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January 9, 2015

Matthias St. John
Executive Officer
North Coast RWQCB
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

VIA ELECTRONIC MAIL c/o Alydda Mangelsdorf, Alydda.Mangelsdorf@waterboards.ca.gov

RE: Staff Report for the 2014 Triennial Review of the Water Quality Control Plan for the North Coast Region

Dear Executive Officer St. John:

Earth Law Center (ELC) is a 501(c)(3) non-profit that advances legal rights for ecosystems and species to be healthy, thrive and evolve. ELC asks that the North Coast Regional Water Quality Control Board (NCRWQCB) follow the lead of the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) and include the instream flow objective (hereinafter "watershed hydrology objective") as a "high priority" item on the 2014 Triennial Review of the Water Quality Control Plan for the North Coast Region (2014 Triennial Review), due to its many potential benefits for protecting waterways and aquatic species region-wide. ELC also asks that the watershed hydrology objective be developed and implemented consistent with the Clean Water Act (CWA), a process followed already in other states. Related comments by ELC on this topic, dated June 2014, are attached and incorporate by reference. ELC also incorporates by reference the January 9, 2015 comments submitted by the Karuk Tribe.

In 2005, the U.S. EPA awarded grant funding for the NCRWQCB and SFRWQCB to develop a Stream and Wetland System Protection Policy[1] (Policy) as a Basin Plan amendment in both Region 1 and Region 2. The proposed Policy includes new beneficial uses and water quality objectives as well as an implementation plan. One of the proposed objectives developed as part of the Policy is the watershed hydrology objective, which would make the connection between the pattern and range of flows and the protection of beneficial uses. The Policy was identified as a high priority by the NCRWQCB in the 2004 and 2007 Triennial Reviews. Beginning with the 2011 Triennial Review, the NCRWQCB began to list the watershed hydrology objective as a separate task (while noting that the draft objective is still part of the Policy).

However, neither the Policy nor the watershed hydrology objective is included on the NCRWQCB 2014 Triennial Review list of "high priority" items, despite the fact that the Policy

[1] The 2014 Triennial Review additionally uses the phrase "Stream and Wetlands [plural] System Protection Policy," while the SFRWQCB typically uses the phrase "Stream and Wetland Systems [plural] Protection Policy."

is listed at the top of the SFRWQCB's own 2012 Triennial Review Prioritized List of Basin Plan Projects.[2] Indeed, significant progress already made by the SFRWQCB in partnership with the NCRWQCB in developing the watershed hydrology objective, including drafting of the watershed hydrology objective language[3] and development of a January 2010 peer-reviewed scientific justification for the watershed hydrology objective (along with other elements of the Policy).[4] ELC asks that the NCRWQCB complete this effort by, at minimum, prioritizing the watershed hydrology objective in its 2014 Triennial Review, with the intention of adopting and implementing a strong objective as soon as possible, but at least within the next three-year period.

Prioritization of the watershed hydrology objective would result in numerous practical benefits. First, the watershed hydrology objective would assist the State Water Resource Control Board's (SWRCB) Division of Water Rights in making regionally appropriate water rights decisions. Second, as noted in the Staff Report for the 2014 Triennial Review, the watershed hydrology objective would "[support] the development of implementation measures which protect instream flows" until needed numeric flow criteria can be developed on a stream or watershed level.[5] Third, the watershed hydrology objective would formally recognize the relationship between changes to hydrological patterns (including flow) and beneficial use protection;[6] in practice, this connection could be used to ensure that "individual projects and permits are designed and evaluated to support watershed health and avoid adverse cumulative effects,"[7] among other purposes. Fourth, the watershed hydrology objective would help clarify the relationships among flow and other parameters regulated by the NCRWQCB, such as

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[2] San Francisco Regional Water Quality Control Board, Resolution No. R2-2012-0088, Att. A ("2012 Triennial Review Prioritized List of Basin Plan Projects"), November 14, 2014, at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basinplan/web/docs/Triennial_Review/2012%20Triennial%20Review%20and%20Priority%20Projects%20-%2011-12%20signed.pdf.

[3] The proposed watershed hydrology objective reads as follows: "The hydrologic connectivity between headwaters and estuary, surface water and ground water, and landscape, floodplain, and stream channel shall be protected to produce the pattern and range of flows necessary to support beneficial uses and a functional ecosystem." Ho, Bruce & Livsey, Ben, "Staff Report for Amendments to the Water Quality Control Plans for the North Coast and San Francisco Bay Regions to Protect Stream and Wetland Systems," External Peer Review Draft, p. 116 (2009), at: http://earthlawcenter.org/static/uploads/documents/Peer_Review_Draft_Staff_Report_SWSPP_Jan_13_2010.pdf (hereinafter "Peer Review Staff Report for the SWSPP").

[4] *See* Peer Review Staff Report for the SWSPP. The NCRWQCB has not assisted with this work since 2008, citing the loss of resources and higher priorities.

[5] North Coast Regional Water Quality Control Board, "2014 Triennial Review of the Water Quality Control Plan for the North Coast Region," p. 19 (Nov. 21, 2014).

[6] As described by Poff *et al*., "[m]odification of the natural flow regime dramatically affects both aquatic and riparian species in streams and rivers worldwide." *See* Poff *et al*., "The Natural Flow Regime," 47(11) BIOSCIENCE (1997).

[7] *See* Peer Review Draft Staff Report to Support the Technical Sediment Total Maximum Daily Load for the Upper Elk River and Associated Documents, App. 6A, p. 6A-2, at: http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/130719_staff_report/staff_report/appendices/Appendix_6A_Watershed_Hydrology_Objective.pdf (Draft Staff Report for the Upper Elk River Sediment TMDL). States the Draft Staff Report for the Upper Elk River Sediment TMDL, "Staff proposes that the Regional Water Board consider adopting a watershed hydrology objective either as part of an action taken specific to the Elk River watershed (if a site specific objective) or as part of another related Basin Plan Amendment (if a region wide objective)." *Id.* In either case, the watershed hydrology objective could "[acknowledge] the connection between flow and sediment in Upper Elk River." *Id.*, at p. 6A-1. The TMDL specifically refers to the language of the proposed watershed hydrology objective as developed in the Peer Review Staff Report for the SWSPP.

sediment, temperature and bio-stimulatory substances; this could guide efforts to protect and recover waterways more effectively than under existing water quality objectives.[8] Fifth, the watershed hydrology objective would help North Coast staff identify waterways that are impaired due to altered flow – namely in close cases, since beneficial uses (including use as fish habitat) in the most severely dewatered rivers and streams are clearly impaired due to altered flow and must be listed as such.[9]

Moreover, in its August 2014 Resolution approving the 2012 303(d) List, the NCRWQCB specifically directed staff to "coordinate with the Division of Water Rights on the development of flow objectives or other flow criteria, as appropriate," noting that "a watershed hydrology objective that describes narrative goals for the timing, quantity, and distribution of water could be incorporated into the Basin Plan…."[10] SWRCB staff also recently reiterated the need to develop "a narrative water quality objective related to surface flows" to assist with a flow assessment methodology;[11] further delay of this work will similarly delay full recovery of North Coast rivers and streams to a healthy status. In sum, a region-wide flow objective can begin to restore health to all of the waterways and aquatic species – including salmon and steelhead – that suffer from inadequate flow throughout the North Coast, rather than just some of the waterways.

As discussed in our June 18, 2014 comments to the NCRWQCB (attached), it is also important that any watershed hydrology objective be developed in compliance with CWA provisions for the protection of beneficial uses. The CWA requires states to develop water quality standards that include: beneficial uses, criteria (called "objectives" in California) that protect the beneficial uses, and antidegradation requirements. U.S. EPA regulations make clear that where there are multiple uses, states must adopt objectives that protect the *most sensitive* uses, based on science.[12] Under the Supremacy Clause, state law that only provides for "reasonable" protection, and/or that "balances" uses (such as in oft-quoted California Water Code language), does not preempt the more protective CWA, including the CWA's requirement that objectives fully protect beneficial uses. As the U.S. Supreme Court found in *PUD No. 1 of Jefferson County v. Washington Dep't of Ecology*, 511 U.S. 700 (1994), the distinction between

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[8] For example, in the context of the Technical Sediment TMDL for the Upper Elk River, North Coast staff noted that "[w]hile the existing water quality objectives for sediment are helpful, an explicit objective describing the connectivity of watershed hydrology and beneficial use support and prevention of nuisance is helpful to guide recovery and protection efforts." *See id.* at p. 6A-1. Further, as noted by the Peer Review Staff Report for the SWSPP, "[w]hile existing beneficial uses and water quality objectives in the Basin Plans for the North Coast and San Francisco Bay Regions address to some degree the need to protect water quality and wildlife habitat they do not explicitly address the need to protect the physical condition and integrity of the structure, dynamics, and functions of these systems." Peer Review Staff Report for the SWSPP, p. 114.

[9] *See* ELC's comments on this topic, at: http://www.earthlawcenter.org/static/uploads/documents/303d_listings_letter_May_15_2013_1.pdf and at http://earthlawcenter.org/static/uploads/documents/303d__Ltr_NorCal_Flows_Res_and_Staff_Rpt.pdf.

[10] NCRWQCB, Resolution No. R1-2014-004311 (Aug. 14, 2014), at: http://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2014/140814_0043_IR_Resolution_Adopted.pdf.

[11] SWRCB, "Staff Report for the 2012 California Integrated Report," Dec. 31, 2014, p. 11, at: www.waterboards.ca.gov/water_issues/programs/tmdl/docs/draft_staff_report_2012_ir.pdf.

[12] EPA regulations state that "criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use." *See* 40 CFR § 131.11; *see also* 40 CFR § 131.6.

water quality and water quantity is "artificial"; if waterways are dewatered such that one or more beneficial uses cannot be met, then water quality standards are being violated.

U.S. EPA Regions 1 and 4 (and perhaps elsewhere) have already acted in support of adoption of "instream flow water quality standards" that are consistent with the CWA. As of the end of 2012, eight states (New Hampshire, Rhode Island, Vermont, New York, Virginia, Kentucky, Tennessee, and Missouri) and three tribes had already adopted such CWA-compliant instream flow water quality standards, and others are investigating adoption of such standards. As an example, Tennessee's narrative instream flow water quality standards read: "Stream or other waterbody flows shall support the fish and aquatic life criteria," and "Stream flows shall support recreational uses." Kentucky's narrative standard similarly reads: "Flow shall not be altered to a degree which will adversely affect the aquatic community." The North Coast could likewise apply CWA concepts to the development of a straightforward and CWA-compliant regional watershed hydrology objective that protects aquatic life and ecosystem functions.

Once adopted, instream flow water quality standards that are consistent with the CWA can be used for the "*protection of all designated uses and for application in all other purposes under the CWA.*"[13] One such example comes from U.S. EPA Region 1, which has recommended that NPDES permits consider flows needed to protect uses in light of proposed discharges, and that "fishery management/restoration plans … be integrated into water quality standards."[14] U.S. EPA Region 1 also specifically found that antidegradation programs must "obviously address water withdrawals as well as discharges," to ensure there is "adequate ability to protect existing uses";[15] this position should similarly be reflected in the NCRWQCB's flow operations.

Considering the dire need for more flow in a number of North Coast waterways, the numerous benefits of the watershed hydrology objective, the strong legal impetus of the CWA, and the clear precedent set by other states, tribes and U.S. EPA regions, we ask that the NCRWQCB recognize the watershed hydrology objective as a "high priority" item in the 2014 Triennial Review and apply CWA concepts in development and implementation of the objective.

Thank you for your attention to these comments.

Best regards,

Grant Wilson
Outreach and Policy Coordinator
gwilson@earthlaw.org

[13] Letter from U.S. EPA Region 4 to Alabama Department of Environmental Management (2012), pp. 9-14, attached to June 18, 2014 ELC comments to the NCRWQCB (emphasis in original). U.S. EPA Region 4 also specifically encouraged states to "consider adopting environmental flow standards under the CWA based on a 'natural flow paradigm' that more closely resembles natural conditions."
[14] *See* Letter from U.S. EPA Region 1 to the Rhode Island Department of Environmental Management, p. 4 n. 1, attached to June 18, 2014 ELC comments to the NCRWQCB.
[15] *Id.*, at p. 3.

Attachments:
Letter from ELC to North Coast Regional Water Quality Control Board (June 18, 2014); includes the following two relevant attachments:

Letter from U.S. EPA Region 4 to Alabama Department of Environmental Management (Nov. 19, 2012)

Letter from U.S. EPA Region 1 to Rhode Island Department of Environmental Management (June 25, 1996)

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June 18, 2014

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VIA ELECTRONIC MAIL: Patti.Corsie@waterboards.ca.gov

RE: 2014 Triennial Review of the Water Quality Control Plan for the North Coast Region

Dear Executive Officer St. John:

Earth Law Center (ELC) is a 501(c)(3) non-profit that advances legal rights for ecosystems and species to be healthy, thrive and evolve. ELC welcomes the opportunity to provide these comments on the development of a flow (hydrology) objective in the 2014 Triennial Review of the Water Quality Control Plan (Basin Plan) for the North Coast Regional Water Quality Control Board (NCRWQCB). ELC incorporates by reference the comments of the Karuk Tribe on this matter as well.

As noted in the letter from the Karuk Tribe, a flow objective is critical to the protection of beneficial uses of the North Coast Region, and should be a top priority for the 2014 Triennial Review of the Basin Plan. In the 2004 Triennial Review, the Stream and Wetland Riparian Policy (SWRP) was listed as a high priority item; the SWRP proposed a Watershed Hydrology Objective that would make the linkage between the pattern and range of flows and the protection of beneficial uses. This objective would also assist the State Water Resource Control Board's Division of Water Rights in making regionally appropriate water rights decisions. We support the development of such an objective, and would like to add the following comments on its development.

Specifically, in developing a flow objective for the NCRWQCB region, consideration should be given to compliance with the federal Clean Water Act's (CWA) provisions for protection of beneficial uses. The CWA was established to "restore and maintain the chemical, *physical*, and biological integrity of the Nation's waters." (Emphasis added.) The CWA further requires states to develop water quality standards that include: (1) beneficial uses, (2) criteria ("objectives" in California) that protect the beneficial uses, and (3) antidegradation requirements. U.S. EPA regulations make clear that where there are multiple uses, states must adopt objectives that protect the *most sensitive* uses (40 CFR § 131.11), which often relate to flow-impacted fish and other aquatic life.

The U.S. Supreme Court discussed the applicability of the CWA to flows in *PUD No. 1 of Jefferson County v. Washington Dep't of Ecology*, 511 U.S. 700 (1994), which upheld Washington State's decision to condition a CWA Section 401 certification on minimum flow

requirements to protect fish habitat. The Court found the distinction between water quality and quantity to be "artificial," pointing out that if waterway flows are allowed to be diverted to the point where one or more beneficial uses cannot be met, then water quality standards – which mandate protection of beneficial uses – are being violated. In upholding Washington's minimum flows requirement in its Section 401 certification, the Court specifically found that the CWA does "not limit the scope of water pollution controls that may be imposed on users who have obtained, pursuant to state law, a water allocation." Conversely, state actions on flow that violate designated uses (such as state adoption of flow criteria that endanger fish populations) arguably run counter to CWA requirements.

A number of states are already using the CWA as a tool to improve flows, with the active support of U.S. EPA (such as in U.S. EPA Regions 1 and 4). For example, states have of course used the Section 401 certification process to protect flows, as demonstrated in *PUD No. 1*. In addition, as of the end of 2012, eight states (New Hampshire, Rhode Island, Vermont, New York, Virginia, Kentucky, Tennessee, and Missouri) and three tribes had already adopted "instream flow water quality standards" under the CWA, and others are investigating adoption of such standards. (Tennessee's narrative instream flow water quality standards, for example, read: "Stream or other waterbody flows shall support the fish and aquatic life criteria," and "Stream flows shall support recreational uses.")

As concluded in the attached letter from U.S. EPA Region 4 to the Alabama Department of Environmental Management (*see* pages 9-14), instream flow water quality standards adopted consistent with the CWA could be used for the "*protection of all designated uses and for application in all other purposes under the CWA*." Examples include those listed by U.S. EPA Region 1, which has recommended that NPDES permits consider flows needed to protect uses in light of proposed discharges, and that "fishery management/restoration plans … be integrated into water quality standards." (*See* attached letter from U.S. EPA Region 1 to the Rhode Island Department of Environmental Management.) U.S. EPA Region 1 also found that antidegradation programs must "obviously address water withdrawals as well as discharges."

In light of the guidance provided by the U.S. Supreme Court and U.S. EPA on the application of the CWA to the development of "instream flow water quality standards," and the experiences of states and tribes in adopting and implementing these flow standards, we ask that the NCRWQCB consider and apply these concepts in the development of flow objectives in the North Coast Basin Plan. If you have any questions regarding these comments, including requests for contacts in U.S. EPA Region 4, or would like additional information, please do not hesitate to contact us. Thank you.

Sincerely,

Linda Sheehan
Executive Director
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attachments

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NOV 19 2012

Lance LeFleur
Director
Alabama Department of Environmental Management
Post Office Box 301463
Montgomery, Alabama 36130-1463

Dear Mr. LeFleur:

Thank you for the opportunity to provide input into the State of Alabama's development of a comprehensive statewide water management plan. The Environmental Protection Agency strongly supports Governor Bentley's directive to develop a plan that is based on sound science and that will "benefit Alabamians now and for generations to come." As we have discussed at the most recent State Directors meetings, our stewardship of water resources in the Southeast is facing new challenges from increased demands on limited freshwater supplies. Your effort acknowledges that competing uses of ground water and surface water for industrial, municipal and agricultural uses, power generation, new reservoirs, inter-basin transfers and water diversions are all bringing this issue into sharp focus. Planning is further complicated by droughts, floods, climate change and existing hydrologic modifications.

Fortunately, our understanding of the science of water management has evolved significantly over the past decade. We applaud your efforts to bring this science to bear in assisting Alabama's efforts to balance multiple water needs. Long-term planning for the stewardship of Alabama's waters will serve to protect the significant ecological resources of the state, as well as ensure future delivery of drinking water, power generation and sustainable economic development.

The EPA has been working to better understand the complex issues of addressing water quantity and water quality effectively under the existing authorities of the Clean Water Act (CWA). The EPA Region 4 has had the benefit of working with other state and federal partners that have long been involved in this issue. For instance, population pressures and water disputes compelled many states in New England to begin development of water plans more than twenty years ago. All six of the New England states have developed hydrologic protection of state waters either through their state water quality standards program under the CWA and/or through state water allocation and permitting programs. The eight states surrounding the Great Lakes, facing challenges of competing water uses, spurred development of water plans under the Great Lakes and St. Lawrence Seaway Compact, including innovative tools such as Michigan's Water Withdrawal Assessment Process and Internet Screening Tool. Alabama can draw on such tools, expertise, innovation and success both here in the Region and nationally. We have provided several examples in our comments and would welcome the opportunity to share with you any of these resources and contacts in the coming year as you develop and refine your plan.

As requested, the EPA has completed a review of the *Water Management Issues in Alabama* report. Our comments include recommendations about how Alabama could utilize tools that are already available under the CWA to address many of the State's water resource issues, with a focus on efficiency, conservation and reuse, and development of instream flow water quality standards under the CWA. We support Alabama's water conservation and efficiency efforts, which can be a key component in water resource management. In addition, the EPA recommends that the State consider using its CWA authority under the water quality standards program to develop "instream flows which can serve as a cornerstone

of a statewide water management plan" (*Water Management Issues in Alabama*, Alabama Water Agencies Working Group, pg. 6). We further support the proposal to examine and recommend "appropriate flow dynamics for rivers and streams to support biological, recreational, and industrial/transportation needs and requirements" (Id., pg. 4), and have included examples of successful flow standards from throughout the country. We share with you the expectation, as you move forward, that all newly developed water plans and policies will of course be consistent with your state water quality standards under the CWA.

Our enclosed comments follow the format of the Water Issues Area Summaries while also addressing the 2009 recommendations from the Permanent Joint Legislative Committee on Water Policy and Management and the areas of stated importance from the Governor in his charge to the Alabama Water Agencies Working Group in April 2012.

With the benefit of evolving research in this area, we believe it is possible to develop the tools needed to protect, and where possible restore, the hydrologic condition and ecological integrity of state waters, while efficiently carrying out necessary and important water supply planning and economic development. We stand ready to assist your group in any way possible, and please do not hesitate to contact me at (404) 562-9470 or Ms. Lisa Perras Gordon at (404) 562-9317 if you have any questions.

Sincerely,

James D. Giattina
Director
Water Protection Division

Enclosure

cc: Glenda Dean

Alabama Water Agencies Working Group
EPA Region 4 Stakeholder Comments
November 2012

The Region 4 office of the Environmental Protection Agency (EPA) has reviewed the report entitled *Water Management Issues in Alabama* (the WMI Report) by the Alabama Water Agencies Working Group (AWAWG) and offers the following stakeholder input.

General Stakeholder Input

The EPA supports the development of a statewide water management plan as detailed in the WMI Report. The EPA's two primary issues for stakeholder input are conservation and reuse, and the recommendation to develop instream flow water quality standards. The EPA is also providing comments below in seven other areas. In addition to those comments, the EPA is providing information regarding the significance of Alabama's aquatic ecology that was not included in the WMI Report.

Alabama's globally significant aquatic biodiversity

The United States is often cited as one of the top countries in the world for aquatic biodiversity, ranking 1st for crayfishes, freshwater mussels, freshwater snails and many aquatic insects and 7th for fish diversity. In fact, whereas the U.S. has over 300 species of freshwater mussels, all the rivers of Europe have only 10 and the entire continent of Africa just 56. There is no question that Alabama is at the heart of the U.S. freshwater diversity, with more species of mollusks (180 species of both snails and mussels) and fish (>300 species) than any other state (ADCNR 2012). *Rivers of Life*, a NatureServe report on aquatic biodiversity, highlights the state of Alabama in general and the Mobile River basin in particular as having "extraordinarily diverse assemblages of freshwater animal species..." and also references the Cahaba River which it describes as a "treasure trove of botanical life" (Master et al. 1998). However, the report notes that many of Alabama's species are vulnerable. In fact, Tennessee and Alabama came in 1st and 2nd for the greatest number of imperiled freshwater species nationally. The report finds that just two regions of the U.S., one of which is the Mobile River Basin, are home to 35% of all vulnerable species in the U.S. Seventy percent of those species occur nowhere else in the world. Conservation practices and development of instream flow protections may provide the safeguards needed for many of these species that make Alabama a unique ecological treasure.

Freshwater ecosystems, as a whole, have suffered more decline than terrestrial ecosystems in recent decades (Master et al. 1998). Nationally, aquatic systems are under significant stress, and particularly in the Southeast, with the largest number of imperiled species. More than two centuries of alterations to aquatic habitat, such as dams, surface water and ground water withdrawals, impervious cover, introduction of non-native species and channelization have significantly altered the aquatic environment. Only recently have scientists begun to quantify the extent of that alteration. In a national assessment, the U.S. Geological Survey found that alteration of waterways has impacted the magnitude of minimum and maximum streamflows in more than 86% of monitored streams nationally and may be the primary cause of ecological impairment in river and stream ecosystems (Carlisle et al. 2011). Every aspect of the lives of aquatic plants and animals is cued by and inextricably linked to the natural variability of our rivers and streams (Southern Instream Flow Network 2010). Alterations and reductions in stream flow and fragmentation of our waterways concentrate toxic and conventional pollutants, reduce fish passage, increase stream temperatures, increase predation, reduce access to stream bank habitat, eliminate the

connectivity to feeding and breeding locations in the flood plain and in some instances even eliminate stream flow altogether.

The EPA supports Governor Bentley's efforts to create a statewide comprehensive water plan that includes instream flow protection which may provide protection for Alabama's significant aquatic biodiversity. The EPA applauds this movement towards greater stewardship of these resources and hopes that with public outreach citizens can take even greater pride in their state's ecological riches.

Little was mentioned of Alabama's global significance in this area in the WMI Report. EPA encourages the AWAWG to acknowledge and support the exceptional aquatic biodiversity of Alabama as it works toward the completion of the statewide water management plan.

Water Issue Area Specific Comments

Water Resources Management

As a means of managing and planning for water supply while minimizing impacts to public resources such as streams and wetlands, we encourage the state to place up-front emphasis on conservation and management principles.

Fixing ~~leak~~king infrastructure and incentivizing efficient use can free up significant supply already in the treatment and distribution system, often closing demand-supply gaps at a fraction of the cost of developing new supply. Whereas many distribution systems have unaccounted-for water (UAW) volumes upwards of 20-30%, states that have UAW goals generally target losses of no more than 10-15% (EPA 2010a). With its *Water Conservation Standards* of 2006, for example, Massachusetts established that water suppliers should conduct annual audits and semi-annual system-wide leak detection surveys with a goal of reducing UAW volumes to below 10%. Suppliers must then work towards fixing system leaks and reducing unaccounted-for water, with regular reporting requirements. Fixing leaks and managing system losses can increase financial benefits because water treated and transported through the distribution system, but lost before reaching an end user, is unbilled and thus represents revenue loss that could be recovered. In the mid-1990s, for example, Gallitzin, Pennsylvania's small distribution system was experiencing high water losses exceeding 70% (EPA 2002). After a thorough leak detection and mapping effort, the authority initiated a leak repair program and a corrosion control program at the water treatment plant. Just four years after implementation, delivery had decreased by 68%, with UAW down to 9%. Chemical treatment and energy cost decreases were 47% and 61%, respectively, which allowed the authority to keep water rates down.

Projects that impact hydrology, such as new or expanded water supply, development, and recreational or amenity impoundments, often require Clean Water Act (CWA) Section 404 permits, making them subject to review for compliance with the 404(b)(1) Guidelines. In reviewing such projects EPA considers whether the applicant has demonstrated adherence to the mitigation sequence, with avoidance and minimization of impacts to aquatic resources as the first two steps. EPA also reviews proposed projects for full consideration of alternatives in selection of the Least Environmentally Damaging Practicable Alternative. For water supply project proposals, full implementation of conservation and

efficiency measures, including water reuse options, is a primary alternative that could have a fraction of the impacts to aquatic resources of developing new supply infrastructure. A study that surveyed multi-family residential units across several cities found that the introduction of sub-metering reduced water consumption by 10-26% (Mayer et al. 2004). EPA looks for such measures to minimize or altogether avoid aquatic resource impacts. A state water management plan can serve as the policy basis for prioritizing projects that use and improve upon existing infrastructure, and make use of existing investments so that they have less impact to aquatic resources. A state plan can facilitate such measures being considered together as a comprehensive approach rather than in isolation.

When water supply projects are determined to be necessary, demonstrated maximization of conservation and efficiency measures can facilitate federal permit review. Any new supply development (such as a reservoir) should be sized appropriately for the documented purpose and need, and designed to mimic the natural conditions as closely as feasible in the downstream waters. Dewatering of the downstream segments should not be allowed during the filling stages of impoundments. Many of these projects require long-term financial and maintenance obligations, which should be outlined and accounted for in all applications to ensure protection of the water quality necessary to protect designated and existing uses throughout the life of the project. The maintenance of impoundments, including the costs for activities such as dredging of sediments, is often not adequately considered, and can lead to degradation of resources. Whereas free-flowing streams can be economic boons by bringing recreational users and tourism, with associated hospitality and recreational gear business, reservoirs can be an economic liability. One such example is that of the Hickory Log Reservoir in Canton, Georgia. Costs for that reservoir have increased to more than five times the original estimate, creating an economic burden threatening other fundamental needs of the city. *The Atlanta Journal-Constitution* reported in June 2012 that water bills for city of Canton customers have increased 30% to pay for expenses for the reservoir, which is full but not yet delivering water (Scott 2012).

Incorporating protection for aquatic species is a critical element of a good water resource management plan. Impoundments, for example, represent a significant threat to connectivity of Alabama's exceptional aquatic resources, including the many threatened and endangered species of freshwater mussels found in the state.

Therefore, the EPA would like to encourage the State to give priority to maximizing efficiency measures and the possible expansion of existing facilities versus building new reservoirs in order to avoid impacts to aquatic resources such as streams and wetlands, and to protect overall ecological/environmental integrity. My staff would be happy to work with the AWAWG and member agencies to provide technical support of the state's efforts.

As the WMI Report recognizes, water resource management "needs to be holistic across an entire watershed or drainage basin due to the interrelationship of the natural and human processes and activities that can impact each other, in some cases from a great distance. This includes both land and water resources, since land use can have significant impacts on water resources and related ecosystems." A water management plan that incorporates all uses should give equal consideration to instream uses, e.g., aquatic life, aesthetic values, physical stability, and ecological viability (habitat, water quality) as it does to anthropogenic off-stream uses (supply, impoundment), as recognized for some time by western

states and more recently by eastern states and the Instream Flow Council (Breckenridge 2004). The CWA provides that each state must specify appropriate water uses to be achieved and protected for each waterbody (40 CFR 131.10(a)). The state must take into consideration the use and value of water for public water supply, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agriculture, industrial uses and other purposes including navigation. For the past 30 years, North Carolina has successfully utilized the designated use provisions under its water quality standards (WQS) program to work with local jurisdictions to directly address issues where land use affects water use. For instance, a use designation for Class WS-II Waters provides additional protections for drinking water supplies by requiring local jurisdictions to adopt "nonpoint source and stormwater pollution control criteria for the entire watershed" (NCDWQ 2007). Once the use designation is adopted, those provisions are placed into ordinances of local jurisdictions, which are then responsible for their implementation. These provisions also include best practices such as buffers, housing density options or advanced storm water management. The state is careful to point out that these practices do not limit economic development, but rather ensure sustainable development in sensitive areas. *Alabama could review North Carolina's use designations and consider more fully developing its designated uses under the CWA to provide protection for an entire watershed rather than just the waterbody, and require those provisions be adopted by local jurisdictions.*

Expanded Certificates of Use/Permitting:

The EPA strongly supports a comprehensive program for permitting and accounting for both ground water and surface water use in Alabama. Understanding water availability and use is essential to managing the resource (USGS 2012). Understandably, Alabama also would like to keep 'the regulatory burden to a minimum' (WMI Report p.12).

The EPA has three recommendations in this section:

- As other states have faced this challenge, new innovative tools have evolved that Alabama may want to explore. Michigan has developed an innovative and national award winning ground water withdrawal permitting system that provides detailed information on ground water use while keeping the regulatory burden to a minimum. Michigan's Water Withdrawal Assessment Process and Internet Screening Tool was developed collaboratively over six years by the Groundwater Conservation Advisory Council representing water users, state officials, technical experts and conservationists. This tool allows citizens to go on-line, type in information on proposed ground water use, and get instantaneous feedback to determine if the water withdrawal will affect local streams. If it does not, they need only complete forms to get permitted. If it does, they may try to change the location or withdrawal rate to get the "go-ahead." No direct government review is needed for the majority of the permits. Only those few wells that may cause biological effects on streams need to proceed to the more detailed site-specific permit review (Ruswick et al. 2010; Hamilton et al. 2011).

- As Alabama considers how to move ahead with issuing a Certificate of Use (COU) that 'will not interfere with an existing legal use of the water' we ask that you also consider a requirement that

the permitted use not cause or contribute to a violation of water quality standards, including any existing implicit protections for instream flow, such as support for aquatic life.

- In other states, authorities have found it important not to set the threshold too high for capturing withdrawals and impacts via a permitting system. In Massachusetts, for example (Breckenridge 2004), higher permit thresholds led to not capturing data on many withdrawals, compromising understanding of the total anthropogenic uses and impacts on systems, and increasing uncertainty in planning. An effective plan would incorporate estimates of unpermitted uses (e.g., those below the threshold and illegal withdrawals) to more accurately gauge impacts. A plan and permitting system that allows for periodic review and adaptive management will provide for more effective protection as lessons are learned, systems adjust to alterations and impacts, and new monitoring and scientific information becomes available, especially given the variability of hydrographs that is essential to maintenance of the physical/chemical system and aquatic life.

Economic Development

As indicated in Alabama's proposal, protecting the health of freshwater ecosystems is not only critical to biodiversity and ecology but also to the support of a thriving economy. Maintaining the integrity of natural biological and physical systems provides significant economic benefits to state and local economies. In July 2012, EPA Headquarters published a document entitled, *The Economic Benefits of Protecting Healthy Watersheds* (EPA 2012b). This fact sheet, based in part on a study that included data from Alabama entitled, *Forests for Water: Exploring Payments for Watershed Services in the U.S. South* (Hanson 2011) states that healthy intact watersheds provide many ecosystem services that are necessary for our social and economic well-being. These services include water filtration and storage, nutrient cycling, soil formation, flood prevention, food production and timber.

Protection of natural and aquatic resources can also be directly tied to the creation of jobs and a strong economy. For example:

- A 2012 report found that outdoor recreation contributed $646 billion in direct sales and services to the U.S. economy annually, supporting an estimated 6.1 million jobs, generating $39.9 billion in federal tax revenue and $39.7 billion in state/local tax revenue, and providing sustainable growth in rural communities (Outdoor Industry Foundation 2012). Outdoor recreation jobs numbering 215,126 were found in the East South Central states (AL, KY, MS and TN) (Outdoor Recreation Industry 2006).
- Twenty-four million Americans participate in paddling sports (kayaking, canoeing, rafting). Despite the national recession, the outdoor recreation economy grew approximately 5 percent annually between 2005 and 2011 (Outdoor Industry Association 2012).
- Local hydrologic restoration projects are bringing economic development to smaller communities in our region. A project to remove aging dams and restore naturalized white water flow to the Chattahoochee River on the Georgia/Alabama border is projected to bring 144,000 new visitors annually, create 700 jobs and add $42 million additional yearly revenue from recreational tourism (Adams 2011).

- Healthy estuaries, such as the Mobile Bay and coastal communities dependent on the natural timing and delivery of freshwater flows, contribute billions of dollars to state economies.

Protection of adequate instream flow also provides economic certainty to municipal and industrial dischargers. In recent years, there has been a trending downward of freshwater flows in many freshwater rivers and streams – much of which is anthropogenic in origin, such as over-pumping of ground water or surface water withdrawals. Some of these reductions may persist long enough to cause revisions to the calculated 7Q10 (the lowest recorded 7 days of flow in a ten year period). In addition, prolonged droughts have prompted those who control regulated rivers to consider dropping the low flow minimums or revise drought control manuals to allow for further reductions of the low flow values. National Pollutant Discharge Elimination System (NPDES) permits issued under Section 402 of the CWA use critical low flow values such as 7Q10s or negotiated low flows on regulated rivers to calculate a permittee's discharge limits. In areas where those low flow values are causing long-term changes, permits will have to be recalculated to protect for the new critical low flow. Where possible, protection of instream flows from anthropogenic alteration may prevent unnecessary and often costly additional treatment for those permittees.

Whereas resource management can often be portrayed as protection of ecology vs. protection for economic development, new data and studies indicate that they are quite often linked. Therefore, *the EPA encourages the AWAWG to acknowledge as they develop their plan that there may be significant economic benefits, in both ecosystem services, jobs and revenue, to protecting and maintaining intact aquatic ecosystems.*

Surface Water and Ground Water Availability

The EPA supports Alabama's approach of developing comprehensive scientific knowledge of surface water and ground water availability. The EPA recommends that as Alabama explores ground water development policy, it ensure that it addresses the linkages between ground water and surface water. Alabama notes surface water and ground water concerns in this section separately, but they should be treated in most areas as a single resource. Nearly all surface water bodies interact in some manner with ground water (Winter 1998). Withdrawal of surface water can deplete ground water and there are numerous areas in the Southeast where pumping of ground water has been known to directly affect surface water. Ground water depletion may cause significant reductions of surface water flow which may impair or remove designated uses without going through the provisions of the CWA (40 CFR 131.10 (g)). It should be noted that under the CWA, existing uses generally cannot be removed (40 CFR 131.10(h)).

The EPA recommends that newly developed ground water withdrawal policy directly link to Alabama's water quality standards so that any withdrawals will not cause or contribute to a loss of the water quantity needed to support the water quality, including support for meeting aquatic life uses, drinking water, recreation, etc.

The EPA will work with the State to explore any potential assistance that we can provide on funding options for maintenance of gaging stations, water quality and biological assessments and ground water and surface water assessments.

Water Conservation and Reuse

When it comes to protecting our limited fresh water supply, development and expansion of efficiency and conservation programs and efforts is an essential first step as we noted above, and we applaud the recognition in the *WMI Report* of the major impacts of water usage, and benefits of water conservation and reuse. Conservation not only reduces volumes requiring treatment (for consumption and as waste), but also reduces energy required to distribute and treat water. Conservation also preserves in-stream values such as water quality, habitat, physical stability, and aquatic life.

Water reuse, as recognized in the *Water Conservation and Water Reuse* section of the report, can be implemented in many settings. It can benefit municipal, agricultural, environmental, industrial, and private entities through uses such as those identified as well as through protection of environmental values. It can also represent an economic development advantage by reducing infrastructure and energy costs and resource demands in both public and private capacities. In September, EPA released its 2012 update of its manual *Guidelines for Water Reuse ("2012 Guidelines")*. This update includes new information on efforts by states across the country to develop water reuse, including regulations adopted by 30 states and one territory, and an inventory of diverse case studies (EPA 2012a). It can serve as a valuable resource and addresses two issue areas identified as considerations in the WMI Report. The first consideration given is:

- A tension exists within public water systems between the need to conserve water and a financial model predominantly based on water sales.

When water is reused as one measure for avoiding new withdrawals, this conflict is reduced; Chapter 7 of the *2012 Guidelines* addresses financial aspects of water reuse, including rate and fee structures. Other considerations describe success of these approaches as tied to public understanding and acceptance, for example:

- The public's perception of water reuse may be less receptive if they believe the recycled water is from a common public waste source.

This is a challenge that has played out nationally and in many communities as water reuse has been implemented, and Chapter 8 of the *2012 Guidelines* provides an excellent discussion of the issue and various approaches to public outreach and engagement. Much of this discussion, including the importance of proactively providing information to the public, is also translatable to conservation and efficiency programs.

An excellent example of a successful water reuse initiative is the Mobile Area Water and Sewer Systems (MAWSS) demonstration project funded by EPA through a $1.1 million National Community Decentralized Wastewater Demonstration Project grant. To deal with municipal treatment capacity overloads, the utility diverted wastewater to four satellite cluster facilities. Some of that diverted water is

then treated and used in a state-of-the-art underground drip irrigation system for a municipal park, decreasing the burden on the central treatment facility and reducing wastewater discharges to Mobile Bay (MAWSS 2005).

We have provided each of the southeastern states with a copy of EPA Region 4's 2010 *Guidelines on Water Efficiency Measures for Water Supply Projects in the Southeast* ("*WEGs*"). The *WEGs* emphasize many of the same goals expressed in the Alabama WMI report, and provide recommendations for effective implementation of conservation and efficiency measures (EPA 2010b). EPA is continually working to update these guidelines to incorporate more refined and quantifiable approaches and will continue to provide those as revised. The WMI Report issue area on conservation mentions measures such as fixing leaks, turning off water when not in use, rain barrel use, and non-potable water reuse in agricultural and industrial settings. We would highly recommend implementation of much more comprehensive measures (such as those identified in the *WEGs) and incentivizing them via funding programs and permitting requirements*. We especially endorse fixing leaking infrastructure, using an integrated resource management approach across residential, industrial, agricultural, and commercial settings, full-cost pricing, conservation pricing, metering of all water users, low-impact development and green infrastructure, retrofitting all buildings, water reuse, landscaping to minimize demand and waste, and efficient irrigation practices. Many state approaches can provide good examples of conservation and efficiency programs, such as the standards and recommendations in ten key areas in Massachusetts' *Water Conservation Standards* of 2006.

These approaches can conserve resources, reduce treatment costs, and reduce releases of pollutants into streams and rivers, as well as reduce unbilled losses. Conservation and efficiency measures can be promoted directly with residential, industrial, agriculture, commercial, municipal and local users, as well, not just public utilities, through establishment of codes, policies, and incentive programs, as demonstrated by many successful programs across the country. As recognized in the WMI report, developing a new water supply can be costly and time consuming, whereas demand can often be met for a fraction of the cost via conservation and efficiency measure implementation. Ashland, Oregon, for example, was facing a demand-supply gap and initially considered an $11 million reservoir or $7.7 million for 13 miles of new pipeline to withdraw from the Rogue River (EPA 2002). Instead they implemented an efficiency program comprised of system leak detection and repair, conservation-based water rates, a high-efficiency showerhead replacement program, and toilet retrofits and replacement. The cost of the program was just $825,875—less than 10% of the estimated cost of a reservoir—and less than a decade later demand was down considerably (16% of winter use), wastewater flow was reduced by 58 million gallons annually, and the town had realized considerable energy savings primarily associated with efficient showerhead replacement. Savings to utilities from avoiding additional infrastructure development can also be considerable. The WMI Report refers to the potential use of the Water Supply Assistance Fund; this presents an opportunity whereby efficiency-first guidelines could be established as part of this program. Additionally, the Regulated Riparian Model Water Code bolsters this emphasis by specifying a water authority's ability to "promulgate and establish guidelines and procedures relating to loans or grants" (ASCE 2004).

Again, EPA recommends that the state place up-front emphasis on conservation and efficiency as integral to water resource management. We highly recommend that the measures implemented be a far more comprehensive approach than that identified in the WMI Report, and that they be incentivized

through funding programs and permitting requirements. States such as Florida, Kansas, Colorado, Pennsylvania, Vermont, and Nebraska have used State Revolving Fund (SRF) programs to provide audit and leak detection programs, metering, and to improve efficiency in irrigation (EPA 2003). Kansas and Texas require implementation of approved water efficiency plans in order to receive SRF funding.

EPA welcomes the opportunity to work with Alabama to explore potential funding options to support Alabama's efforts to implement water efficiency measures and conservation and reuse programs. Nationally, the EPA already provides funding for efficiency, including reuse, through mechanisms such as the State Revolving Fund.

Interbasin Transfers

The EPA recommends that Alabama consider the procedures set out in Massachusetts' Interbasin Transfer Act (MGL Ch 21 Section 8B-8D), which governs water and wastewater transfers between river basins of the Commonwealth. This Act has been in effect for over 25 years and is considered part of an overall plan which has led Massachusetts to be considered a model for water supply efficiency. (See http://www.mass.gov/dcr/watersupply/intbasin/index.htm.) This well–established program includes many features that Alabama is considering, including defined basin units for evaluating and accounting for interbasin transfers and a "regulatory mechanism that provides for existing transfers and establishes criteria for new or expanded transfers." The Act also requires that efficiency measures be in place prior to approval of a transfer, such as conservation, leak detection, more accurate metering, etc. These efficiency measures correlate well with Alabama's stated goals regarding conservation.

Instream Flows

Under the WMI Report's Findings and Policy Options (pp.4-7) it recommends that the state:

- *Develop a policy concerning instream flows which can serve as a cornerstone of a statewide water management plan, and*
- *Develop an acceptable legal and regulatory framework for implementation of an instream flow policy.*

Under the issues identified by the Permanent Joint Legislative Committee on Water Policy and Management (2009) it recommended:

- *Examining and recommending appropriate flow dynamics [instream flows] for rivers and streams to support biological, recreational, and industrial/transportation needs and requirements.*

EPA concurs with these statements and recommends that Alabama utilize the well understood and well established tools under the CWA to develop instream flow water quality standards (WQS) for the protection of all designated uses and for application in all other purposes under the CWA. Under the CWA, WQS include the designated use of a waterbody, narrative and/or numeric criteria to protect those designated uses and the state's antidegradation requirements. All three of these WQS components can be used by Alabama as relevant and vital tools to protect and restore healthy hydrology in the state.

The WMI Report to the Governor states that "environmental legislation such as the Clean Water Act...often play[s] a major role in protecting instream flows in rivers and stream reaches but in a very indirect manner..." (WMI Report, p. 26). However, the EPA notes that the tools available under the CWA are increasingly being used to protect and restore the hydrology of waterbodies.

Many states have considered that the CWA is only concerned with water *quality* and does not regulate water *quantity*. However, the U.S. Supreme Court specifically addressed this under the CWA in PUD No. 1 of Jefferson County v. Washington Department of Ecology ("PUD"), 511 U.S. 700 (1994). In that case, the Court found that the distinction between water quality and quantity was "an artificial distinction" and that "[i]n many cases, water quantity is closely related to water quality..." (*PUD* at 1912-13). The linkage between water quality and water quantity has been well documented by the scientific community. Bunn and Arthington (2002) concluded that flow is a major determinant of physical habitat in streams and rivers and directly affects biological composition. Modifying flow regimes alters habitat and influences species diversity, distribution and abundance (Bunn and Arthington, 2002). Aquatic plant and animal species have evolved life cycle patterns directly tied to the frequency, magnitude, duration, timing and rate of change of natural flows. Ecologists now understand that flows following the range of the natural hydrograph are important for maintaining structure and function of aquatic ecosystems (Freeman and Marcinek, 2006). The *Regulated Riparian Model Water Code* recognizes the critical interconnectedness of water quantity and water quality at Section 1R-1-09, stating:

> Water allocation is inseparable from the regulation of water quality. Regardless of whether both functions are vested in a single agency, water allocation must be coordinated with water quality for effective management of a water source and to comply with federal laws and regulations. ... Two programs...will particularly affect State water allocation: 1. ambient water quality standards; and 2. effluent discharge standards for "point sources."

At this time, eight states and three tribes have adopted explicit narrative water quality criteria for protection of instream flows into their state WQSs under the CWA. Many more states are in the process of developing hydrologic standards under the CWA. Table 1 provides examples of how narrative criteria have been developed to protect not just the ecological conditions necessary to protect vital fisheries and aquatic life, but also recreation and all other designated uses under the CWA.

State/Tribe	Terms in WQS
NH	"surface water quantity shall be maintained at levels adequate to protect existing and designated uses"
RI	"quantity for protection of... fish and wildlife...adequate to protect designated uses" "For activities that will likely cause or contribute to flow alterations, streamflow conditions must be adequate to support existing and designated uses."
VT	Class A(1)- Changes from natural flow regime shall not cause the natural flow regime to be diminished, in aggregate, by more than 5% 7Q10 at any time; Class B WMT 1 Waters - Changes from the natural flow regime, in aggregate,

State/Tribe	Terms in WQS
	shall not result in natural flows being diminished by more than a minimal amount provided that all uses are fully supported; and when flows are equal to or less than 7Q10, by not more than 5% of 7Q10. Class A(2) Waters and Class B Waters other than WMT1 - Any change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria.
NY	For both Class N fresh surface waters and Class AA(S) fresh surface waters … "There shall be no alteration to flow that will impair the waters for their best usages."
VA	"Man-made alterations in stream flow shall not contravene designated uses including protection of the propagation and growth of aquatic life."
KY	"Aquatic Life. (1) Warm water aquatic habitat. The following parameters and associated criteria shall apply for the protection of productive warm water aquatic communities, fowl, animal wildlife, arboreous growth, agricultural, and industrial uses:...(c) Flow shall not be altered to a degree which will adversely affect the aquatic community."
TN	Criteria for Water Uses "(3) Fish and Aquatic Life (n) Habitat- The quality of stream habitat shall provide for the development of a diverse aquatic community that meets regionally-based biological integrity goals. Types of habitat loss include, but are not limited to: channel and substrate alterations… stream flow changes…. For wadeable streams, the instream habitat within each subecoregion shall be generally similar to that found at reference streams. However, streams shall not be assessed as impacted by habitat loss if it has been demonstrated that the biological integrity goal has been met. (o) Flow- Stream or other waterbody flows shall support the fish and aquatic life criteria." "(4) Recreational. (m) Flow- Stream flows shall support recreational uses."
MO	"Waters shall be free from physical, chemical, or hydrologic changes that would impair the natural biological community."
Seminole Tribe of FL	"Class 2-A waters shall be free from activities...that …Impair the biological community as it naturally occurs… due to …hydrologic changes"
Mole Lake Band of the Lake Superior Tribe of Chippewa Indians	"prohibited…human induced changes to … area hydrology that alter natural ambient conditions…such as…flow, stage…. Natural daily fluctuations of flow, stage… shall be maintained."
Bad River Band of the Lake Superior Tribe of Chippewa Indians	"Water quantity and quality that may limit the growth and propagation of, or otherwise cause or contribute to an adverse effect to wild rice, wildlife, and other flora and fauna of cultural importance to the Tribe shall be prohibited." "Natural hydrological conditions supportive of the natural biological community, including all flora and fauna, and physical characteristics naturally present in the waterbody shall be protected to prevent any adverse effects." "Pollutants or human-induced changes to waters, the sediments of waters, or area hydrology that results in changes to the natural biological communities

State/Tribe	Terms in WQS
	and wildlife habitat shall be prohibited. The migration of fish and other aquatic biota normally present shall not be hindered. Natural daily and seasonal fluctuations of flow (including naturally occurring seiche), level, stage, dissolved oxygen, pH, and temperature shall be maintained."

Table 1: Narrative language in WQS of select states and tribes relating to hydrologic criteria. See EPA website for full text of specific criteria: http://water.epa.gov/scitech/swguidance/standards/wqslibrary/index.cfm)

It should be noted that some other states have set instream flow standards that are implemented through provisions other than the state WQSs. Should Alabama choose to develop instream flow standards outside of the CWA, it should ensure that those instream flow standards are consistent with the state WQSs. That is, Alabama should not set conditions which would be less stringent than or in conflict with the state WQSs under the CWA. The EPA recommends setting the instream flow standard through existing CWA provisions in order to avoid that confusion. Specifically, EPA suggests that Alabama develop instream flow water quality criteria into the state WQSs (Chapter 335-6-10). Once approved, those standards would be in use for all purposes under the CWA in Alabama, such as Section 401, Section 404, etc.

The WMI Report states that the use of the public trust doctrine to protect instream flows often does not take into account the inter- and intra-annual flow variability needed to support stream ecology (p. 26). That is true of many state water policies or specific 'negotiated instream flow requirements' for regulated rivers that have historically focused on protecting a minimum or base flow. As Alabama succinctly captures, there is now a better understanding of the importance of addressing the seasonal, intra-annual and inter-annual variable flow patterns needed to maintain or restore processes that sustain natural riverine characteristics (Instream Flow Council 2009). The EPA concurs with Alabama and supports the approach that does not focus solely on the necessary minimum flows. While a low flow value such as the 7Q10 has been used as a critical flow value for developing waste load allocations for industrial and municipal dischargers, it was never intended as a value to protect ecological integrity.

The EPA Region 4 encourages states to consider adopting environmental flow standards under the CWA based on a "natural flow paradigm" that more closely resembles natural conditions (Poff et al. 1997). Where resources are available, site-specific environmental flow determinations can be made. When such studies are not practicable, the use of tools such as the "Ecological Limits of Hydrologic Alteration" (ELOHA; Poff et al. 2010) could be used which provides a scientifically sound means to assess environmental flows across large regions. Other natural flow approaches can be used where site-specific data are not available, such as using a Percent-of-Flow (POF) approach. The POF approach "explicitly recognizes the importance of natural flow variability and sets protection standards by using allowable departures from natural conditions, expressed as percentage alteration" (Richter et al. 2012). The POF approach is relatively simple to implement and may provide a high degree of protection for designated uses that are dependent on natural flow variability. Region 4 notes that the POF approach may need to be modified to be more protective for certain categories of highly sensitive or ecologically significant water bodies. This could include waters designated as Outstanding Alabama Waters or Outstanding National Resource Waters or waterbodies that have a significant contribution of base flow from ground water. The concept of supporting a "natural flow paradigm" as an important ecological objective fits in

naturally with the structure of CWA WQS as it can be explicitly stated as a narrative or numeric criterion with frequency, duration and magnitude, utilized to protect designated uses and evaluated during antidegradation reviews.

Development of an instream flow WQS under the CWA would address many of the concerns stated in the Instream Flows section of the WMI Report (pgs. 26-27), including the following:

- *Consistency with fulfilling the trustee resource conservation requirements for the Alabama Department of Conservation and Natural Resources regarding wildlife (Code of Alabama, 1975, §9-2-2).*
- *Relieving concerns regarding 'complex and cumbersome' implementation and enforcement and multi-agency coordination. Use of WQSs under the CWA is an established and well understood process. Other agencies could rely on the standards as the metric to be used in other state programs.*
- *Providing clear definition of the needed natural, variable instream flows versus static minimum flows which do not afford adequate protection.*

Interstate Coordination

EPA would welcome the opportunity to participate in any way with other state and federal agencies to facilitate coordination of interstate issues. EPA has access to facilitation services that could be utilized as needed for resolution of interstate issues.

As well, we encourage all states to keep in mind the CWA provision to protect all downstream uses, including the hydrologic conditions needed to meet the designated uses (40 CFR 131.10(b)) of downstream states.

Water Resources Data

EPA welcomes the opportunity to work with Alabama and other federal partners to explore potential funding options in Alabama's efforts to acquire quality surface water and ground water data.

The EPA also notes that there is a wealth of data and research that is already being developed in the area of water management, water efficiency, the flow-ecology relationship and ground water/surface water interactions that can be used by the state to supplement its own data and research, including work being done by the Southern Instream Flow Network, the USGS, the US Fish and Wildlife Service and academic researchers. Research that is taking place in neighboring states may also be of use to Alabama in those areas with similar physical and geological formations.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

OFFICE OF THE
REGIONAL ADMINISTRATOR

June 25, 1996

Timothy R.E. Keeney
Director
Department of Environmental Management
9 Hayes Street
Providence, RI 02908

Dear Director Keeney:

As you know, governments at the federal, state, and local levels, along with the private sector, have expended enormous efforts to reduce the discharge of pollution to our surface waters. This investment has yielded great improvements in water quality over the past two decades.

But these improvements are threatened by a growing problem: the ever-increasing diversion of water for hydropower generation, industrial and commercial use, agriculture, snowmaking, and municipal water supply. Whatever the end use, the result of unchecked water withdrawals can be a dangerous reduction in flows in rivers and streams and severe reductions in lake levels.

The effects of flow reductions can include disruption of fish passage, reduced protective cover, increased accesibility to predation, increased stream temperatures, and reduced spawning habitat. In addition, these effects can exacerbate the effects of chemical stressors. Reduced seasonal variations in stream flows can increase the potential that aquatic organisms will be exposed to toxic concentrations of chemicals from wastewater discharges. Artificially reduced flows have interfered with recreational uses, the restoration of historic salmon runs, and the cultural heritage of Native Americans.

We all have a responsibility to tackle the flow problem. This will become even more important as we accelerate our move toward a "watershed" approach to environmental protection--water withdrawals are a key factor in the health of a watershed.

A critical first step is to ensure that reasonable conservation measures are implemented in places where flow levels have become a concern. Last summer, the Ipswich River in Massachusetts literally ran dry--and yet some municipal water suppliers (who draw their water from wells in the Ipswich River watershed, directly contributing to lower water levels) had imposed no

conservation requirements at all. In other areas, significant stretches of riverbed are essentially dry due to the diversion of flow through pipelines to power plants. The unlimited use of water in a time of shortage is a luxury that our environment cannot afford.

Below, I have described some existing mechanisms to encourage conservation and prevent excessive water withdrawals. I believe that these mechanisms have been underused in the past. We must make more active use of these approaches.

In addition to these existing mechanisms, additional programs may be needed to protect water levels. At the end of this letter I have included some suggestions in that direction.

Existing authority to prevent excessive water withdrawals

1. Water Quality Standards. Water quality standards for each water body include two elements: the designated uses of that water body, and specific criteria designed to protect those uses. While attention is often focused on the criteria, the designated uses are of equal importance--and in many circumstances provide authority for states to regulate water withdrawals.

For example, the Supreme Court has ruled that states may deny certification pursuant to Section 401 of the Clean Water Act to a project which will interfere with a designated use set forth in the state's water quality standards--even if specific criteria will not be violated. PUD No. 1 of Jefferson County v. Washington Department of Ecology, 114 S.Ct. 1900 (1994). Section 401 certification is required whenever a federal permit or license is needed for a project involving a discharge to waters of the United States.

The PUD case concerned a proposed hydroelectric power plant, which required a license from the Federal Energy Regulatory Commission. The Court held that the State of Washington was entitled to require the plant to maintain certain stream flows as a condition of Section 401 certification. The Court noted that the distinction between water "quality" and water "quantity" is "artificial"--

> In many cases, water quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses...

Id. at 1912-13.

I suggest that states use their water quality standards, in combination with the § 401 certification process or state laws which implement such standards, to prevent activities which will reduce stream flows to unacceptable levels. At a minimum, this approach could be used to require appropriate conservation measures. Moreover, as discussed below, I recommend that states consider increasing the effectiveness of water quality standards by incorporating numeric flow

criteria.

2. **Antidegradation.** EPA regulations require that state water quality standards include an antidegradation program that ensures the protection of existing beneficial uses.

In order to protect such uses, an antidegradation program must obviously address water withdrawals as well as discharges. Each state should review its antidegradation program to ensure that there is adequate ability to protect existing uses.

3. **§ 404 permits.** The construction of new water withdrawal systems (or the maintenance of existing systems) may require § 404 permits. Those permits are subject to the § 401 certification process, which (as discussed above) provides a mechanism for states to protect flow levels.

4. **NPDES permits.** Some water withdrawals are linked to downstream discharges. For example, a municipality may withdraw drinking water from a river at one point and then discharge wastewater downstream of that point.

In permitting the wastewater discharge, the permitting authority should consider whether the water withdrawal by the municipality will reduce flow to the point where the discharge will cause exceedances of water quality standards. If so, the permitting authority should consider requiring conservation measures to ensure that stream flow is adequate to accomodate the discharge without exceeding standards.

5. **Endangered Species Act and state endangered species statutes**. If a river or stream provides habitat or potential habitat for endangered or threatened species, the federal Endangered Species Act or analogous state statutes may provide authority to restrict withdrawals or require conservation activities. This possibility should be considered in permitting and other decisions.

6. **Public Trust doctrine.** In some states the "public trust" doctrine may provide legal authority for the protection of water levels in rivers, lakes, and streams.

Additional programs to protect water levels

1. **Permitting withdrawals**. Those states which do not already have a system for permitting water withdrawals might consider creating one. Such a system does not have to be bureaucratically onerous or needlessly restrictive--the goal is to allow targeted efforts to conserve water and, if necessary, limit withdrawals in areas where low flows cause real environmental problems.

2. **Make water quality standards more explicitly protective of flows.** As discussed above, water quality standards already include designated uses, which can be applied to protect flow levels. Such protection could be enhanced, however, by including specific flow requirements in the standards.

For example, if a stream segment is designated as habitat for aquatic life, the standards might specify a flow level necessary to support such habitat. At the start, this might be done in a few segments with identified flow problems. The existence of such flow standards would support a state's efforts to impose conservation requirements through the § 401 certification process or other mechanisms.[1]

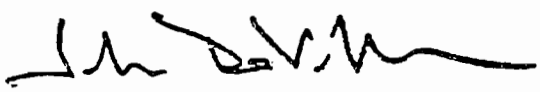
3. **Add biological criteria to water quality standards.** Water quality standards in many of the states have general biological criteria, in narrative form: for example, "high quality habitat," or "cold water fishery." These criteria provide a basis for the protection of habitat, but they are vague and subject to prolonged debate.

Maine has specific descriptive narrative criteria for its various classes of water. These criteria help to clarify habitat requirements and narrow the debate. We suggest that the states adopt at least class-specific narrative biological criteria, and preferably class-specific numeric measures of biological integrity.

I look forward to working with you on these issues. We will organize a meeting of appropriate staff to discuss how these approaches can be implemented in practice. We plan to hold such a meeting by the end of the summer.

Please feel free to call me or Ken Moraff at (617)/565-3741, with any comments, questions, or concerns. Thank you for your attention to this issue.

Sincerely,



John P. DeVillars
Regional Administrator

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1. Fishery management/restoration plans can also be integrated into water quality standards. For example, anadromous fish goals of state/federal restoration plans for the Connecticut, Merrimack, or Penobscot Rivers can be integrated into the respective state standards.