

Public Interest Comment
on the Environmental Protection Agency's
Proposed Changes to the Total Maximum Daily Load (TMDL) Program and
to the National Pollution Discharge Elimination System (NPDES) and Water
Quality Standards (WQS) Regulations¹

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of regulations and their impacts on society. As part of its mission, RSP produces careful and independent analyses of agency rulemaking proposals from the perspective of the public interest. Thus, the program's comments on the Environmental Protection Agency's (EPA's) proposed changes to its Total Maximum Daily Load (TMDL) program and to the National Pollution Discharge Elimination System (NPDES) and Water Quality Standards (WQS) regulations do not represent the views of any particular affected party or special interest group, but are designed to protect the interests of American citizens.

These comments first review the history of federal and state regulation of water quality and highlight the delicate balance of authority that has emerged between these government levels. Section II then provides a summary of the two proposed water quality regulations on which EPA requests comment. Section III examines the implications of the proposed changes on the federal-state relationship and water quality, and analyzes the net benefits to the American people. Section IV offers alternatives to EPA's approach, emphasizing common law and property rights solutions to continuing water quality problems. The final section offers recommendations for improving EPA's proposals.

I. Water Quality Regulations Under the Clean Water Act Have a Complex History

Congress passed the Clean Water Act (CWA) in 1972.² The CWA's goal was to enhance and protect the quality of the nation's waters while respecting the authority of each state to regulate the use of its waters.³ Even before the Clean Water Act, however, states were required to designate water bodies as suitable for recreation, propagation of aquatic life or other specific classifications, including public water supplies, agriculture, and industrial uses. The Water Quality Act of 1965 directed states to develop water quality standards that set water quality goals for interstate waters.

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² 33 USCA Chapter 26 Sec. 1313.

³ 33 USCA Chapter 26 Sec. 1251 (a) states the objective of the act to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Sec. 1251 (b) further declares: "It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator in the exercise of his authority under this chapter."

The Clean Water Act broadened state requirements for establishing water quality standards, or WQS, and directed EPA to develop and publish, in “consultation with appropriate Federal and State agencies and other interested persons, . . . criteria for water quality accurately reflecting the latest scientific knowledge

- (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water;
- (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and
- (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.”⁴

Based on these numerical “criteria,” states are required to develop water quality standards that apply to interstate waters and submit them to the Administrator of the EPA.⁵ According to the proposed rule, “water quality standards are the State’s goals for individual waterbodies and provide the legal basis for control decisions under the Act.”⁶ The Administrator reviews states WQS to ensure that they are not inconsistent with the requirements set by the statute. If states fail to submit proper standards, the Administrator may impose WQS.

These WQS constitute a major portion of the nation’s water pollution control system. They have been implemented largely through the National Pollutant Discharge Elimination System (NPDES) program, which restricts the entry of pollutants into state waters by requiring point-source polluters to obtain permits from the states. The permits specify what and how much of what pollutants may be emitted from sewage treatment plants, factories, and other pollution sources into specific bodies of water. The effluent allowed under these NPDES permit is based on application of the “best technology” for a given effluent. Over 350,000 permits have been issued and the number is growing rapidly.

The Clean Water Act also requires states to identify water bodies in which the technology-based point-source effluent limitations set by the NPDES program are not sufficient to achieve water quality standards. States must establish a priority ranking, which considers the severity of the pollution and the designated use of the water. Section 1313 (d) (1) (C) requires each state to establish,

in accordance with the priority ranking, the total maximum daily load [for pollutants the EPA has identified as suitable for calculations]. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a

⁴ 33 USCA Chapter 26 1314 (a)1.

⁵ States are to review their water quality standards once each three-year period.

⁶ Proposed Section 130.0(b) (64 FR 46045).

margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

To date, such total maximum daily loads or TMDLs, have played a rather small role in the nation's clean water policy. The proposed rule would increase that role, and redefine TMDL as

written plans and analyses established to ensure that the waterbody will attain and maintain water quality standards (as defined in 40 CFR 131) including consideration of reasonably foreseeable increases in pollutant loads.⁷

EPA's fact sheet defines a TMDL as a "framework for restoring polluted waters." The framework comprises the following two steps:

- A calculation of the maximum amount of a pollutant that a waterbody can take in and still meet water quality standards; and,
- A distribution of that amount to the pollutant's sources.⁸

Congress clearly intended for the NPDES to reflect a "command-and-control" approach to limiting the discharge of effluent in waters. What has never been clear, and has generated substantial litigation over the years, however, is the limit of EPA control over state permit programs. Since the Clean Water Act gives the states the primary responsibility for water quality programs, what are the limits on EPA rejection of state plans? A large body of regulatory law has arisen around the permit process; and the EPA and the states have engaged in numerous informal and formal tussles over the years. Since neither Congress nor the Supreme Court have clarified the position of the EPA with respect to the states in this process, the two parties have learned to live with the uncertainty and move forward with the business of limiting water pollution. As of 1996, 40 states had been authorized by EPA to issue NPDES permits. In the other 10 states, the EPA issues the permits.⁹ As explained below, the Proposed Rules, which place new emphasis on EPA approval of state plans, or TMDLs, is likely to alter this delicate balance, moving the primary permitting responsibility from the state to the federal level

II. EPA's Proposals

On August 23, 1999, EPA published two notices in the *Federal Register*. The first would revise the Water Quality Planning and Management or TMDL regulations, and the other would revise the NPDES and Water Quality Standards to facilitate implementation of the new TMDL rule. This section briefly highlights the key aspects of each proposal.

⁷ Proposed Section 130.2(h) (64 FR 46046).

⁸ "What is a TMDL?," www.epa.gov/owow/tmdl/cleanfs1/html

⁹ See GAO/RCED 96-42.

A. Proposed Revisions to the TMDL Regulations

EPA states that the purpose of the proposed revisions to the TMDL regulations is “to provide states with clear, consistent, and balanced direction for listing waters and developing TMDLs, resulting in restoration of waterbodies not meeting water quality standards.”¹⁰

The proposal details the methodologies states must use when determining which water bodies to list as not meeting current water quality standards. Each state would be required to articulate such methodologies according to the proposed rule specifications, elicit public comment on the methodology, and submit the methodology to EPA for review eight months before it submits its actual list to EPA for approval.

State lists would have to place the water bodies identified as not meeting water quality standards into one of four categories:

1. Part 1 waters are impaired or threatened by pollutants or by unknown causes;
2. Part 2 waters are impaired or threatened by pollution,
3. Part 3 waters are those for which TMDLs have been completed, but water quality standards have not yet been attained; and,
4. Part 4 waters are expected to meet water quality standards by the next listing cycle as a result of the use of other enforceable pollution controls.

“Pollution” is defined in these regulations and in the Clean Water Act as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.”¹¹ “Pollutants” include residues; industrial, agricultural or municipal wastes; heat; biological materials; radioactive materials; solid wastes; discarded equipment; rock sand or cellar dirt; as well as contaminants regulated by the Safe Drinking Water Act.¹² The rule would require states to establish TMDLs in the first category – waters that are impaired or threatened by pollutants or by unknown causes. Once identified as impaired, waters would remain listed until water quality standards are achieved.

The TMDLs themselves work much like State Implementation Plans (SIPs) in EPA’s air program. States establish the maximum amount of each pollutant a water body can receive while still attaining water quality standards and determine the allowable contributions of each pollutant from each contributing source in a watershed. The TMDL specifies the maximum daily loads of each pollutant and the required reductions from discharging sources necessary to meet WQS. States submit these plans (TMDLs) to EPA for approval.

¹⁰ www.epa.gov/owow/tmdl/tmdlsfs.html

¹¹ Proposed Section 130.2(c) (64 FR 46046).

¹² Proposed Section 130.2(d) (64 FR 46046).

Until now, TMDLs have not played a major role in EPA's water quality management strategy. Although this is the case, the proposal specifies more detailed requirements for TMDL preparation and submission.

First, the new regulation – if promulgated – would require states to commit to schedules for establishing TMDLs. Such schedules would have to be submitted to EPA and would have to establish a timeframe of no longer than 15 years for addressing all water body and pollutant combinations in the state. The proposal requires states to establish TMDLs for high priority water bodies before medium and low priority water bodies, and also prescribes characteristics (such as threats to endangered species) that would dictate a “high priority” designation. Schedules should call for the establishment of TMDLs for high priority water bodies no later than five years from listing. The proposal would also allow the public to petition EPA to step in and establish TMDLs in a state if the state fails to do so on schedule.

While EPA requires states to submit for EPA review their methodology for listing impaired waterbodies and schedule for establishing TMDLs, it will not approve or disapprove the methodology or schedule. Instead, the proposed rule states that EPA will comment on states methodologies and schedules, and consider them “in its review and approval or disapproval of [state] list and priority rankings.”¹³

The proposal also identifies the following ten specific elements each TMDL must include before it can be approved by EPA:

1. Name and location of the impaired or threatened water body as well as upstream waterbodies that may contribute to impairment;
2. Identification of the pollutant and the amount of the pollutant that the water body can receive and still meet water quality standards;
3. Identification of the amount by which the pollutant must be reduced for the water body to meet water quality standards;
4. Identification of the source or sources of the pollutant;
5. Determination of the amount of the pollutant that may come from point sources;
6. Determination of the amount of the pollutant that may come from nonpoint sources;
7. A margin of safety;
8. Consideration of seasonal variations;
9. Limited allowance for future growth and reasonably foreseeable increases in pollutant loads; and,

¹³ Proposed Section 130.24(c) (64 FR 46048) and 130.31(c) (64 FR 46050).

10. An implementation plan.

The implementation plan is a new requirement. For EPA to approve the TMDL, this implementation plan must include these eight elements:

1. A list of actions needed to reduce pollutant loadings and a demonstration that these actions are expected to achieve required pollutant loads;
2. A detailed timeline describing when these actions will occur;
3. Reasonable assurances that the waste-load allocations for point sources and the load allocations for nonpoint sources will be implemented;
4. Legal authorities to be used;
5. Estimate of the time it will take to meet water quality standards, and the basis for that estimate;
6. Monitoring or modeling plan to determine if reductions are being achieved;
7. Milestones for measuring progress; and
8. Plans for revising the TMDL if progress is not being made.

The proposal also emphasizes public participation and opportunity to comment on lists, priority rankings, schedules, and TMDLs prior to submission to EPA.

B. Proposed Revisions to the NPDES and Water Quality Standards Regulations

EPA states that the purpose of the proposed revisions to the NPDES and water quality standards regulations is “to achieve reasonable further progress toward attainment of water quality standards in impaired waterbodies after listing and pending TMDL establishment, and to provide reasonable assurance that TMDLs, once completed, will be adequately implemented.”¹⁴

Existing NPDES regulations allow states to grant a new or expanding facility the permits necessary to discharge pollutants into a water body as long as the facility obtains “offsets,” or discharge reductions, from existing sources (as necessary to attain or progress toward meeting water quality standards). The proposed revisions would restrict the use of offsets by requiring large new or significantly expanding dischargers¹⁵ to obtain an offset of 1.5 times their proposed discharge (1.5:1) before beginning to discharge, unless the state determines that an offset of less than 1.5:1 but more than 1:1 is sufficient to attain water quality standards. States may also determine that no offset should be allowed, if any such offset would degrade water quality.

¹⁴ www.epa.gov/owow/tmdl/tmdlfs.html

¹⁵ A significant expansion would be defined as a 20 percent or greater increase in pollutant loadings above current permitted pollutant loads.

The proposal would also give EPA more authority over the granting of NPDES permits. For discharges to impaired water bodies in NPDES-authorized states, EPA would have the authority to object to, and ultimately reissue, expired and administratively-continued permits if necessary to ensure progress toward meeting water quality standards and implementing TMDLs. Under the proposal, EPA would also have the authority to designate certain operations, such as Concentrated Animal Feeding Operations; Concentrated Aquatic Animal Production Facilities; and certain silviculture operations as point sources and require them to obtain NPDES permits after completion of a TMDL in cases where EPA is required to establish the TMDL.

III. Implications of the Proposed Rules

Total Maximum Daily Loads, an important concept in assuring water quality, have not previously played a major role in water quality regulations, which have focused more on NPDES controls on point sources. The Proposed Rules would place TMDLs, which the states are ordered to produce within one year, at the cornerstone of federal water controls.

This shift in focus from NPDES and point source controls to TMDLs reflects the fact that most point sources are highly regulated and that discharges that enter water from point sources are minimal due to existing regulation. While there are problems with some public sewage treatment plants, it is generally accepted that for there to be significant improvements in water quality around the nation, it makes little sense to tighten the standards for point sources even further. Further tightening would add substantial costs while providing little improvement in water quality.

Nonpoint sources, including agriculture, silviculture, and urban run-off, are a major sources of most water pollution. Thus, a focus on reducing effluent from nonpoint sources is likely to be more cost-effective than further restrictions on point sources. Since nonpoint sources are, by definition, hard to pinpoint – no pipe emits treated water into a body of water, but rather sediment from multiple sources flows in along the banks of countless waterways – it makes little sense to talk about technological controls on nonpoint sources. The focus should be on what ends up in water that causes harm. In this sense, the basic thrust of the Proposed Rule is logical. The focus should be on what is in a particular body of water that may harm humans or aquatic life, not the specifics of exactly how much is contributed from every single source into every single body of water.

The essential problem with the Proposed Rule, however, is that it grants the federal EPA nearly unlimited authority to address anything that affects any body of water under a multitude of standards and considerations that EPA may apply on a case-by-case basis. This sweeping federal authority is particularly inappropriate considering the lack of knowledge of the extent of the problem the rule proposes to address, and the very local nature of water quality issues.

EPA is right, both economically and ecologically, to focus on watershed management of water quality. However, water quality is largely a local issue, as every water basin differs in its science and uses. EPA should be concerned with water quality – what is in the water that causes harm – but it should not be concerned with the details, at the federal level, of pollution control efforts for each and every body of water nationwide. Not only is this a virtually impossible task, but it conflicts with the intent of Congress when it mandated that each state have authority over its own waterways.

This section raises four general concerns with EPA’s proposal as drafted:

- A. It does not respect the local nature of water bodies and conflicts with the goal of Congress that states should retain primary responsibility for water quality control;
- B. Its requirements are not supported by sound science;
- C. It is both prescriptive, and open-ended, leaving states little flexibility, but burdening them with substantial responsibility; and
- D. It fails to consider how significant the costs will likely be.

A. Highly Specific National Controls Do Not Respect the Local Nature of Water Bodies and Conflict with the Goal of Congress

The prescriptive nature of the proposed TMDL rule conflicts with the objective of Congress in the Clean Water Act, to give states primary responsibility for water quality control. As noted in the CWA: “It is the policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution....” The states are “to consult” with the Administrator of the EPA, as Congress supports federal research and “technical services and financial aid to State and interstate agencies and municipalities in connection with the prevention, reduction, and elimination of pollution” (at 33 USCA § 1251(b)). Furthermore, the Clean Water Act states “It is the policy of Congress that the authority of each state to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter. It is the further policy of Congress that nothing in this chapter shall be construed to supersede or abrogate rights to quantities of water that have been established by any State. Federal agencies shall cooperate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution with programs for managing water resources” (at 33 USCA § 1251(g)).

Congress apparently recognized the inherently local nature of waterbodies. The water quality goals, standards and procedural approaches that make sense in one area may not be appropriate in another. EPA recognizes this to some extent by refocusing on a watershed rather than technology-based approach to water quality management. Yet, EPA’s proposals, rather than allowing states to make decisions regarding local water bodies based on their own unique characteristics, would define procedures and controls, and could impose federal authority and priorities on states.

The emphasis in the proposal is on national consistency and uniformity, when in fact local approaches tailored to individual water bodies and the preferences of the populations living near those water bodies are much more likely to be effective.

The proposal authorizes EPA to determine TMDLs for all “Part 1” waters in the nation, either through conditions it imposes for approval of state plans or by taking over a state program. In addition to asserting authority in these rules to require any WQS for any water body, EPA leaves open the possibility that in the future it might to, “in the future, “promulgate federal water quality

standards for states, pursuant to section 303(c)(2)(B), to ensure consistent, nationwide application of the new requirements in the period between listing and TMDL establishment.”¹⁶ Thus, states must submit water quality plans that meet EPA approval, for achieving standards that may be determined by EPA at a later date on a case-by-case basis.

States, in establishing TMDLs to meet water quality standards for a given water body, must include every possible source that might contribute to loadings of any pollutant. That is, the impact on water from all possible sources must be determined by the states for every body of water impaired or threatened by pollutants or unknown sources, including: point sources of pollutants (discharges from public and private sources such as water treatment plants); nonpoint sources of pollutants (runoff from land, including that from agriculture and silviculture activities, taking into account the impact of unusually heavy rains, the impact of unusually large snow melts, and the impact of unusually dry weather); and atmospheric pollutants (the impact of airborne dust and pollutants deposited on bodies of water).

While it is true that all these things do affect water quality, EPA places no limits on what it may demand from the states in this regard. Documenting all that EPA is proposing for every Part 1 water body may well be technically impossible, as well as economically infeasible. EPA admits that it knows little about basic water quality for the majority of the nation’s waters, yet this proposal would require states to provide detailed documentation regarding the current and potential water quality of every river, stream, estuary, reservoir, lake and pond—including estimates of what happens in case a hurricane should hit, a drought should occur, or a large dust storm in New Mexico should drop heavier than usual particulate matter on Arkansas.

Under its existing authority, EPA already claims very broad authority to force states to deal with water issues that may arise from any source. Last September, for example, the Governor of Nebraska attacked EPA’s designation of a stretch of the Middle Platte River as “impaired water” because of concerns about high water temperature. He pointed out that the water is warm due to summer sun and low water levels. The Governor recognized that historically when the weather is hot and rainfall scarce, the river temperature rises, just as EPA asserts. However, he wondered, “How can the state control temperature pollution coming from a natural source, like the sun?”¹⁷ EPA will not answer that question because it asserts that it is Nebraska’s responsibility to resolve the problem. Nebraska denies there is a problem, other than one caused by nature. EPA demands a remedy—or may impose one.

The real issue is that of water flow restrictions caused by the existence of the Kingsley Dam on the river. Nebraska contends that the EPA does not have the authority to order the dam torn down or to require higher levels of water flow from the dam.¹⁸ EPA does not assert it has such authority, but continues to demand that Nebraska lower the river water temperature (obviously, by changing water flow). In essence, EPA is using existing water quality standards (temperature) to force a state to

¹⁶ www.epa.gov/owow/tmdl/tmdlsfs.html

¹⁷ *Omaha World-Herald*, September 21, 1999, p.1.

¹⁸ Indeed the Clean Water Act expressly states “It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this chapter.” Sec. 1251(g).

change water flow practices, something it cannot directly regulate. The Proposed Rules would end any doubt about the ability of EPA to force states to impose any control on any activity that now affect or in the future could affect water quality, as defined by EPA.

B. EPA's Proposals are not Supported by Sound Science

While there are real problems with water quality in various lakes, rivers and estuaries, the EPA has little scientific evidence about the extent of the problem. As the Proposed Revisions to the NPDES and Water Quality rule states in background information, “of the 19 percent of the Nation’s rivers and streams that have been assessed, 35 percent of these do not fully support water quality standards or uses and 8 percent of these are threatened.”¹⁹ That means that the water quality in only 1.5 percent of the nation’s rivers and streams are known to be “threatened.”

What is a “threatened waterbody”? EPA defines it as “Any waterbody ... that currently attains water quality standards, but for which existing or readily available data and information on adverse declining trends indicate that water quality standards will likely be exceeded by the time the next list of impaired or threatened waterbodies is required to be submitted to EPA.”²⁰ In other words, so far as EPA can determine, as of its National Water Quality Inventory Report to Congress for 1996, perhaps only 1.5 percent of the nation’s rivers and streams appear to be threatened by an increase in pollution in the future. EPA is, apparently, unable to report anything on the water quality of the other 81 percent of the nation’s rivers and streams (or on 28 percent of the estuary waters, or 60 percent of the lakes, ponds, and reservoirs).

While there is no doubt that there are real water quality issues around the nation, EPA does not provide much evidence on that point. Rational policy, based on evidence of problems, would demand that the Agency collect comprehensive evidence, rather than assert that a massive expansion of detailed regulations are justified because, to the best of the EPA’s knowledge, 1.5 percent of the rivers in the nation *might* violate water quality standards in the future. The fact that just over one-third of the 19 percent of the nation’s rivers surveyed for the National Water Quality Inventory Report (or 6.65% of the nation’s rivers and streams) are not in full compliance with existing water quality standards is not buttressed by evidence that deviations from existing EPA regulations is, in fact, causing harm to the “chemical, physical and biological integrity of the Nation’s waters” as specified by Congress in the Clean Water Act (at 33 USCA § 1251(a)).

EPA recognizes that it has little scientific evidence to support the Proposed Rules. “One option EPA considered was whether it would be appropriate to revise the regulations to require that TMDLs be established only on data and analyses which met very strict quality and analytical standards. EPA concluded that this approach is impractical and would significantly decrease the number of TMDLs that could be established.” (at 46036). However, EPA does not defend why it thinks it is better to have more TMDLs than to have a few meaningful plans for truly impaired water bodies. Critical observers argue that lack of monitoring has left states unable to measure the quality of their waters or the progress made. According to analyst Dr. Richard Halpern, twenty years after the Clean Water

¹⁹ Proposed Rule; see Federal Register, August 23, 1999, Volume 64, Number 162, pp. 46012.

²⁰ *Ibid.* 46047.

Act was passed, only “\$33 million had been spent on monitoring the nation’s water quality, but taxpayers and the private sector had spent more than \$540 billion on technology to fix our water, broken or not.”²¹

“After all this time and money,” two United State Geological Survey water quality specialists reflected recently, “it would be desirable to know whether the [Clean Water] act has worked. Is the water cleaner than it would otherwise have been and have the environmental benefits, however they may be counted, exceeded the costs?” They conclude that decision makers “do not now have the information they need to make wise decisions for the future.”²²

EPA is not to be blamed for the paucity of scientific information; Congress has never chosen to allocate significant funds for this purpose and, similarly, most states do not consistently produce evidence about water quality. No doubt this is because most streams are generally accepted *not* to be in environmental distress. Presumably, the most attention is given to bodies of water that clearly suffer from pollution problems.

C. The Procedural Nature of the Proposed Rule is Both Prescriptive and Open-Ended

The proposed Water Quality Management and Planning rule is both prescriptive and open-ended, leaving states with little flexibility, but substantial responsibility. It requires states to develop lists of impaired water bodies, according to a specified format and using EPA’ prescribed priorities. States must also solicit public input and document the methodology they use to develop the list of impaired water bodies and submit that to EPA eight months before the list is due. While EPA does not assert the authority to approve or disapprove the methodology itself, it will “consider [it] in its review and approval or disapproval of [the] list and priority rankings.”

Since the first lists are due on October 1, 2000, and the methodology is due January 31, 2000,²³ this schedule leaves states very little time for preparing the extensive documentation the proposal requires. Concurrent with the submittal of a state’s list, each state must submit a schedule by which it will develop TMDLs for all Part 1 water bodies. Prior to submittal of lists, priority rankings, schedules, and TMDLs to EPA, states must provide the public with at least 30 days to review and comment on each of these.

As described above, each TMDL must comprise ten elements. These elements themselves are simultaneously prescriptive and open-ended. For example, EPA recognizes that some waterbodies do not meet the water quality standards due to “unknown causes.” Nevertheless, waters impaired by pollutants or *unknown causes* are considered Part 1 water bodies, for which states must develop TMDLs. That is, even if the waterbody is impaired by unknown causes, a state must submit a plan (TMDL) for EPA approval that identifies the pollutant contributing to the impairment, its source, and the amount that it must be reduced. If EPA review of the state-submitted TMDL concludes it

²¹ Halpern, 1995.

²² Debra S. Knopman and Richard A. Smith, "20 Years of the Clean Water Act," *Environment* 35, no. 1 (Jan./Feb. 1993), 17. Knopman and Smith are hydrologists with the U.S. Geological Survey in Reston, Virginia. (As cited by Halpern.)

²³ This deadline will most likely be delayed in the final rule.

does not meet the required elements, EPA will issue an order establishing a new TMDL. Such water bodies will remain on the threatened or impaired list “until water quality standards are attained” (at 46024).

An “approvable” TMDL must include considerations of water quality, habitat, geomorphological, or other conditions that indicate adequate water quality (at 46031). For example, the Proposed Rules say that a state may have to show, among other things, how it can improve spawning of a particular fish by 20 percent by its TMDL plan for a particular water body (at 46031). Whether 20 percent more successful spawning is the “correct” target is at EPA’s discretion. In planning such TMDLs for various water bodies, the state must consider fine sediment from hillsides or river banks, and the variability of such sediment according to the season of the year, the amount of rainfall (“low flow during drought periods” and “high flow nonpoint source runoff” at 46032), and the temperature that “varies as a result of climate and season” (at 46031) and that may affect the impact on water of assorted pollutants. The Proposed Rules recognize that such matters are “extremely difficult to solve” and may be “costly” (at 46031), so the Agency assures the states that it appreciates the complexities they face. However, should a state fail to submit a TMDL plan that satisfies EPA, “EPA has authority to require such an implementation plan as an element of an approvable TMDL” (at 46032).

While the general outlines of the Proposed Rules are based upon water quality standards and implementation plans outlined by Congress at 33 USCA § 1313, EPA has significantly stretched the words of Congress to give itself nearly unlimited control over state waters. Whereas Congress says that water quality plans will take into account “seasonable variations” (33 USCA § 1313(d)(1)(C)), EPA stretches that to be from drought to flood conditions, as noted above. In other words, states, in developing TMDLs must consider the effect of “seasonable variations,” including hundred year floods and unusual droughts. Similarly, while Congress says that water controls should be “stringent enough to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife” (at 33 USCA § 1313(d)(1)(B)), EPA stretches this to include habitat plans under the Endangered Species Act and asserts that it has the option of using the Safe Drinking Water Act standards or new standards that may be developed in the future.

The Proposed Rules grant EPA nearly unlimited authority to impose controls on states. The Proposed Rules are followed by discussion that indicates that in practice the Agency does not intend to implement such sweeping powers except in rare cases. But EPA does not define what these rare cases are.

D. Cost Will Be Significant

EPA has determined that the proposal is a “significant regulatory action” under the terms of Executive Order 12866, and the preamble states that EPA prepared an “Analysis of the Incremental Costs of Proposed Revisions to the TMDL Program Regulations,” which examines the direct costs to states, territories and authorized tribes of developing TMDLs. However, the preamble does not report the results of that analysis (other than to suggest in a separate section that these direct costs will not exceed \$25 million in any one year), nor does EPA post the analysis on its web site. Interested public must go to EPA’s docket to obtain it. The preamble also promises expeditiously to gather information and provide analysis of the costs and benefits of the implementation (by private

parties) of the TMDLs required by the proposal. EPA hopes to make this available for public review and comment before final promulgation of the TMDL rule.

Because EPA states that it does not expect the costs to states, territories and authorized tribes to exceed \$25 million in any one year, it has not conducted an analysis as required by the Unfunded Mandates Reform Act (UMRA) for rules imposing costs on these governmental units or the private sector of \$100 million or more (at 46043). For rules costing more than \$100 million in any one year, UMRA requires agencies to consider, in a written statement, a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that meets the rules objectives.

A 1996 EPA report of the costs to state and local governments of developing TMDLs (based on case studies of 14 TMDLs) provides some insights into potential costs to states, territories and authorized tribes. It found that per-watershed costs ranged from under \$5,000 for small watersheds with single pollutant source and no public participation to over \$1,000,000 for larger watersheds with various sources and more extensive public participation. The studies examined five components of costs: administration, outreach and public participation, analysis, modeling, and data collection and monitoring. If the additional requirements in the proposed rules increase administration and public participation costs by 25 percent, and modeling and analysis costs by 15 percent (we assumed no increase in monitoring and data collection costs due to the proposal), the average *incremental* cost of the proposal would be about \$115,000 per watershed. EPA suggests that over 20,000 waterbodies have been identified as impaired or threatened,²⁴ implying total costs of over \$2 billion. Even if these costs are distributed evenly over the 15-year period during which states must develop TMDLs for all Part 1 waterbodies, it amounts to over \$250 million per year in costs to states, simply for developing plans.²⁵ This rough estimate does not include costs to private citizens of implementing these plans.

²⁴ The Proposed Rules note that the State of Kansas alone needs to produce “TMDLs for over 1,000 waterbodies statewide” (at 46039).

²⁵ The table below summarizes these rough calculations. The low and high estimates for each cost component are from EPA’s 14 case studies, Figures 8a and 8b. The annualized cost estimates are calculated using a 7 percent discount rate.

Cost Component	Mean Cost/watershed In \$1000	Increment attributed to rule	Total Cost/Watershed in \$1000	Total Cost for 20,000 watersheds in \$1,000,000
Administration	50	25%	\$ 12.5	\$ 250
Public Participation	50	25%	\$ 12.5	\$ 250
Modeling	400	15%	\$ 60	\$ 1,200
Monitoring	300	0%	\$ -	\$ -
Analysis	200	15%	\$ 30	\$ 600
	1000		\$ 115	\$ 2,300
Annualized cost over 15 years				\$ 253

The American Legislative Exchange Council (ALEC) observes that states estimate they will incur average costs of \$50 million if the TMDL rule is promulgated.²⁶ This amounts to almost \$275 million per year.²⁷ Other studies of the costs of modeling watersheds (which is not included in the \$2 billion estimate) suggest that these costs also may be significant. The General Accounting Office (GAO) has estimated that current EPA watershed models, costing \$25,000 per study, are insufficient to calculate the consequences of pollutant loadings.²⁸ Better, but not well-tested watershed models by the U.S. Geological Survey are about \$750,000 each, the same GAO report notes. One commentator observed, “conservatively estimating 100 watersheds per state, the bill for their assessment alone could reach \$4 billion.”²⁹

Though based on very rough calculations, we believe the above figures suggest that EPA’s estimate that the proposed changes will cost under \$25 million per year is understated. The cost of producing comprehensive TMDLs, which must potentially account for temperature swings, rainfall (and snow melt) highs and lows, habitat, sedimentation, and a wide variety of pollutants and water quality standards that EPA may rely upon in approving or setting such plans, is clearly a massive undertaking, imposing costs that could well exceed our rough \$250 million estimate in any one year. The states must incur these costs and, due to the open-ended nature of the proposal, are dependent on EPA’s verdict as to whether a particular TMDL is adequate with respect to the various elements contained in the rule.

It is not clear how states will fund this open-ended program. The Proposed Rules note that states “may have difficulty in completely identifying funding sources for all such measures” (at 46034). Left unsaid is how funds are to be produced if not allocated by state legislatures. EPA is putting itself in the position of forcing the states to allocate additional funds to cover the costs of whatever water protection programs EPA asserts it has the authority to mandate on the states.³⁰

EPA also asserts that the Regulatory Flexibility Act does not apply because the Proposed Rules “will not have a significant economic impact on a substantial number of small entities” (at 46041). EPA does not deny that its proposal will not involve compliance costs on small entities, rather *EPA* is not directly ordering any group of small entities to change their methods of operation. EPA asserts, “no impact flows directly from these proposed regulations” (at 46042). The impacts will flow from the states when they implement TMDL plans that they create under the Rules (or that EPA imposes if it disapproves state plans).

Similarly, EPA does not have to comply in this instance with Executive Order 13045, which concerns health or safety risks to children, because the Proposed Rules are not “economically significant” and do not “establish an environmental standard intended to mitigate health or safety

²⁶ Model ALEC Legislation, “State Implementation of Clean Water Act TMDL Requirements,” December 1999.

²⁷ This assumes the \$50 million figure is a present value, and that these costs are distributed evenly over 15 years, using a 7 percent discount rate.

²⁸ GAO, “Water Quality: Federal Role in Addressing and Contributing to Nonpoint Source Pollution,” GAO/RCED-99-45.

²⁹ Oliver A. Houck, “TMDLs IV: The Final Frontier,” 29 Environmental Law Reporter 10469 at p. 13.

³⁰ The American Legislative Exchange Council has responded with model legislation to assist states in setting priorities to meet their obligations under the CWA “in a fashion that recognizes their resource constraints and that is based on sound scientific data.”

risks. Today's proposal is a procedural rule" (at 46045). Of course, the procedures here specifically assert that the Agency may require states to incur or impose substantial economic costs. These costs will divert scarce state, territory, and tribal resources away from programs that may provide much more effective and concrete improvements in children's health and safety.

IV. Market-Based Alternatives Would Respect States' Rights and Improve Water Quality

EPA could recast the TMDL proposal to meet more effectively the Congressional goals of significantly enhancing and protecting the quality of the nation's waters, while respecting its objective regarding "the authority of each State" with respect to the use of its waters (at 33 USCA § 1251(g)). The needs of the states with respect to the uses of their waters, and the causes of and solutions to water pollution problems differ significantly from state to state.

Just as there is diversity among the states in their water needs and water problems, the science of water pollution control is still emerging, and will continue to evolve more rapidly, if the states are allowed to take widely different approaches to water quality management. The Proposed Rule produces great uncertainty among the states and causes them constantly to look to EPA for the agency's currently preferred water pollution control measures. States will have less incentive to find innovative solutions to water problems if they all have the same point of reference—the federal authority, especially if the EPA can reject any part of any state's proposed water plan and impose its own standards and solutions.

The current Clean Water Act regulatory regime has not addressed the real problems that have arisen from the failure of the EPA and the states to address nonpoint water pollution. Most states have not assessed their watersheds because the costs are significant and, quite likely, because the consequences of an honest assessment that reveals pollution problems may be expensive EPA mandates.

On the other hand, to be eligible for certain federal money, the states must declare bodies of water to be impaired. As the governor of Wyoming explained to Congress, "the authority for states to receive federal money for watershed work required that we declare that a waterbody was functionally impaired—regardless of its actual condition. That misunderstood incentive caused many streams to be mislabeled as impaired."³¹ The Proposed Rules would compound this problem, as the states know they may face costs that cannot be predicted given the open-ended nature of the authority EPA is asserting under the Rules.

This section recommends an alternative regulatory structure that would more effectively achieve water quality goals, while complying with existing law.

³¹ Statement of Jim Geringer, Governor of Wyoming, Hearing on Governors' Perspectives on the Clean Water Act Before the Subcommittee on Water Resources and the Environment of the House Committee on Transportation and Infrastructure, 106 Cong. 4 (1999).

A. The TMDL Regulations Should Provide More Flexibility

Refocusing water quality regulation on outcomes instead of inputs (as reflected in the emphasis on TMDLs rather than technology based NPDES effluent limitations) is a major step in the right direction, but greater flexibility is needed if the promise of real water quality improvements and cost savings is to be realized. Given a choice between performance standards that identify and focus on outcomes and technology-based input standards, common sense suggests that environmental protection should be about the environment and how it affects people, not about engineering and permits. Performance or outcome-based water quality management changes the incentives in the right direction. With unconstrained performance standards, polluters have complete flexibility, technologically and economically, in finding effective ways to meet environmental targets. New information and discoveries can be translated quickly into enhanced environmental quality. Profit seeking moves producers in the direction of improved water quality. On the other hand, technology-based input regulation tends to freeze technology, to force a single approach on polluters in the same industry, to blunt the incentive to discover and implement alternate approaches, to reduce competition, and to disregard outcomes. Permitted polluters who adopt approved technologies can expand operations even though environmental loadings may exceed the assimilative capacity of streams for handling discharge. The fact that numerous river segments are environmentally stressed while all dischargers meet EPA engineering standards – and that this situation is destined to get worse – is powerful evidence that input management will not generate environmental protection (at 46016).

The proposed requirement that point-source dischargers who wish to expand first obtain offsets from existing dischargers raises the admirable prospect of gains from trade in the context of a river basin management system.³² However, for EPA to require that offsets of particular amounts and kinds be sought only after technology-based standards are met is just as clearly a step in the wrong direction.

Evidence from experiments on Wisconsin's Fox River that offered permit trading opportunities, the equivalent of market offsets, after EPA technology-based standards were met illustrates the difficulties associated with a hybrid system that attempts to install markets on command-and-control regulation.³³ Touted in the early 1980s as a cost-effective alternative to strict command-and-control regulation for reducing biological oxygen demand (BOD), the Fox River experiment initiated by the Wisconsin legislature in September 1981 offered the prospect of generating annual savings of \$4.5 to \$6.8 million.³⁴ But as environmental economist Tom Tietenberg points out, the large savings were not achieved.³⁵ Only one trade between BOD dischargers was recorded. The requirement that technology standards had to be met prior to entering the market for offsets raised costs and practically eliminated the potential gain from trade. In addition, bureaucratic barriers were then erected by regulators who did not support the concept.³⁶ In a perceptive analysis of what happens when efforts are made to append markets to command-and-control regulation, two water quality management scholars David and Joeres pointed out early on that the Fox River experiment would

³² See U.S. EPA, 1992.

³³ See Meiners and Yandle, 1993, 97.

³⁴ Maloney and Yandle, 1983, p. 312.

³⁵ Tietenberg, 1999, p. 456.

³⁶ Meiners and Yandle, 1993, 97.

suffer because the financial and bureaucratic incentives were not right.³⁷ Their pessimistic forecast proved to be extraordinarily accurate. EPA's proposed TMDL regulation suffers for the same reasons.

B. Decentralized Regulation is Needed

Water quality problems are inherently local or regional, and while there is a national interest in improving environmental quality, there are no national rivers or lakes. Even if there were rivers and lakes that touched every state or most of them, the span of such water bodies would be so large and heterogeneous that decentralized control would naturally emerge. To achieve the largest net gains in water quality benefits, management of water quality should be decentralized. Those best equipped with specialized knowledge and with the greatest incentive to minimize cost and improve water quality should be made responsible and accountable for managing water quality. TMDL regulations should be refocused; they should be cast in terms of property rights protection and the rule of law and focused at the state level. A decentralized approach for water quality management based on the rule of law maintains state supremacy and congressional intent that EPA "consult" with the states.

C. Property Rights and the Rule of Law Form a Solid Foundation for Water Quality Management

Instead of specifying in detailed fashion how states shall proceed in developing TMDLs for all bodies of water within their boundaries and then engaging in continuous water quality planning and monitoring, federal rules for managing water quality should simply require: 1) that each state have a plan for achieving water quality management that provides accountability and liability for damages imposed on holders of environmental rights, and 2) that real data on observed water quality conditions for all major water bodies be provided continually and consistently to the public. The data should be in a form that allows for comparisons to be made across time and space. Obviously, appropriate definitions of "major water bodies" and "real data on observed water quality conditions" would have to be specified.

The rule of law that has evolved through common law courts provides a logical framework for defining legitimate holders of environmental rights.³⁸ Under common law, ordinary people and communities of people hold the right not be harmed against their will. To illustrate, if a discharger of waste imposes costs on parties downstream against their will, the holders of downstream rights have a cause of action against the polluter. If those downstream are citizens of the same state or city populations in another state, the cause of action is the same. State and federal courts provide forums for settling the related disputes. Typically, the remedies are damages and injunction.

If common law rights were enforced, any city that discharged raw sewage that imposed costs on downstream citizens would do so at its own risk. Paying a nominal fine to the EPA, which is the usual result under the current regulatory system, does not get the job done. Any nonpoint-source polluters who allowed runoff from a farm or collection of city parking lots to impose damages on

³⁷ David and Joeres, 1983, p.234.

³⁸ Meiners and Yandle, 1999.

downstream parties would be subject to suit. Any state that allowed damages to befall the citizens of another state could be sued in federal court. And any state that damaged the federal property of citizens of the United States, as in the case of the Florida Everglades or Yellowstone National Park, could be sued by the stewards of that property.

Common law property rights protection introduces an understandable discipline that causes ordinary people to become conscious of and accountable to their neighbors. Common law courts do not issue permits that allow polluters to harm other people. Instead of dealing with the endless technical problems of specifying TMDL for hundreds of thousands of U.S. river segments, the common law process would protect environmental rights. The result of that protection would then yield another form of TMDLs, one based on the prevention of damages to people and the things they value.

To be taken seriously, a proposal for common law protection of environmental rights must reflect on the so-called “race to the bottom,” a concern that citizens of a particular state might choose to become an environmental sink for polluting industries.³⁹ While this may have been a legitimate concern 30 years ago, there is no evidence that a race to the bottom has occurred. People living in California, Oregon, New York, Florida, North Carolina, or any state in the nation simply do not wish to live in an environmental wasteland. Instead of a race to the bottom, the issue today is how to race more quickly to the top.

D. The Rule of Law Can Be Consistent with River Basin and Watershed Management

From the very outset of the nation’s interest in improving water quality, scholars and policy analysts have focused on river basins and watersheds as the appropriate domain for a substantial part of water quality management.⁴⁰ Water quality results from the collective action of all water quality users; it is impossible to achieve collective improvements by focusing on individual discharge points. More than a century of European experience tells us about the relative merits of river basin management.⁴¹ Federal encouragement for building environmental protection on the basis of property rights and the rule of law would support the formation of associations or multi-state compacts for improving water quality. Building on a foundation of law and property rights leaves room for many kinds of institutional experiments.

There are obvious economies associated with defining the boundaries of a proposed solution so that they fit the boundaries of the problem. Very positive U.S. experience is found in the history of the Ohio River 10-state compact, ORSANCO, which led to dramatic improvements in water quality in that region before federal intervention.⁴² A similar experience is seen now in North Carolina’s Tar-Pamlico River Basin Association, which forms a cost-minimizing community of point-source and nonpoint-source dischargers who are collectively improving water quality of the Tar River and Pamlico Sound.⁴³

³⁹ Volokh, Scarlett, and Bush, 1998.

⁴⁰ Dales, 1968; Kneese and Bower, 1968.

⁴¹ Riggs and Yandle, 1997.

⁴² Cleary, 1967.

⁴³ Riggs and Yandle, 1997; North Carolina Department of Environment, Health, and Natural Resources, 1992, U.S. EPA, Office of Water and Office of Policy, 1992.

When ORSANCO was formed in 1948, there were no federal water pollution control statutes. ORSANCO and state and local statutes filled the need. By contrast, when Tar-Pamlico was formed in the 1980s following a massive downstream fish kill, federal statutes had failed to provide water quality protection. Every point-source discharger in the watershed was operating within permit limitations, and nonpoint source dischargers were outside the regulatory control network.

Estimates of the incremental cost of reducing a unit of biological oxygen demand (BOD) in the watershed region varied from 10 cents per kilogram to \$3.15 per kilogram.⁴⁴ At one location in the Tar-Pamlico estuary, reductions of harmful nutrient discharge from an industrial point source ranged from \$860 to \$7,861 per pound eliminated. It was estimated that the same pollutant could be removed by farmers (nonpoint-source dischargers) at a cost of \$67 to \$119 per pound.⁴⁵ In short, the expected gains from trade were sizable.

Today, Tar-Pamlico collects revenues from point-source dischargers who are members of the association. The revenues generated are used in turn to make low-cost purchases of reductions from nonpoint-source dischargers who are not association members. The incentives are right for all parties. Operators of publicly owned treatment works have coordinated capital improvements to minimize the cost of improving water quality and have avoided the installation of more costly yet still ineffective advanced control systems by paying discharge fees. Farmers in the region gain revenues by modifying their cropping operations. Meanwhile water quality has improved in the Tar River. Initial estimates of the command-and-control approach to the problem indicated the cost would be \$50 to \$100 million and water quality would not necessarily be improved. By comparison, Tar-Pamlico is achieving improvements at a cost of \$10 million.⁴⁶ Tar-Pamlico and ORSANCO illustrate just two possibilities that states might take in efforts to improve water quality.

Given a complete range of choices as to how to manage water quality, it is conceivable that a river basin association would take a TMDL approach precisely like the one outlined in EPA's proposed rule. It is also conceivable that an association would follow the path of Tar-Pamlico, which with EPA approval focuses strictly on outcomes and supports contracting for reductions between point-source and nonpoint-source dischargers. People in other states would no doubt discover and implement a range of solutions to the water quality problem that cannot be predicted before the fact. Accountability and water quality protection would be assured by a requirement of liability for damages provided by common law and with a reporting of water quality data required by regulation.

E. EPA Should Be a Consultant to the States; Not a Manager of TMDLs

The evolving state-centered water quality management process still leaves a key role to be played by the EPA. It is not, however, the micro-management role envisioned by the proposed TMDL rules. Quite apart from these rules, the EPA is positioned to be a key consultant to the states in reporting water quality data, analyzing conditions, and providing technical support in the development of

⁴⁴ Yandle, 1993, p. 193.

⁴⁵ EPA Office of Water and Office of Policy 1992.

⁴⁶ Riggs, 1993.

water quality management approaches. If water quality is to be improved, it is critical that reliable data be provided so that citizens and responsible officials can know where, when, and how much progress is being made. If nothing else, the federal government should provide accurate data on environmental quality.

EPA could play an enforcement role in common lawsuits that involve interstate matters and protection of federally managed assets. Obviously, the adjustment from enforcer of command-and-control, technology-based standards to the role of consultant in a common-law world will not come easily. But change is important.

Far more is known today about water quality management than was known in 1972 when the current Clean Water Act was passed into law. Even if the economic makeup of the country had not changed, there would be reason to reexamine and perhaps change the regulatory assumptions that supported that first major statute. But the economy has changed dramatically. The United States is no longer a smokestack economy; it is primarily a services economy. The major water pollution control challenges have also changed. Instead of industry, it is now municipalities and nonpoint sources that continue to pollute. Instead of just effluent discharge, it is also air emissions. The institutions of the past do not fit the challenges of the present and future.

V. Conclusions and Recommendations

EPA's proposed changes to its water quality planning and management regulation may reflect an effort to shift from technology-based controls determined at a federal level, to controls based on the characteristics of individual watersheds. This is an important transition, and a watershed approach to meeting water quality goals is more conducive to a focus on outcomes, rather than inputs, which has dominated water quality management in the past. However, EPA's prescriptive, procedural rule is likely to undermine the benefits of a watershed approach.

Centralizing decision making with EPA for hundreds of thousands of river segments, lakes, and coastal zone regions complicates and delays decision making about matters that are inherently local. The regulatory framework proposed by EPA, with its combination of command-and-control, technology-based regulation with offsets and trading has not succeeded in meeting water quality goals in the past and is not likely to succeed now.

River basins, watersheds, and coastal regions are natural units for managing water quality. EPA's approach for TMDL must allow for and encourage the recognition of alternate geographic governance units that minimize the environmental cost of achieving improvements in water quality.

A water quality management system based on the rule of law and protection of environmental rights can be devised so that the goals of TMDL can be achieved. The system must include accountability and responsibility for actions that affect environmental quality. The system must allow for flexibility in the development of regulatory institutions and processes so that regional differences in benefits and costs can be taken into account.

References

American Legislative Exchange Council, Model State Legislation, “Total Maximum Daily Load Implementation Act.” December 1999. (www.alec.org.)

Cleary, Edward J. 1967. *The Orsanco Story*, Baltimore, MD: John Hopkins Press.

Dales, J.H. 1968. *Pollution, Property and Prices*. Toronto: University of Toronto Press.

David, Martin H. and Erhard F. Joeres. 1983. Is a Viable Implementation of TDPs Transferable? Erhard F. Joeres and Martin H. David, eds. *Buying a Better Environment*, Madison, WI: University of Wisconsin Sea Grant Technical Report No. 239, Land Economics Monograph No. 6: 233-248.

Halpern, Richard A. Ph.D., “Where Have All the Nutrients Gone? Virginia’s Livestock Agriculture and the Chesapeake Bay.” 1995.

Kneese, Allen V. and Blair T. Bower. 1968. *Managing Water Quality: Economics, Technology, and Institutions*. Baltimore, MD: Johns Hopkins University Press.

Maloney, M.T. and Bruce Yandle, 1983. Building Markets for Tradable Pollution Rights. Terry L. Anderson, ed. *Water Rights*, San Francisco, CA: Pacific Institute for Public Policy Research, 283-320.

Meiners, Roger E. and Bruce Yandle. 1997. Clean Water Legislation: Reauthorize or Repeal? Roger E. Meiners and Bruce Yandle, eds. *Taking the Environment Seriously*. Lanham, MD: Rowman & Littlefield Publishers. 73-101.

Meiners, Roger E. and Bruce Yandle. 1999. Common Law and the Conceit of Modern Environmental Policy, *George Mason Law Review*, 7 (Summer): 923-963.

North Carolina Department of Health, Environment and Natural Resources. 1992. Tar-Pamlico NSW Implementation Strategy. Raleigh, NC (February 13).

Riggs, David and Bruce Yandle. 1997. Environmental Quality, Biological Envelopes and River Basin Markets for Water Quality. Terry L. and Peter J. Hill, eds. Anderson. *Water Marketing—the Next Generation*. Lanham, MD: Rowman & Littlefield, Publishers.

Tietenberg, Tom. 1999. *Environmental and Natural Resource Economics*. Reading, MA: Addison-Wesley.

U.S. EPA. 1992. Office of Water. Managing Nonpoint Source Pollution. EPA 506/9-90. Washington, DC: EPA (January).

U.S. EPA. 1992. Office of Water and Office of Policy. Incentive Analysis for Clean Water Act Reauthorization: Point Source/Nonpoint Source Discharge Reductions. Washington, DC: EPA (April).

Volokh, Alexander, Lynn Scarlett and Scott Bush. 1998. *Race to the Top: The Innovative Face of State Environmental Management*. Los Angeles, CA: Reason Public Policy Institute.

Yandle, Bruce. 1997. Community Markets to Control Agricultural Nonpoint Source Pollution. Roger E. Meiners and Bruce Yandle, eds. *Taking the Environment Seriously*. Lanham, MD: Rowman & Littlefield Publishers, 185-207.

Appendix I

RSP Checklist

Water Quality Management (TMDLs, NPDES, and WQS)

Element	Agency Approach	RSP Comments
1. Has the agency identified a significant market failure?	<p>The regulations would address water bodies that are not meeting standards due to regulatory and market failures, on a watershed by watershed basis.</p> <p>Fair</p>	<p>EPA’s historic focus on command-and-control and technology-based standards has not achieved water quality goals in some water bodies. EPA correctly recognizes that a waterbody focus is likely to produce better outcomes in terms of reduced harm to humans and aquatic life.</p>
2. Has the agency identified an appropriate federal role?	<p>EPA’s goal is to provide states with “clear, consistent, and balanced direction.” It would dictate the elements and procedures by which states would manage local waterbodies.</p> <p>Unsatisfactory</p>	<p>Both the Clean Water Act and the inherently local nature of water bodies argue for a more flexible, state-lead approach. Yet EPA’s prescriptive, procedural rule is likely to undermine state’s efforts to meet their own unique needs.</p>
3. Has the agency examined alternative approaches?	<p><i>EPA rejects alternatives that would focus resources on a smaller number of higher priority waterbodies.</i></p> <p>Unsatisfactory</p>	<p>EPA should consider alternatives that offer more state flexibility to develop regulatory institutions and processes that take regional differences in water use and characteristics into account.</p>

Element	Agency Approach	RSP Comments
4. Does the agency attempt to maximize net benefits?	<p><i>EPA suggests that the rule will cost states less than \$25 million per year, but does not estimate its benefits.</i></p> <p>Unsatisfactory</p>	<p>Under UMRA and Executive Order 12866, EPA is required to do a more complete analysis of the benefit and costs of these proposals. Our rough estimates suggest that EPA's cost figure is understated by a factor of about 10.</p>
5. Does the proposal have a strong scientific or technical basis?	<p><i>EPA has little scientific evidence about the extent and nature of water quality problems around the nation.</i></p> <p>Unsatisfactory</p>	<p>EPA should not proceed without sufficient scientific evidence of the existence of a national problem that cannot be addressed by regional, state and local efforts.</p>
6. Are distributional effects clearly understood?	<p>EPA does not address distributional effects of the proposals.</p> <p>Unsatisfactory</p>	
7. Are individual choices and property impacts understood?	<p><i>EPA's approach does not recognize the effect its rules will have on state incentives and property rights.</i></p> <p>Unsatisfactory</p>	<p>A market-based approach will respect states' rights, provide incentives for innovative solutions to water problems, and improve water quality.</p>