April 5th Water Conference
Participant List

Question 1: Water Supply and Resource Management Coordination

Is there a need for improved coordination of water supply activities and water resources management at the local, state and/or national levels, and if so, what form should this coordination take and how should it function? What has been the experience with regional, river basin and watershed-based planning efforts and conflict resolution? What lessons can be learned from these and other models for water supply coordination and water resources management? What role should the federal government play in this area?

Participants:

- Metropolitan Water District of Southern California
- State of Colorado Department of Natural Resources
- Carlsbad Irrigation District
- Trout Unlimited
- American Rivers
- Charles T. DuMars
- Idaho Department of Water Resources/Idaho Water Resources Research Institute

Senate Energy and Natural Resources Committee
Water Conference

Metropolitan Water District of Southern California

1. Water Supply and Resource Management Coordination

Is there a need for improved coordination of water supply activities and water resources management at the local, state and/or national levels, and if so, what form should this coordination take and how should it function? What has been the experience with regional, River basin and watershed-based planning efforts and conflict resolution? What lessons can be learned from these and other models for water supply coordination and water resources management? What role should the federal government play in this area?

Several models exist that demonstrate coordination of water supply activities and water resources management at the local, state and/or national levels.

For example, Metropolitan's service area composes of 18 million people in parts of six southern Californians counties who rely on reliable, high quality water supplies for their quality of life and the health of over $700 billion regional economy. The region's resource strategy is based on the Southern California Integrated Water Resources Plan, an example of how regional coordination can work. The IRP has been tested and proven successful. The effectiveness of the IRP has been proven in recent years by the severe drought in the Colorado River watershed. Metropolitan's supply from the Colorado River Aqueduct has been reduced by 40% in 2003 and 2004. The region continues to enjoy reliable, high quality water supply because of the investments made under the IRP.

First adopted in 1996 and updated in 2003, the IRP is both a planning framework and the blueprint for resource program implementation. It is formulated with input from water agencies throughout southern California, environmental interests and the public, with six objectives:

- Reliability;
- Affordability;
- Water quality;
- Diversity;
- Flexibility; and
- Recognition of environmental and institutional constraints.

The implementation of IRP relies on partnership of federal, state, regional and local agencies and water suppliers, with diversification a hallmark: the resource plan includes water conservation, water recycling, groundwater production, brackish groundwater recovery, ground and surface storage, supplies from the State Water Project and Colorado River, agriculture to urban transfers, water supply options to provide the needed year to year water supply assurances, drought and surplus water management, and ocean desalination, which is the newest addition to the resource portfolio. Operational flexibility and storage are two necessary additional features to make supply diversity most effective.

The benefits are myriad:

- The IRP has allowed the region to handle uncertainties, including climate change, inherent in any planning process. For the water industry, some of these uncertainties are the level of population and economy growth, which directly drive water demands; water quality regulations and new chemicals found to be unhealthful; endangered species affecting sources of supplies; and periodic and new changes in climate and hydrology.
- The diversified water portfolio allows the region to minimize uncertainties and risks associated with an individual resource; provides flexibility in handling drought periods, and adapts to changing regulatory and environmental conditions.
- For example, the regions' diversified storage portfolio allows Metropolitan to participate in the demand shift portion of a CALFED Environmental Water Account to reduce imported water demands from the State Water Project when endangered and threatened species are moving through the Bay-Delta water system.

The most significant state-federal collaboration on water issues is the <u>CALFED Bay-Delta Program,</u> a collaborative effort among 23 state and federal agencies to improve water supplies in California and the ecosystem health of the San Francisco Bay-Sacramento-San Joaquin River Delta watershed.

The primary objectives of the Program include:

- **Improve ecosystem quality of the Bay-Delta watershed;**
- **Reduces water supply conflict and improve benefits to uses of Bay-Delta water system;**
- **Provide good water quality for all beneficial uses; and**
- **Reduce risk to vulnerability of Delta functions.**

The Program is coordinated through the California Bay-Delta Authority (CBDA), which is a state organization with federal participation. The CBDA obtains stakeholder input through a Public Advisory Committee.

"The fundamental premise of the Program is that the agencies can best meet their individual responsibilities by sharing information and cooperating with each other. The CALFED Program or the CBDA exercises no authority over the agencies. The program relies on the continuous cooperation of each participating agency, exercising its own legal authority."

Senate Energy and Natural Resources Committee
Water Conference

State of Colorado Department of Natural Resources

Topic #1 Water Supply and Resource Management Coordination

The State of Colorado's Role in Water Supply and Resource Management

Colorado has a great tradition of being a leader among the western states in managing and administering its limited water resources and in addressing and solving its water resources challenges and pursuing management alternatives in innovative and effective ways. The Colorado Water Conservation Board (CWCB) is part of the State of Colorado's Department of Natural Resources (DNR), which administers programs related to the state's water, forests, parks, wildlife, minerals, and energy resources.

CWCB plays a critical role in establishing water policy in Colorado. The CWCB Board formulates policy with respect to water development programs. The Board assists in the administration of interstate compacts on the Arkansas and Colorado Rivers; administers flood plain programs, water project construction funds, and the Office of Water Conservation and Drought Planning; and participates in endangered species programs. It also acquires and manages all instream flow rights for the state.

The Statewide Water Supply Initiative (SWSI)

With the approval of the 2003 Colorado General Assembly, the CWCB, commissioned the Statewide Water Supply Initiative (SWSI), an 18-month study to explore, basin by basin, existing water supplies and existing and projected demands through the year 2030, as well as a range of potential options to meet that demand. SWSI is the most far-reaching and comprehensive effort ever undertaken to understand Colorado's water supplies as well as the state's existing and future water demands. As a result of this study, we know more today about Colorado's current and future water use than we have ever known before. This information will help local communities and water providers as they work to plan, manage, and efficiently use Colorado's surface and groundwater resources. The SWSI report can be downloaded at http://www.cwcb.state.co.us/SWSI/Table_of_Contents.htm

<u>Ground Rules</u>

In order to achieve broad support and acceptance by various water interests and stakeholders, the SWSI process established ground rules. Ground rules included:

- Local authority and control: Providing water for municipal and agricultural users is the purview of local water providers. Consequently, it was important that SWSI not take the place of local water planning.
- Bottom-up, not top-down: Providers, stakeholders, and communities across Colorado were asked to identify their unique concerns, needs, and issues.
- All solutions explored: All solutions, including conservation, rehabilitation of existing water supply facilities, enlargement, and/or more efficient use of existing water supply facilities, as well as new water supply projects, have been and must continue to be considered.
- Adherence to Colorado's Doctrine of Prior Appropriation: The baseline requirement for any water supply or water management solution is that it must be accomplished

within the statutory framework of Colorado's existing water rights and water administration system, incorporating Colorado's Doctrine of Prior Appropriation.

Stakeholder and Public Involvement

In addition to the establishment of ground rules, a stakeholder and public involvement process was implemented. This process was designed to provide a mechanism and forum for the CWCB Board to solicit and exchange information, and was essential to the success of the project. Basin roundtables were established in each of the eight major river basins in the state. The Basin Roundtables, with the support of and input from the CWCB Board, defined the overall water management objectives, established performance measures to meet these objectives, and identified solutions for meeting future water needs. Information exchange occurred at the following levels:

Basin Roundtables – where local interests met to exchange ideas, review and present water supply and demand data, summarize planning initiatives, and help guide the development of water supply and demand objectives and strategies for achieving the objectives. This was a consensus building process to address specific issues within each river basin. A portion of each meeting was also devoted to obtaining information and comment from the public.

Roundtable participants in each basin included representatives of:

- Agricultural and ranching community
- Business, development, and civic organizations
- Environmental interests
- Federal agencies (e.g., U.S. Forest Service, U.S. Bureau of Reclamation)
- Local Governments not directly providing water (municipal, county, and regional)
- Municipal water providers
- Recreational interests
- Water Conservancy/Conservation Districts
- CWCB Board Member(s) for the basin
- Technical support was provided by: the State Engineer's Office, Division of Wildlife, State Parks, and select federal agencies

General Public Outreach – intended to provide a forum specifically for presenting information to and obtaining feedback from the general public. The pubic was kept informed of the progress of the study, and invited to provide public input and feedback, through a variety of activities.

Major Findings of SWSI

SWSI explored major aspects of Colorado's water use and development on both a statewide and an individual basin basis. Major findings are based on technical analyses and feedback gathered through Basin Roundtable input. Even though some of these

findings are readily apparent to some, it was important that they be affirmed as part of building a foundation and common understanding. Other findings were determined and/or clarified through the SWSI process. These findings are summarized below.

1. Significant increases in Colorado's population – together with agricultural water needs and an increased focus on recreational and environmental uses – will intensify competition for water.

2. Projects and water management planning processes that local M&I providers are implementing or planning to implement have the ability to meet about 80 percent of Colorado's M&I water needs through 2030.

3. To the extent that these identified M&I projects and processes are not successfully implemented, Colorado will see a significantly greater reduction in irrigated agricultural lands as M&I water providers seek additional permanent transfers of agricultural water rights to provide for the demands that would otherwise have been met by specific projects and processes.

4. Supplies are not necessarily where demands are; localized shortages exist, especially in headwater areas, and compact entitlements in some basins are not fully utilized.

5. Increased reliance on nonrenewable, nontributary groundwater for permanent water supply brings serious reliability and sustainability concerns in some areas, particularly along the Front Range.

6. In-basin solutions can help resolve the remaining 20 percent gap between M&I supply and demand, but there will be tradeoffs and impacts on other uses – especially agriculture and the environment.

7. Water conservation (beyond Level 1) will be relied upon as a major tool for meeting future M&I demands, but conservation alone cannot meet all of Colorado's future M&I needs. Significant water conservation has already occurred in many areas.

8. Environmental and recreational uses of water are expected to increase with population growth. These uses help support Colorado's tourism industry, provide recreational and environmental benefits for our citizens, and are an important industry in many parts of the state. Without a mechanism to fund environmental and recreational enhancement beyond the project mitigation measures required by law, conflicts among M&I, agricultural, recreational, and environmental users could intensify.

9. The ability of smaller, rural water providers and agricultural water users to adequately address their existing and future water needs is significantly affected by their financial capabilities.

10. While SWSI evaluated water needs and solutions through 2030, very few M&I water providers have identified supplies beyond 2030. Beyond 2030, growing demands may require more aggressive solutions.

Key Recommendations

Following from SWSI's major findings, and based primarily on feedback obtained from the CWCB Board, Basin Roundtables, and public input, the recommendations outlined below provide guidance on how Colorado should proceed in addressing its future water needs. Interested parties are encouraged to look at the Key Recommendations section of the Executive Summary, which expands on these key recommendations.

1. Ongoing Dialogue Among all Water Interests is Needed
2. Track and Support the Identified Projects and Processes
3. Develop a Program to Evaluate, Quantify, and Prioritize Environmental and Recreational Water Enhancement Goals
4. Work Toward Consensus Recommendations on Funding Mechanisms for Environmental and Recreational Enhancements
5. Create a Common Understanding of Future Water Supplies
6. Develop Implementation Plans Toward Meeting Future Needs
7. Assess Potential New State Roles in Implementing Solutions
8. Develop Requirements for Standardized Annual M&I Water Use Data Reporting

The CWCB adopted two mission statements regarding meeting future water needs. The first mission statement addresses supporting the identified projects and processes that are designed to meet 80% of the 2030 municipal and industrial water needs:

> *Following the lead of local water suppliers, the state will monitor long-term water needs, provide technical and financial assistance to put the necessary plans, projects and programs in place to meet those needs, and foster cooperation to avoid being forced to make trade-offs that would otherwise harm Colorado's environment, lifestyle, culture, and economy.*

The second mission statement addresses the 20% municipal and industrial gap and the agricultural shortages and the environmental and recreational needs:

> *Foster cooperation among water suppliers and citizens in every water basin to examine and implement options to fill the gap between ongoing water planning and future water needs.*

The CWCB and the State of Colorado General Assembly have recognized the need for an ongoing dialogue among all interests and that the SWSI is a dynamic process. The General Assembly is currently evaluating continuing funding for the SWSI process as well as expanding the dialogue to discuss inter-basin issues within the major river basins in Colorado. The precise timing and method in which these recommendations can be implemented is flexible, and more discussion of ideas and suggestions will be discussed as the process moves forward.

Potential Federal Role in Water Supply and Resource Management

The key findings and recommendations from SWSI identify critical needs for funding at the state and federal level. The costs to implement water supply and water resources projects continue to escalate. In light of the significant investments that must often be made to meet the needs of water users, numerous federal and state agencies have developed programs for partnering with project sponsors. Some agencies, such as the BOR, had their genesis in the immense need to support water management solutions in working with local project sponsors. Many of today's water resources programs include the ability to provide funding to support water supply and water resources projects, through grants, loans, or related mechanisms.

In addition to the potential federal roles identified above there are two other areas where a federal role would be beneficial in meeting future water needs:

Streamlining of Regulatory and Permitting Processes

Permitting was identified as one of the primary implementation hurdles for water supply projects, and has the greatest impact on the uncertainty associated with the Identified Projects and Processes. Many water providers and agricultural users believe that one of the most significant hurdles to reliable water delivery in Colorado is environmental permitting. Federal permitting triggered by authorizations, funding, rights-of-way, licenses, the Endangered Species Act or Section 404 of the CWA can entangle projects for years and cost millions in delays, consultants, and attorneys. Existing water projects and water rights are also subject to permitting issues.

Alternative Funding for Environmental and Recreational Enhancements

Environmental and recreational interests and local governmental agencies view the federal, state, and local permit process as vital to protecting the environment, recreational opportunities, and the local economy. These regulatory processes are viewed as the only way that these interest groups can have meaningful input to ensure that the local interests and the environment and recreational opportunities are protected. The development of alternative means to provide for environmental and recreational enhancements that benefit the general public without increasing the costs to existing water users or developers of water projects are needed.

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Carlsbad Irrigation District

1) Water supply and Resource Management Coordination:

This topic lends itself more toward the storage and management of surface water supplies. However, in most river basins in the west there is a hydrological connection between groundwater and surface water. Federal entities rarely have involvement in administering ground water. However, most surface water supplies are stored in federal dams. The permitted right to use this stored water is administered by the states and local or private entities respectively. This relationship results in the need for coordination among local, state and federal entities.

Because most surface water supplies are stored and released from federal facilities, that action becomes subject to the federal Endangered Species Act (ESA). The ESA has had a very disruptive and expensive impact on the traditional water operations in the past two decades. However, in most instances those expensive operational modifications, both in water and money, have resulted in very few quantifiable positive results for targeted endangered species or their habitat. Improved coordination among federal, state and local entities has been one of the results of the impacts of the ESA.

Drought and increasing water demand by a growing population are two factors that have and will continue to require improved coordination in managing water supplies. In my opinion, state and local entities have the primary responsibility of planning future water use and recognizing and resolving conflicts. It is obvious federal interest must be included in this endeavor.

In New Mexico the legislature has authorized the Interstate Stream Commission to administer the drafting and implementation of regional water plans. The state is divided into ten regional water planning regions. In most instances, planning units are defined by a section of major river watersheds or, in some regions, closed basins. The ISC has developed a template that the plans must adhere to. The planning group includes county and municipal entities, irrigation and conservancy districts, industry representatives, such as mining, power generation, commercial dairies, the Bureau of Reclamation and tribal interests. The plan attempts to quantify the water supply and demand for a forty-year water planning cycle. The plan investigates increasing water yield, water conservation, implementing more effective conjunctive use of ground and surface water supplies and many other practices that could result in effectively using a limited water supply to meet a changing and growing demand.

In the lower Pecos basin, we have taken regional water planning a step farther. In July 2001 a task force was established under the guidance of the New Mexico Interstate Stream Commission. The task force was comprised of the major water users in the lower Pecos River basin. It included representatives of municipal and county governments, the Carlsbad Irrigation District, Fort Sumner Irrigation District, the Pecos Valley Artesian Conservancy District, the New Mexico Dairy Association and the Bureau of Reclamation. The charge of this group was to develop and implement a permanent solution for conflicts threatening the stable water supply in the basin. These primary

conflicts are the adjudication of the rights of the Carlsbad Irrigation District, the State of New Mexico=s order by the U.S. Supreme Court to comply with the Pecos River Compact to deliver the annual requirement of water to the State of Texas and to meet the water needs of the listed threatened Pecos Blunt Nose Shiner. The overriding threat is the water diversions in New Mexico could be stopped in order to make up an under-delivery to Texas by the enforcement of a Priority Call ordered by the Special Master appointed by the U.S. Supreme Court. This task force effort resulted in a Settlement Agreement signed by all parties and sanctioned and funded by the New Mexico Legislature.

Implementation of this agreement protects the economy in the lower Pecos Basin by avoiding a priority call that would shut down diversions in New Mexico and also providing a more dependable water supply to the Carlsbad Irrigation District, thus a more stable supply for the Pecos River Compact deliveries. The hydrological underpinnings of this agreement is based on a model developed by the ISC and private contractors.

To my knowledge, this is the first settlement of this type developed to solve a complex and contentious river basin problem involving an inter-state compact, state adjudication and conjunctive use of ground water and surface water.

I believe this approach will become the preferred method to resolving such conflicts throughout the west rather than a lengthy and expensive legal battle resulting in a court decision that might not be functional.

Senate Energy and Natural Resources Committee
Water Conference

Trout Unlimited

Topic Number 1 -- Water Supply and Resource Management Coordination

Trout Unlimited's Western Water Project seeks to solve water scarcity problems and enhance coordination among federal, state, and local interests in six separate western states for the purpose of protecting and restoring trout and salmon watersheds. Operating independently in each state, and working at the watershed level, TU's experience in productive collaboration in on the ground restoration, provides insights on how to approach coordinated water resources management. Overall, TU strongly believes that watershed level restoration efforts that include federal, state and local players are a very good model for coordination.

I. Coordination Among Local, State and Federal Interests is Imperative

Over-allocation is the root cause of water scarcity conflicts. In other words, too much water has been promised to too many people. Coordination among local, state, and federal interests is vital so that all affected interests are engaged in finding solutions that best fit a particular region or watershed. Existing federal laws provide an array of different tools that can assist such coordination including re-operating agreements and grants that support collaborative efforts.

A. Existing Federal Laws and Programs Provide an Array of Tools to Assist Coordination

As a result of the vast network of Bureau of Reclamation ("Reclamation") and Corps of Engineers water infrastructure across the West, the federal government has many opportunities to help implement solutions to western water resource challenges.

Committee Members may be aware of some of the successes that coordination efforts have already achieved on the endangered species front. One in particular illustrates the potential for re-operating federal projects in part to recover species. Under the auspices of the Colorado River Endangered Fishes Recovery Program, which involves the states, Reclamation, the Western Area Power Administration, the Fish and Wildlife Service, and others, Reclamation is changing the pattern of water releases from Flaming Gorge Reservoir on Wyoming's Green River. Reclamation made some operational adjustments in the 1990s, but more will occur following an in-process NEPA evaluation. The changes, which reestablish a more natural flow pattern in the river below the dam, have already had positive impacts on the downstream fishery.

Watershed level coordination, in and of itself, can often be the impetus to solving water conflicts. On the Sun River, a tributary to the upper Missouri River near Great Falls, Montana, two irrigation districts, private ranchers, Reclamation, state agencies, Trout Unlimited and others are working together to find ways to make Reclamation reservoir operations and irrigation deliveries more efficient in order to reduce water conflicts and put water back into the dewatered Sun River.

We are aware that Reclamation is seeking solutions to water conflicts through its Water 2025 program. While we support the principles of this program, we strongly recommend Congress encourage Reclamation to modify Water 2025 so that it can better realize its potential to produce solutions to water scarcity while promoting watershed

health. First, the Water 2025 Challenge grant program's eligible activities should be expanded to include design and feasibility work, which for river restoration usually entails assessing the flows needed for ecological health.

Second, while we agree that water banks, water markets and temporary leasing arrangements, including fallowing, hold much promise for accomplishing the goals of Water 2025, these tools can be much more beneficial and effective if they are combined with broader strategies, such as re-operation of infrastructure, reductions in physical losses from the system, reductions in percolation losses to saline aquifers, on-farm efficiency improvements, and conjunctive management of groundwater and surface water. As such, TU recommends that Congress persuade Reclamation to include projects that specifically have a flow restoration component in its universe of projects that receive Water 2025 grants.

Third, while we agree that Water 2025 projects should be undertaken with the full agreement and participation of the irrigation districts serviced by Reclamation projects, we recommend that a broader array of entities should be eligible for receive grants. Such modification will ensure the most productive collaborations. In our experience, some of the best ideas and the initiative to implement them sometimes originate outside the districts themselves.

Finally, we recommend that Congress persuade Reclamation to modify the Water 2025 grant program matching fund requirements. Matching funds are most appropriate for capital improvements, that presumably return ample benefits to the water district that provide such funds. Ecological restoration projects, such as those that have a flow restoration component, do not generate a revenue stream that would facilitate a cost-sharing requirement. Therefore, we specifically recommend that collaborative restoration projects be exempt from the matching fund requirements.

Just as important, if Congress agrees to Reclamation's request to increase Water 2025 funding by $13 million, it should not do so at the expense of other crucial programs that fund collaborative efforts to seek solutions to our water challenges as the FY 2006 budget appears to do. For example, the budget cuts funding for water reuse projects by $16 million and cuts funding for desalination and water purification by $5 million. It also cuts funding for endangered species recovery activities.

Recommendation: Congress should encourage Reclamation to modify Reclamation's Water 2025 program to incorporate the changes outlined above. In addition, if Congress agrees to increase funding for Water 2025, it should not do so at the expense of other critical programs that provide federal resources for collaborative efforts.

B. The Federal Government's Duty to Protect Aquatic Resources Benefits Both Local Economies and the Environment

As the largest land manager in the West, the federal government has a responsibility that includes wise stewardship of its natural resources, including the rivers

flowing across federal lands. This responsibility consistently appears in federal laws governing the Forest and Park Services, as well as the Bureau of Land Management and the Department of Defense. Other federal agencies, including Reclamation and the Corps, also have the authority, and in some cases, the duty to use their facilities to protect ecologic values and provide recreational benefits.

Properly exercised, federal stewardship enhances both the natural environment and local economies. For example, farmers near the Rio Grande National Forest in Colorado supported the forest's efforts to establish its federal reserved water right because such establishment benefited the farmers' operations.

Yet, TU is aware that many federal agency attempts to protect rivers have been controversial. This is true whether the tool the federal agency has used involves re-operations of federal dams, the designation of a wild and scenic river, imposition of bypass flows in federal permits, acquisition of federal reserved water rights or the denial of Clean Water Act permits for dams or diversions. Voluntary, cooperative deals which conserve, protect or restore the targeted resource can be an excellent alternative to the unilateral exercise of federal authority, but only if they result in real river protection. And the only way the federal government can negotiate meaningful deals is if it demonstrates a willingness to use its legal authorities.

Consider the situation of the Black Canyon of the Gunnison, a National Park in Colorado, originally established as a monument to protect not only the deep, narrow and dark canyon, but also the roar of the river. In 2001, the Park Service filed to quantify its federal reserved right based on a natural flow regime that would have included yearly peak flows to scour out accumulated sediment and pollution. This filing was based on a Park Service model that was the result of a decade's worth of research and almost a century of data. Nonetheless, facing opposition from the state and some water users, in 2003, the Park Service signed an agreement with the state for a right to only a minimum year-round base flow. A federal court subsequently determined that it is likely that the Park Service violated its Organic Act and NEPA in signing this agreement. Thus, the parties remain at an impasse, and the river's flows continue to depend on the largesse of Reclamation, which owns an upstream facility, rather than on the needs of the National Park.

Recommendation: TU recommends that the Committee reject any attempt to eliminate or weaken existing federal tools to protect rivers and streams. Properly exercised, federal stewardship enhances both local economies and the environment. In fact, as evidenced by the Blackfoot River partnership detailed below, federal laws often provide the incentive for people to work together. In addition, funding for federal agencies to assess, scientifically, the flows needs of rivers on federal lands will help to demonstrate the economic value of conserving these resources.

II. Lessons Learned from Watershed-Based Planning and Conflict Resolution: The Blackfoot River

The Blackfoot River arises near the continental divide and runs west for 132 miles to its confluence with the Clark Fork River near Missoula, Montana. It was part of the

route home for Lewis and Clark in 1805. For much of its modern history, it was known as a scenic river with great fishing. But by the late 1980s, many local residents expressed increasing concern that the fishing in the middle and lower reaches of the Blackfoot had severely declined. After some deliberation, people decided to form a local Trout Unlimited Chapter that included ranchers and other landowners, as well as anglers.

When the State Fish and Game regional fisheries manager told the newly formed Big Blackfoot Chapter that he had no population data, nor the funding to acquire such data, the Chapter raised the necessary funds in a manner of weeks and presented a check to Fish and Game. The agency's findings largely vindicated the apprehensions of the public; the fishery was not doing well.

One of the Chapter's first acts was to develop a cooperative agreement with the U.S. Fish and Wildlife Service (FWS) through its Partners for Fish and Wildlife Program to work on the restoration of the Blackfoot fishery. Throughout the restoration of the Blackfoot, both agency partners, the FWS and the state Fish and Game, have been responsive, innovative and critical participants.

In 1990, the TU Chapter and its partners embarked upon their first series of restoration projects. These projects focused on four areas—instream habitat restoration, enhancing instream flows, addressing fish passage barriers, and reducing the entrainment of fish into irrigation ditches.

Upon successful completion of several projects, interest in the restoration efforts grew, to the extent that, by 2001 (just ten years from the start), fish screens had been installed on diversions in 12 streams, fish passage structures had been erected on 26 streams, grazing management improvements were completed on 23 streams, restoration of riparian vegetation had occurred on 27 streams, and streamflow improvements were made on 12 streams. Moreover, in the face of severe drought, a basin-wide drought-response plan was created and first implemented in 2000.

The success of the Blackfoot River restoration rests heavily on a few key ingredients. First and most importantly landowners and other stakeholders support the projects because they have been part of the process from the inception. Second, the restoration effort has been fortunate in securing the necessary funding from a combination of federal, state, and private sources. Third, the projects have focused on key species that serve as indicator species. Fourth, government agencies have not attempted to direct the process, but rather to assist it as requested by other partners. The biggest lesson learned is that the restoration efforts have been successful because the work is viewed as building community and connection in the valley, rather than diminishing it.

Recommendation: TU supports adequate funding for programs such as the FWS' Partners for Fish and Wildlife Program because it provides critical funding for collaborative restoration efforts such as those on the Blackfoot River. However, such funding should be in addition to, and not in lieu of, sufficient funding for endangered

species programs which would be cut by $3 million in the FY 2006 budget request. TU encourages Congress not to view the situation as an "either or" proposition.

III. The Federal Government's Research and Technology Development Activities Provide Critical Data that Informs Collaborative Efforts

Another important role for the federal government in coordinating water management is conducting and funding research and technology development. The federal government already gathers and analyzes important water resource data. The United States Geological Survey ("USGS") monitors stream flows through a network of gages, and the Natural Resources Conservation Service also monitors and publishes snowpack data from its SNOTEL sites. This information is essential to the collaborative, watershed restoration work that TU is involved in. For example, the innovative drought response plans in Montana's Blackfoot, Big Hole, and Jefferson River basins all depend on the USGS flow reporting and SNOTEL forecasting.

Recommendation: Although the FY 2006 budget request includes a $300,000 increase for the USGS' National Streamflow Information Program, which funds the gages, TU strongly recommends Congress significantly increases funding for this program so that it can be expanded. Such expansion will help all of us better understand the resource we want to use and protect.

S. 177, the Salt Cedar and Russian Olive Control Demonstration Act, is an important model for two reasons. First, it focuses on adaptive science. In other words, it requires scientists to closely monitor how the watershed is affected as various experimental tactics are tried to address control of the invasive species. Second, the bill focuses not just on removal of invasive species, but also restoration.

Enactment of S. 214, the United States-Mexico Transboundary Aquifer Assessment Act, will provide exactly the type of information needed to address the long term implications of using a nonrenewable resource, namely, groundwater.

Recommendation: Congress should pass S. 177 and S. 214 and consider using these bills as models for future legislation.

TU's experience with innovative, watershed restoration and resolving conflict over water allocation issues across six western states has informed our comments. From effective use of federal authorities to protect water supply to a more expansive, inclusive vision for Reclamation's Water 2025 program, the genesis of TU's comments are on-the-ground stream restoration work. From TU's work in the Blackfoot River valley to the Black Canyon of the Gunnison, TU is engaged in the daily work of watershed health. From this perspective, watershed level coordination among local, state, and federal players has the best potential to greatly enhance water resource management and, ultimately, watershed health.

Senate Energy and Natural Resources Committee
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American Rivers

Response to Question #1: "Water Supply and Resource Management Coordination"

The United States is blessed with a vast and increasingly valuable fresh water supply that provides an essential foundation of our economic and ecological wealth, and provides for our high quality of life and increased life expectancy. Water is necessary for direct human use, but also for the species and ecosystems that sustain life. Cooperative, watershed based planning can address the essential goals of both adequate water supply and river health. Throughout the nation, water is increasingly in demand and increasingly scarce. Federal, state, and local cooperation with strong stakeholder involvement is the key to solving what will be one of the greatest environmental challenges of the 21st century.

A sustained and coordinated effort needs to develop at all levels of government to:

1. *Communicate and cooperate.* Sustainable water management requires inclusive cooperative agreements which, while difficult, are both possible and necessary.
2. *Invest more and invest more wisely.* We need to transport and store water more effectively, reduce actions that degrade water quality, and make necessary long-term investments in water treatment to support plentiful and clean water supplies.

Communicate and Cooperate

Maintaining river ecosystems and supporting human needs are both served by a continual supply of healthy, clean water. In-stream flow standards successfully maintained both river health and water supply in many areas. Basic standards for keeping water in streams are good for fish and wildlife, but also for recreation, drinking water, and other economic purposes. The federal government has a variety of tools that can be used to preserve in-stream flows, including the Clean Water Act, federal reserved and non-reserved water rights, the Endangered Species Act, federal dam operation, hydropower licensing under the Federal Power Act, federal land management practices, and the Wild and Scenic Rivers Act. States also have a variety of tools and many are taking an active role by legislating in-stream flows, using permit programs to enforce flow limitations, adding state-based permit requirements, using Clean Water Act Sec. 401 certification and Sec. 303(d) listings as an opportunity, granting or transferring in-stream water rights, mandating conservation programs and setting conservation goals. In-stream flow standards are critical not only to ensure the public has access to sufficient clean water now and in the future, but also to ensure that our rivers, wetlands and lakes retain sufficient water to sustain fish, wildlife and all of the ecosystem services that healthy freshwater systems contribute to our economy.

The Endangered Species Act has perhaps been the most controversial of the federal government's water management tools, but in many cases it has produced a positive and needed policy-making strategy for rivers – collaboration among stakeholders, states, and the federal family of agencies. The ESA has been extremely successful at preventing species from going extinct and disappearing forever, but its regulatory provisions should be used only as a last resort; at its best the ESA brings

affected interests together to find solutions for sustainable river ecosystems. Increasingly, ESA-inspired efforts to convene river basin interests around a table to discuss how to manage rivers and the numerous biological and socio-economic values these rivers support provides a model for how we should approach river management nationwide, but we should begin before species near extinction.

American Rivers is active in some of the most prominent collaborative efforts in the West, and these and other such efforts across the country access the talents and passions of a unique blend of agricultural interests, power producers, municipal water users, recreation interests, biologists, conservation groups, community leaders, and state and federal agency representatives. Though many of these ongoing efforts are the offshoot of litigation or are otherwise intertwined in ESA-related matters, their genesis is ultimately the desire of residents along prominent rivers to share in decision-making, help guide future water management, and more directly tie the economic health of their communities to the resources their rivers provide. Unilateral, command-and-control management of rivers, especially those that cross multiple state boundaries, has proven to be a divisive management paradigm that local interests are seeking to transform.

For example, since 1997 the states of Nebraska, Wyoming, and Colorado, with their partner federal agencies and stakeholder interests, have been negotiating future management of the Platte River. This process was born out of conflicts over managing the Platte to improve habitat along the river in central Nebraska to support four ESA-listed species (whooping crane, interior least tern, piping plover, and pallid sturgeon). Urban water use to the west and irrigation along the river in Nebraska had reduced Platte River flows; the river lost much of its historic shallow, braided nature and no longer provided the habitat necessary to support key species. Maintaining the Platte even for further human use was in peril, so the states and the Department of Interior have been meeting with key stakeholders to hammer out details for sharing the Platte's vital water, protecting and restoring important habitat for the listed species, and sharing responsibility for decision-making on the river in the long term. Federal and state funds are being pooled to meet land and water goals, and users from the agriculture, power, municipal, and conservation sector all have seats at the Governance Committee table and are intimately involved in deciding the Platte's future. This form of management serves as a model for other river basins to consider, as it allows those most affected by important public policy decisions over limited water resources to share in the decision-making process.

Similarly, the nation's longest river, the Missouri, has been marked by some of the largest and most complicated water resource and ESA litigation in the country over the last several years. Even though much of that litigation is ongoing, American Rivers is working with the Missouri River Coalition to restore a string of natural places, reform dam operations to aid river wildlife and recreation, and revitalize riverfronts. In 2002, the National Academies of Science published a report on Missouri River management noting that current unilateral management of the river by the U.S. Army Corps of Engineers was failing to help the river meet the best interests of those in the basin. The NAS team suggested that a new form of collaborative decision-making process be

developed among all the interests in the basin and given authority by Congress to determine the river's future. Today, conservation, agriculture, navigation, power, municipality, state, and federal parties are beginning that very process and preparing to develop a collaborative process to manage the Missouri's water and ensure the river is meeting the modern economic and environmental needs of the basin.

Interstate water compacts like those negotiated on the Platte and Missouri are widely used in the West to allocate water among states, but are also important in the eastern U.S. where limited interstate water supplies are increasingly squeezed by growing cities like Atlanta. The hydrologic and economic characteristics of river basins vary greatly, so a large set of possible solutions are best solved locally by stakeholders and states, with federal support of any outcome. Interstate surface water compacts allow states to solve their own interstate water problems with state solutions, avoiding undesirable federal intervention and preemption. Cooperatively developed interstate river compacts can be powerful, durable, and adaptive tools to promote and ensure cooperative action among the states. Federal mandates may dictate rigid requirements; interstate water compacts give states to the opportunity to develop and invest in collaborative and dynamic solutions for shared local problems.

We should also consider applying the lessons learned from surface water compacts to groundwater management. Groundwater is by far the largest potential source of fresh water, but withdrawals can be destructive to both surface and groundwater supplies. In many cases groundwater is critical to feeding rivers, but it is increasingly relied upon by agricultural and municipal users. Much of this water is not recharged quickly, and therefore escalating use is unsustainable and presents a looming future crisis. One example of the need for broad cooperation to manage groundwater is the Ogallala Aquife,r which sits under 8 states and is by far America's largest single source of fresh water. With few state restrictions or tracking of use, and growing demands, the Ogallala water level is sinking at a troubling rate and a cooperative solution is needed.

Invest More and Invest More Wisely

An essential feature of maintaining adequate water supply is maintaining the quality of source waters. Last year, American Rivers named the Colorado River the #1 *Most Endangered River* in America. This designation was based not on the ongoing drought's threats to water quantity in the river, but on a number of policy choices necessary to protect water quality in this essential water supply for millions of Americans in the Southwest. The water quality threats to this storied Western river remind us that we must at every level of government increase the investments necessary to sustain clean water supplies for our communities.

Before any level of clean water investment can protect our water supplies, we must address threats to water quality from the potential failure to enforce the Clean Water Act on small or intermittent intrastate streams, as suggested by a guidance document published by EPA and the Corps of Engineers. These small and intermittent streams are

essential to both the quality and quantity of water supply, as discussed in the joint American Rivers/Sierra Club report, "Where Rivers Are Born: the Scientific Imperative for Defending Small Streams and Wetlands." As indicated on the attached map, in New Mexico fully 98% of stream miles are non-perennial – if these streams are not protected from pollution or even eradication by fill, New Mexico cannot protect its water resources. Enactment of the Clean Water Authority Restoration Act would underscore the Clean Water Act's application to all of the West's waters.

But we also cannot ensure supplies of clean water without a major further investment our nation's in wastewater treatment. Since the specter of burning rivers led to the creation of the Clean Water Act in 1972, decades of work and billions of dollars in federal, state, and local funding on drinking water and wastewater treatment projects have set the global standard for water quality. These investments benefit our economy, public health, and the environment. Unfortunately, we are now witnessing a major shortfall in support for these essential projects. The combination of aging infrastructure, recent underinvestment, relaxed standards and enforcement, population growth and sprawl has brought us to the point where the water quality gains of the past are being lost and water quality is now trending downward. Former EPA Administrator Christine Todd Whitman warned that without a major new commitment to upgrading America's wastewater infrastructure, we would soon see water quality levels as low as the 1970s.

Where wastewater systems overflow, partially treated sewage is released containing viruses and bacteria that cause serious and potentially deadly diseases – cryptosporidium, hepatitis, dysentery, and others. The young, old, and sick are at greatest risk. Between 23,000 and 75,000 sewage overflows occur nationwide every year, resulting in the release of 3 billion to 10 billion gallons of untreated wastewater directly into our rivers and streams, according to EPA estimates. In many areas of the country, drinking water intakes can be found downstream of sewer outfalls.

One example of sewage releases harming our drinking water supply occurs on the Colorado River. Human waste from riverfront boomtowns in California and Arizona contaminates the river below Hoover Dam. Monitoring wells in the Lake Havasu area have recorded nitrate levels four times higher than the limits set by the Environmental Protection Agency (EPA) to protect public health. The communities relying on septic systems that are polluting the lower Colorado River require new infrastructure. In other areas, the need is replacement and retrofit, as many systems are using antiquated pipes that are 50-100 years old. The U.S. Environmental Protection Agency projects that $388 billion is needed to be invested in our water infrastructure from 2000 to 2019 to meet our clean water needs. Increasing population and urban sprawl stretch our previous water infrastructure investments to their limits, requiring miles of new pipe as well as treatment capacity.

The federal government should find assist state and local governments with the future investments needed for: (1) fixing leaking infrastructure to reduce water outflow from delivery pipes, and to prevent stormwater leakage into wastewater pipes; (2) recharging treated wastewater into local aquifers; (3) decentralizing wastewater

treatment; and (4) reusing and recycling gray water and wastewater. As we consider future investments at every level of government, we should encourage new construction to develop sewer systems that divide rainwater and runoff, human waste, and industrial waste into separate pipes and use different treatment systems. These practices reduce overflows and prevent problems with toxic sludge. Cooperative funding for cities and towns to improve infrastructure will prevent serious threats to public health, the environment and the economy.

Sound investment must be accompanying by an adequate regulatory system to support clean, safe water supplies. The *Save Our Waters From Sewage Act*, H.R. 1126 was introduced in the House a few days ago. This bill would ensure that EPA cannot reduce existing regulation of sewage bypasses from wastewater treatment plants, and set up a system to inform the public if such releases do occur.

Riverfront communities in Arizona and California recognize their wastewater treatment problems and are raising capital on their own to upgrade wastewater treatment capacities. They and other communities across the nation could use some help, but in recent years federal assistance to states for wastewater treatment facilities under the Clean Water State Revolving Loan Fund has been cut. The President's budget this year proposes even further cuts, with a gradual phase out of the program over the next few years.

The federal government must continue to support state and local governments' investments in safe and clean water. We urge the reauthorization and expansion of the both the Clean Water and Drinking Water State Revolving Funds (SRF) which the federal government uses to help local governments invest in needed wastewater and drinking water treatment infrastructure. These funds should also be extended to support innovative 'soft path' technologies for stormwater and wastewater management as well as more traditional projects, working with natural processes to reduce infrastructure costs while maintaining ecosystem services. We need not be limited by thinking of water infrastructure as the creation of concrete monuments.

Federal projects should be guided by the same goal of working with natural ecological processes. Stream buffers, infiltration swales, disconnected impervious surfaces, and restored and constructed wetlands can serve federal project purposes as well as local needs. The investment in infrastructure that works with natural processes will also ensure we continue to receive the other massive economic benefits provided by these natural hydrologic systems: flood control, water filtration and surface flow regulation. All levels of government should work together to encourage more efficient and sustainable water use and to harness enterprising creativity to improve best practices.

Conclusion

Federal, state, and local cooperation and coordination with strong stakeholder involvement, investing more in water management and investing more wisely, is the key to solving what will be one of the greatest environmental challenges of the 21st century

Senate Energy and Natural Resources Committee
Water Conference

Charles T. DuMars

1. Water Supply and Resource Management Coordination

As we have turned the corner into this new century, there is no doubt that water supply issues rise to the top. This is true in part because of absolute shortages that manifest themselves in areas where shortages exist because of increasing populations. Dry areas often make great places to live, but have insufficient water. Interestingly, the water supply is fixed, known and is finite. The problem is caused not because of a lack of sufficient water but of an excess of persons who choose to live where water is scarce.

Yet, those who have moved to the arid southwest cry drought when there is insufficient water to meet their newly created demands. The drought becomes the enemy, not the lifestyle choices that placed these populations where there is insufficient water supply.

The solutions are fairly straightforward - import water from another location, find new sources of supply in the area, treat existing heretofore not useful water such as brackish water and effluent, use less through conservation, or take out of production current uses and move that water to municipal uses.

Importation is an attractive sounding solution, but is fraught with institutional difficulties. While this is indeed one United States, and the Supreme Court has declared that embargoes on resources are not constitutionally permissible, any attempts to deplete the water resources of current users or future generations to benefit those in another region or state are received with stiff resistance. Utilizing effluent and brackish water are practical solutions, but often come at costs that are higher than other alternatives such as conservation and moving water from a so-called lower valued use, at least in economic terms. While conservation is the politically correct solution and is certainly required, the methods for actually eliminating consumption of water quickly reach their limits, at least with respect to domestic uses. This leaves movement of water from existing uses such as agriculture to municipal and other uses.

One could proudly announce for example, that if one were to build a new town that was composed exclusively of stock brokers, telephone conference centers, computer information technology that moves information from one place to another and real estate for sales of new homes for those who move to the twenty first century community, very little water would be required. And, if there are no lawns, no parks, no other aesthetic uses of water the demand could be reduced dramatically.

The problem, of course, is that such a community presupposes that somewhere else, others are utilizing water for uses that produce wealth through production of crops, chips, coal fired energy plants, nuclear energy plants, aesthetic tourism, eco-tourism, movement of goods through barges, and so on. It is not clear to me that in the long-term societies can function and thrive on the transport of information and wealth transfers without need for the use of water as a part of production. The United States has exported the production of steel, the processing of timber, is exporting coal to China in record amounts, has exported the assembly of things to developing countries and is looking

forward to exporting the bulk of its food. We look to the importation of other comparable minerals such as oil and gas to sustain our transportation corridors. The question then becomes whether it necessarily follows that we should value water solely as a mechanism for sustaining our capital movement cities or whether there are independent values in water. Simply put, whether the concept of the public welfare value of water is capable of being captured through a single lens that relates water as the inevitable support systems for communities in arid climates or whether a broad section of uses for the resource should be recognized and integrated into public policy decisions, both in evaluating water markets and informing water administrators.

Conflicting Values Included in the Concept "Public Welfare"

Even though members of society are concerned about the "public welfare", there is never unanimity as to its meaning. Visualizing various values in water as located upon a continuum can help, perhaps, to clarify this subject. At one end of the continuum would lie values that are widely and strongly held. Water resources protected by law might be placed here. Through the Endangered Species Act, for example, Congress has preserved the water habitats of certain birds, fish, and other kinds of wildlife. Similarly, as noted above, the federal government has asserted water rights in national parks, Indian reservations, and other areas it has set aside for special purposes.

At the other end of the continuum would lie values that are so abstract or impractical they are unlikely ever to command a large constituency. Here, then, might be placed the sentiments of people who cherish the image of free running streams and, regardless of the impact, insist that no stream be impeded in its flow to the sea. Between these extremes are a number of other publicly held values in water. Examples of these are set out below.

ENVIRONMENTAL, RECREATIONAL, AND SCENIC VALUES

Almost all western states have recognized public benefit in preserving water flow in some stretches of perennial steams and rivers. Protection of a certain level of streamflow is justified on several grounds. It maintains bacterial activity that cleanses the stream, dilutes municipal and industrial discharge into the stream, carries potentially clogging sediment downstream, ensures survival of fish and other aquatic life, and sustains vegetation in the bed and on the banks of the stream. This vegetation, in turn, serves as habitat for wildlife and waterfowl and acts as a filter by trapping polluting substances carried in return flow irrigation water and other runoff.

Other values in retaining water in streams and rivers are shown in the popularity of sport fishing, swimming, boating, rafting, and other purely recreational activities. In addition, there is clearly some value held in the enjoyment of the scenic quality of rivers, and of watersheds generally.

ECONOMIC VALUES

In addition to directly sustaining physical life, water has other properties that, directly and indirectly, sustain economic life. It is among the most fundamental of the "means of production". As a source of buoyancy and momentum, channeled water can carry heavy objects from place to place, and can carry away and dilute the effluent of factories and businesses. Quantities of captured water, converted to steam or hydroelectric power, can serve multiple energy needs and at great distances from rivers and reservoirs.

In the end, the availability of water determines the feasibility of nearly all commercial enterprises. Some of these – in the West most notably large-scale irrigated agriculture, mining, and oil exploration – require large amounts of water. Other businesses that do not themselves use great quantities of water depend on businesses that do. Manufacturers of farm implements, wholesalers and retailers of seed and fertilizer, trucking companies, packagers, advertisers, grocers and their customers all rely on the products of farming. Similar dependency networks radiate from the logging camps, mines, quarries, and oilfields of resource producing western states. Thus, water underpins not only the tax base of towns built around highly water-consumptive industries, but, ultimately, the tax bases of remote, less water-consumptive, cities.

HISTORIC AND CULTURAL VALUES

For many people, water has significant cultural value apart from its importance as an economic commodity. In New Mexico, this value is evident in the traditions of historic communities. Among the many New Mexicans descended from aboriginal Indians and 16th century Spanish settlers there are some who make their living by subsistence farming and livestock grazing in the tribal pueblos or rural villages built by their ancestors. In these enclaves of nearly extinct cultures, community values in water are manifest in physical structures – the hand dug ditches through which water can flow to all parts of the villages – and in social structures – the respected practices of using and maintaining the ditches. Field crops are irrigated and stockponds filled by water diverted from nearby sources and carried through this network of ditches, or acequia.

Adherents to these traditional ways of life revere water as a sacred substance, the lifeblood of society. Reverence for the life-giving power of water extends to everything associated with water. The seasonal changes and corresponding changes in rainfall and river flow are observed by time-honored rituals, dances, and feasts. These events, along with the handicrafts, music, and other creative works the events inspire, are the basis of a substantial portion of New Mexico's tourist trade, which is one of the state's primary industries.

CONSERVATION VALUES

Where water is scarce, the tendency to prefer present over future uses is strong, and the duty to ensure usable water resources to future generations, while generally acknowledged in principle, often suffers in practice. Still, partly because the disastrous effects of improvident resource exploitation are now being felt world wide, value in long-term management of water and other resources is today expressed more earnestly than in the past.

Senate Energy and Natural Resources Committee
Water Conference

Idaho Department of Water Resources/Idaho Water Resources Research Institute

Purpose

This proposal was prepared in response to the upcoming conference hosted by Senator Domenici and the Senate Energy and Natural Resources Committee and addresses the Water Supply and Resource Management Coordination topic.

Background

As identified in many recent publications, the United States is facing severe challenges in our ability to meet the growing demand for water in sustaining hydropower generation, agricultural based economies, urban center development and our natural environment (NRC 2004, DOI 2003). A number of these publications have also pointed to key factors that have led to these current challenges, which include:

(1) A lack of investment in water research and technology development (NRC 2004);
(2) Long-term climate variability and natural hazards (AWRA 2005);
(3) A decline in our nations water supply and delivery infrastructure (AWRA 2005)
(4) Loss of potable water supplies due to contamination (Lawford et al. 2003); and
(5) A lack of a coherent national water resources strategy (AWRA 2005).

There are a number of entities across the United States that range in size from federal agencies down to individual persons that will have a role in addressing our nation's water problems. In general, the Department of Energy's network of Laboratories, and some University Research Centers, have the capability to research and develop broad scale technologies that can increase water supplies and water use efficiencies. Every state has at least one, and in many cases multiple, academic institutions that have the capacity to provide increased knowledge on effective mechanisms to manage our nation's water resource's supply, demand and infrastructure. Many of these institutions, through their state extension services, also have the capacity to disseminate this information and aid state agencies in the training of technologists that can apply this knowledge to existing and emerging water resource problems. In addition, all states currently have agencies whose missions are defined as managing and regulating the quality and quantity of their water resources. Finally, the implementation of new technologies will continue to be the domain of private water users, municipal utilities or cooperatively managed water or irrigation districts.

The State of Idaho is currently engaged in collaborative efforts to resolve conflicts between senior surface water and junior ground water users. The potential effects if the issues are not resolved and water rights for the junior users are curtailed would be a tremendous impact on state and local economies. Early estimates ranged from $750 to $900 million dollars annually. An initial framework for a long term agreement has been proposed which is designed to effectuate a net change of 600,000 to 900,000 acre feet of water annually. This is a significant amount of water that will require both demand reduction and supply enhancement. Many of the principles included in the framework include the development of water conservation and supply enhancement technologies. Partnerships have already been developed related to building ground water modeling

tools to quantify alternative management scenarios. Now additional assistance is needed to research and develop technologies and tools required to increase supply, reduce demand and to monitor the effects of management changes on the surface and ground water resources.

Any solution to our nation's water resources challenges will have to not only construct a mechanism to coordinate the flow of knowledge and information through all of these entities, but also be able to demonstrate the value of this knowledge once it moves beyond theoretical study and into practical application.

Proposal

To address the issue of Water Supply and Resource Management Coordination, it is proposed that funding for the development of Regional Water Resource Technology and Research Consortia be provided as part of the proposed legislation. These consortia should be developed on a watershed basis and should be an equal partnership between DOE laboratories; academic institutions, state water resources planning and management agencies, and cooperatively managed water systems in the development of the region's research and technology plans. In addition, these consortia should identify an area within their region that can be used as a 'test bed' for newly emerging water resources research and technologies. Each region's 'test bed' will serve as an experimental proving ground for new research and technologies that address the region's water supply, water use efficiencies, and water supply and demand forecasting methodologies. In addition, these test beds can serve as the technology transfer and educational platform for disseminating knew knowledge and tools that address each regions water resources issues.

It is further proposed that the Idaho Department of Water Resources and the Idaho Water Resources Research Institute be the lead non-federal partners in a consortium with Idaho National Laboratory (INL) representing the Central Regional DOE area as defined in the Proposal to Establish the Energy-Water Technology Program with the Department of Energy (Multi-Laboratory Energy-Water Nexus Committee 2005). This consortium would encompass the Snake River, Bear River and Spokane River watersheds. Within this region, it is proposed that the Eastern Snake River Plain become the experimental 'test bed' for the region. The Eastern Snake River Plain is an ideal test bed in that there has already been a significant amount of water resources information collected in the area to support the East Snake Plain Aquifer adjudication process, it underlies the INL, significant conjunctive administration of surface and ground water issues have arisen in the East Snake Plain area are now emerging in other watersheds in the region, and there are a number of projects and research that are currently being proposed and undertaken to help resolve the issues. These include:

1. Developing and predicting the impact of a weather modification program to increase water supplies on the Upper Snake River;
2. Development of water supply technologies and management strategies for the Idaho aquaculture industry.

3. Development and implementation of advanced evapo-transpiration prediction technologies for the East Snake Plain area;
4. Development of methods to improve the forecasting of reservoir, runoff and groundwater contributions to East Snake Plane Water Supply.

The consortium would immediately begin work on researching and developing technologies to reduce water demand and enhance supply in the Snake River and Eastern Snake River Plain Aquifer. As theses technologies and techniques are developed, they will be applied to the Spokane River/Rathdrum Aquifer and Bear River basins. Both of these areas cross state boundaries and will require expanding the collaboration of Washington and Utah state agencies and research organizations.

Benefits

The approach described above would provide a structure to ensure that new and effective water resource information and technology would not only address the most important regional issues, but also ensure that this information would move efficiently from being a theoretical idea, through development of applied technologies, to implementation and evaluation of these technologies where they are most needed. This approach would leverage the existing strengths of entities already engaged in the research, development, planning, management, regulation and use of water resources, and would thus ensure both a cost effective strategy, and a collaborative engagement of these entities, in solving the nation's water resources problems. The INL is well suited to support this effort and has a long history of involvement in water issues and water resource research capability. The current drought and controversy regarding water allocation and management in Idaho provide an important opportunity for collaborative research and technology development. The results and capabilities developed by the consortium can be used and expanded to other western states that are dealing with similar issues.

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