans under §303(d) were that this approach would be more simple and administratively straightforward, and, most importantly, would make actual implementation more likely. Some members, however, had some concerns that reliance on §303(d) could lead to judicial enforcement of TMDL implementation plans in unexpected or unintended ways (e.g., by requiring States or EPA to establish new regulatory authorities for implementation).

On the other hand, perceived advantages associated with requiring implementation plans under §303(e) were that it might impose a lesser burden on EPA in reviewing individual TMDLs, and that implementation planning, in the view of some members, is best handled as part of the State's broader water quality management efforts, which are to be described under §303(e). Members who favored reliance on §303(d), however, were concerned that reliance on §303(e) would require significant revitalization of the Continuing Planning Process—a controversial and resource-intensive undertaking—and, even if this were done, the resulting process for managing implementation planning would be difficult, cumbersome, and time-consuming.

An important difference between requiring implementation planning under §303(d) and §303(e) is that requiring implementation plans under §303(d) would subject the plans to EPA review and approval along with the TMDL, at the same time the TMDL is submitted. The extent and timing of EPA review of TMDL implementation plans submitted under § 303(e) is less clear (as indicated above, implementing regulations under §303(e) would need to be revised to make this more clear). Members who favored reliance on §303(d) were concerned that §303(e)'s lack of specific EPA review and approval requirements for individual TMDL implementation plans may make their establishment appear to be less important, and their actual implementation less likely.

In addition, because EPA is statutorily required to complete TMDLs in the event a State fails to do so, requiring implementation plans under §303(d) could ultimately subject EPA to a requirement to complete a State's TMDL implementation plan. Clearly, EPA could develop implementation plans, but it may not

have the authority a State would have to carry out the plan and, because of this, some members were concerned that at least in some cases plans established by EPA could become simply paper exercises. Others noted that even if EPA could not fully implement the plan, having an EPA plan would be better than having no plan at all. Members noted, however, that EPA could and should work to enlist the proper State and local agencies to support and implement the plan in these cases. It was noted, however, that it may be difficult to enlist State support in implementation if the State failed to complete an approvable TMDL in the first instance.

It is unclear whether, under §303(e), EPA would have responsibility for establishing plans in the event a State fails to do so. Some members saw this as a potential advantage, since if §303(e) does not require EPA to step in if States fail to act, EPA would not need to establish plans it might not be able to implement. Others were concerned that without federal back-up, States might not complete adequate implementation plans or do so promptly.

Appendix I: Minority Reports

This Appendix contains minority reports prepared by Committee members who voted against specific report language adopted by the Committee under its Groundrules by a vote of 18 or more members (see Committee Groundrules, Appendix C).

MINORITY REPORT
Melissa Samet
6/8/98
EPA TMDL FACA

The FACA voted to recommend that "EPA, by regulation, direct States to set expeditious timeframes, of not more than 8-15 years, for States to complete their TMDL development."

I disagree with the portion of this recommendation that would allow States to have 8 to 15 years to complete their TMDLs. It is critical that States prepare all their TMDLs as expeditiously as possible. However, the timeframe recommended by the Committee does not accomplish this. Instead, States should be required to complete all of their TMDLs within 5 to 6 years (this time period should be shorter if EPA does not adopt the Committee's recommendation to require implementation plans to be submitted with each TMDL).

The Clean Water Act established a national goal of eliminating the discharge of pollutants into the navigable waters by 1985. Clean Water Act § 101(a)(1), 33 U.S.C. § 1251(a)(1). TMDL development was to have begun by 1973. Clean Water Act § 304(a)(2), 33 U.S.C § 1314(a)(2). Thus, it was the intent of Congress that all TMDLs would be developed and implemented, and water quality standards attained within 12 years. It is now 25 years after the TMDL process was to have begun, and 13 years after the goal of clean water was to have been met, and innumerable TMDLs still have not even been started. Even more importantly, no waters have attained water quality standards as a result of the Clean Water Act's TMDL requirements.

This delay is unconscionable. And, it has resulted in very real impacts. For example, children in the Great Lakes and elsewhere are suffering from developmental impairments and a host of other health problems; we all have been exposed to known and potent carcinogens; salmon and fish eating birds, including our national bird, the bald eagle, have plummeted to the brink of extinction; fish eating species such as mink and alligators are suffering from reproductive failure, impaired sexual development, and immune system deficiencies; and in the Gulf of Mexico, there is a yearly die-off of all marine life that cannot escape a zone of hypoxic waters -- waters so devoid of oxygen due to nutrient overenrichment from the Mississippi River that marine life cannot survive -- that is larger than the States of Connecticut and Rhode Island combined.

There is no justification for allowing this assault to continue. To the contrary, the Clean Water Act, national policy, and our ethical obligations, require that the nation's waters be cleaned up as quickly as possible. TMDL development is a critical step in this process, but it is just a first step.

Once developed, TMDLs still must be fully implemented and water quality standards attained before our waters will be clean and safe. Thus, the TMDL development phase should be completed as expeditiously as possible. In no event should this phase take as long as the 8 to 15 years recommended by the Committee.

MINORITY REPORT
Rob Olszewski
6/2/98
EPA TMDL FACA

The TMDL FACA discussed the process around setting 'baselines" of pollutant loadings for impaired waters in relation to a number of different subtopics. During the specific discussions regarding stabilization plans, I expressed a dissenting vote in order to express the concern that application of "baseline" loads related to forestry operations present some unique challenges that should be acknowledged in the process. This same objection could have been expressed in a number of different elements of the FACA's discussion, but I chose to only state this position once in order to be able to articulate this particular concern in a minority report.

Forestry operations are unique because of the fact that this particular land use does not require annual "treatments" or specific activities to occur on given sites on a yearly basis. In addition to this fact, the timberlands within any given impaired watershed are not typically divided equally in terms of acreage by specific age classes. Many impaired watersheds may also have hundreds of individual small, private nonindustrial forest landowners with varied objectives. Market conditions also can change significantly from year to year, with high demand driving more of these individual landowner's decisions to sell timber in one year compared to another. As a result of these and other factors, the number of specific silvicultural activities occurring in a given impaired watershed may vary significantly in any given year.

Because of these unique circumstances, states should not set baseline allocations related to forestry operations based on the input from any given specific year. Some type of rolling year-over-year average should be used related to the impacts associated with this land use. Otherwise, baseline allocations where silvicultural operations represent a potential impact could be set at levels too low if only a few activities occurred in a "baseline" year, or conversely, too high if a larger than typical number of activities occurred in a given year.

Obviously, weather-related events are also a key factor in driving variability among silvicultural nonpoint sources but this particular minority opinion is targeted at the concern with the operational variability and timing of forestry as a unique land use, and the need to recognize this fact when developing baselines, allocations, and implementation strategies associated with the TMDL Process.

TOTAL MAXIMUM DAILY LOADS — MINORITY REPORT

submitted by

The Honorable William D. Nielsen
City Council President
Eau Claire, Wisconsin, National League of Cities
TMDL FACA Subcommittee Member

and

J. Brad Burke
TMDL FACA Subcommittee Member

This joint minority report to the TMDL FACA Subcommittee Report (Subcommittee Report) is being submitted by TMDL FACA Subcommittee members William D. Nielsen and J. Brad Burke. In this minority report, Mr. Nielsen and Mr. Burke oppose the Subcommittee Report on two major issues:

- the assignment of pollutant reductions based on "enforceability," which legitimizes environmental inequity and imposes a disproportionate burden on point sources; and,

- the issues raised with respect to cities and dams in Section 6.1, "Extremely Difficult Problems ...," which is totally inappropriate and fails to account for the fact the neither dams nor cities are exclusively or necessarily linked to water quality impairments.

ENFORCEABILITY AS ALLOCATION CRITERION

Incorporating "enforceability" as a criterion for allocating pollutant reductions is inherently inequitable and has significant ramifications for concerns about environmental justice, as described below.

Since "enforceability," in terms of federal authority, is applicable only to point sources, inclusion of this concept in determining allocations will result in point sources bearing more than their fair share of responsibility for attainment of designated uses in the nation's waterbodies, a result completely unacceptable to the municipal community. It is inequitable to require municipal residents, whatever their economic circumstances, to bear these additional costs (through either tax or rate increases or diversion of local resources from other services) of stream restoration regardless of the sources of degradation. Municipalities will accept full responsibility for the pollutants attributable to municipal or municipally-located sources (i.e., sources over which we have authority and/or control); municipalities cannot and will not accept responsibility for the loadings of those outside their political boundaries. (See also Chapter 6., **Impairments Due To . . .**, Section 6.1, Extremely Difficult . . ., *Recommendation* 3. which again singles out point sources for more rigorous requirements in determining "short-term allocations for permit limits." While some attempt was made in the following *Recommendation* 4. to

mitigate the impact on point sources, with the deletion of *"regulatory or economic"* as modifiers, it is now sufficiently vague as to be meaningless.)

In addition, allocations based on "enforceability" will result in severe restrictions, if not outright moratoria, on growth and/or revitalization in urbanized areas. While the *Report* suggests "growth" *may* (not mandatory) be a consideration in the allocation process, overall the document is clearly hostile to development and re-development (see, e.g., Chapter 3, **Identifying Impaired Waters**, Section 3.5, Source Constraints, *Problem Statement, Point Sources*, with respect to "zero discharge" as well as subsequent discussion on "restrictions on new or additional discharges"). Cities can neither accept nor support a federal "no-growth" policy developed by a federal advisory committee. Such a policy has broad ramifications beyond controlling pollution of the nation's waterways. Allocations based on enforceability establish a *de facto* "no-growth" policy placing untenable burdens on point sources while leaving others free to continue their activities unencumbered by any constraints. This presents an equity question of major proportions that is not appropriately addressed by the TMDL FACA.

Like municipalities, industry will also be forced to bear more than its fair share of responsibility for attainment of designated uses. Through its compliance with effluent guidelines regulations, industry has already contributed substantially to the cause of clean water. It is patently unfair to encourage states to impose further burdens on point sources merely because of the absence of federal enforcement authority over nonpoint sources.

The modifications adopted by the FACA at the May meeting with respect to "Section 5.5 The Allocation Process, 1.," (Chapter 5, **TMDL Development**) are subject to a variety of interpretations potentially inimical to the interests of cities and industry, and are inadequate to resolve the concerns raised above.

We are disappointed, given the recent policy pronouncements from both Vice President Gore (the Clean Water Action Plan) and EPA ("Picking Up the Pace"), that a stronger statement with respect to load allocations reflective of actual sources of pollution, was not advocated by the Agency or incorporated in the Subcommittee Report.

EXTREMELY DIFFICULT TO SOLVE PROBLEMS

The revised Section 6.1, **Impairments Due to Extremely Difficult to Solve Problems**, also presents significant concerns. First, there was little, if any, input by municipal representatives in the development of this section.

Second, we cannot agree that the very existence of cities is a "problem" – special or otherwise. Growth and development do not *per se* translate into deteriorating water quality. Given our advanced level of technology – growth AND water quality can coexist. In many respects, protection of water quality is more likely to be facilitated by encouraging people to live in cities rather than developing and populating green space.

Third, we also do not concur on the issue of including municipally-owned/operated facilities in this section of the *Report*. We know of no one – not EPA, not the environmental activists, not city employees operating the Phase I stormwater permit program – who is able to suggest how urban stormwater runoff can be addressed to meet water quality standards. Since the recently proposed Phase II regulations tie the urban stormwater permit program to the TMDL program, we also believe this provision totally eliminates any advantages cities may have been granted by the *August 1996 Interim Permitting Approach for Water Quality-Based Effluent Limitations on Storm Water Permits* (which essentially acknowledged that numerical effluent limits for stormwater runoff are infeasible and hence, inappropriate at this time). Furthermore, unless EPA is proposing massive expenditures of non-existent local resources for significant expansion of POTWs and related facilities, it is unlikely that municipalities can entirely

eliminate CSOs or SSOs. We simply cannot agree to a policy that requires municipalities to achieve the impossible with attendant penalties for failure to do so.

Fourth, with respect to "flows," local elected officials firmly maintain that land use planning is an activity solely within the purview of local government. There is neither precedent nor authority for federal pre-emption of this most significant local government function. We vehemently object to and oppose any proposal granting EPA control – directly or indirectly – over land use planning within a municipality. (See, e.g., Chapter 5, **TMDL Development**, Section 5.4, Criteria for Approval, *Recommendations*, 1. d. See also, Chapter 6, **Impairments Due to Extremely Difficult to Solve Problems**, Section 6.3 Modification to Flow, and Chapter 8, **EPA's Role**, Section 8.2, Assessing State Program Effectiveness, *Recommendation* 1. calling for enhanced EPA oversight [intrusion?] when addressing complex TMDLs.) As the nation's body of knowledge of water quality impacts has expanded and been more widely disseminated, local elected officials increasingly recognize the impact of altered flow patterns on receiving waters and account for these in locally developed land use plans and zoning decisions.

Fifth, we oppose the inclusion of "large existing dams" within the first category of "difficult historic problems" (Section 6.1 Discussion). Congress never intended that the TMDL program address in any way water quality impairments attributed to dams. That is evident from the language of §303(d)(1)(c), which requires development of TMDLs for "pollutants," not "pollution." Therefore, it is wholly inappropriate for the Subcommittee to recommend §303(d)(1) listing of waters impaired by dams, and to recommend "reasonable reductions" to the allocations of existing sources based on relative conditions to impairments by dams. Furthermore, it is impractical to require listing of waters impaired by dams because the majority of dams are permanent structures that typically provide significant societal benefits, such as supplying drinking water and/or energy. Also, flow modifications caused by dams are already subject to extensive regulation by federal authorities (e.g., the Federal Energy Regulatory Commission [FERC]), and extension of the TMDL program to waters impaired by dams will only create a confusing regulatory overlap. Water quality is already a significant consideration in FERC decisions.

Sixth, we specifically oppose *Recommendation* 4, which proposes "reasonable reductions" of the allocations of existing sources "in light of the relative contribution of special challenge sources" such as contributions to impairments caused by dams. The Subcommittee makes this recommendation despite its acknowledgment that the contribution of the existing sources "may be minor in relation to the special challenge source." This is patently unfair. Many impairments caused by what the Subcommittee refers to as "special challenge sources" developed over a long period of time. It is inappropriate to penalize current dischargers for such "special challenge" sources, particularly when reductions in their allocations will not significantly quicken attainment of water quality standards.

Pollutant allocations for current dischargers should not be affected by the perceived need to address "special challenge sources" unless reasonable reductions by the current dischargers would be expected to significantly improve water quality for the pollutant of concern within the next five-year NPDES permit cycle.