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WATER SYMPOSIUM

SYMPOSIUM

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

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FIRST SESSION

ON

WATER ISSUES

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WATER SYMPOSIUM

TUESDAY, APRIL 5, 2005

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The symposium was convened at 2:25 p.m. in room SD–366, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. Thank you all for coming. First of all, I want to thank all the groups and individuals that submitted proposals. Obviously, there is a genuine interest in issues pertaining to water—water augmentation, water purification, the delivery of water. We have received over 130 written ideas, proposals, and suggestions.

I would like to thank the participants and all of those here in the audience that are interested in this discussion. The high level obviously reflects our shared concern for the resource called water in our different regions and in the country.

Federal water resources management and development efforts in the 20th century have produced a complex web of governing authorities, everything from Federal and State laws, compacts, contractual obligations, often fragmented Federal agency rules. Now at the beginning of the 21st century, the 109th Congress, we are faced with an ever-increasing demand for water due to such factors as drought, aging infrastructure, limited funding, tribal needs, and various water rights claimed by individuals and groups.

This afternoon we are going to discuss with our four panels water supply and resource management coordination, the future of the Bureau of Reclamation, Indian and Federal reserved water rights, conservation and technology development. It is my hope that today's discussion will lead to some items that can be considered in legislation and initiatives, legislative initiatives here in the Senate.

It is of interest that we move along in some kind of a regular pace, so we will move on to the issues at hand.

Senator Bingaman, I am glad that you are attending today and thank you for helping us with your suggestions and your staff suggestions. Now I would be pleased to yield to you.

STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

Senator BINGAMAN. Thank you very much. Thank you, Mr. Chairman, and thanks for holding this conference on this very important set of issues.

I do think that it is very timely. These are issues that are of vital concern, of course, to people in our State. We hear about them at all times. I sense a real disconnect between the level of concern about these issues in New Mexico and much of the West, I believe, and the level of concern that we have here in Washington. I do not think that there is near enough attention to these issues here.

I have been particularly concerned that when you look at the budget that we have been presented with this year, whether you are talking about EPA's funding, or Department of Agriculture's funding, or Corps of Engineers funding, or U.S. Geological Survey, or the Bureau of Reclamation, all of those agencies are proposed for significant cuts in their water-related work. I think that is very much a disconnect from what I think ought to be the priority.

So I think this conference is a great chance for us to get the issues out and hopefully get more attention to them, and I look forward to working with you to see if there are legislative efforts we can make to pursue some of the suggestions we hear today.

Thank you.

The CHAIRMAN. Thank you very much.

We have two other Senators. Senator Thomas or Senator Smith, would you like to comment? You are welcome to.

STATEMENT OF HON. CRAIG THOMAS, U.S. SENATOR FROM WYOMING

Senator THOMAS. I think there are plenty of people here to comment. Thank you. There are lots of folks here to comment. I will wait.

The CHAIRMAN. He has got a real bass voice today.

Senator Smith.

STATEMENT OF HON. GORDON SMITH, U.S. SENATOR FROM OREGON

Senator SMITH. Mr. Chairman, I am here because this is the current Federal water establishment. It is a picture of dysfunction. In a time when the West is in drought, in a time when we have obligations to Native tribes, we have got to figure out a better system than just this kind of bureaucracy to allocate this precious resource.

It was Thomas Jefferson—no, not Thomas Jefferson. It was Benjamin Franklin who once wrote "When the well is dry, we know the worth of water." I think our well is dry and we have got to find a better way to establish its allocation and its worth.

The CHAIRMAN. Thank you very much, Senator.

Now, we are going to proceed in some kind of orderly fashion if I can figure it out here. On this side we have some resource people, right? In the event we need you or somebody raises a question, you will be available, but otherwise you are not going to give us prepared statements; is that correct?

So we can all see who they are: the U.S. Corps of Engineers, Fred Caver; Diane Regas from the Environmental Protection Agency.

Can you help me with the next one?

Ms. BACH. Yes, Mr. Chairman. Maryanne Bach, Bureau of Reclamation.

The CHAIRMAN. I cannot see that.

Mr. Carter: And Gary Carter, National Oceanic and Atmospheric Administration.

The CHAIRMAN. Very good.

On this side we are going to start like this and go that way. You know your instructions. We will start with you, Mr. Underwood, Metropolitan Water District of Southern California.

STATEMENT OF DENNIS UNDERWOOD, METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Mr. UNDERWOOD. Thank you, Mr. Chairman. Thank you, Senators, for being here. I really appreciate the national focus that is being placed on the need for coordination. All of our resources, they are shared resources. That just implies that you need coordination, not only—if you do coordination, you also get added values.

I do not think I have ever been asked to stay only 2 minutes and I will try to do that.

If you are looking at coordination, a lot of that now gets into integrated resources. The reason that you are seeing integrated resources is it comes to the best approach to meet various objectives. The objectives are in terms of water supply to provide for water reliability. That includes having flexibility in the plumbing to move water when it is available, and also to have storage. The adequate storage is beginning to play an even greater role if you look at the Colorado in the last 5 years.

Water quality, diversity, the idea of desalting brackish water. How do you bring new waters into the system? Saline waters, other water supply options. Recycling, conservation can all play a major role and are not necessarily concerned about drought or shortages. They are hydrologic dependent.

You do need in coordination, it does need a partnership between Federal, State, and local and regional agencies. You need to go on the basis of beneficiary pay because you cannot always rely on State and Federal funds, but there are a role for Federal funds. By having integrated resources, it does define the best approach and where those funds can be made most useful.

I will give a few examples and I will close with a few examples of how integrated resource planning can play a major role. MWD has what we call an integrated resources plan. It took 3 years to develop. It looks at a variety of water supplies. You look at the CALFED, which is the Federal-State, 23 agencies involved. If you look at the Colorado River management, that is an effort that has been basin States and local entities, water users, and the Federal Government. Then you look at multistate salinity coalition and more recently the signing yesterday of the Lower Colorado Multi-Species Conservation Program, where you are looking at a whole regimen of a river, over 400 miles to provide for 27 species.

Those are examples of what we need to be doing, and it helps to provide for more effective as opposed to individuals trying to address these problems.

With that I will close.

[The prepared statement of Mr. Underwood follows:]

PREPARED STATEMENT OF DENNIS UNDERWOOD, 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 California 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 *CALFED Bay-Delta Program*, 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."

The CHAIRMAN. Thank you.

So we are going to proceed now with the State of Colorado Department of Natural Resources, Rod Kuharich.

STATEMENT OF ROD KUHARICH, DIRECTOR, COLORADO WATER CONSERVATION BOARD, COLORADO DEPARTMENT OF NATURAL RESOURCES

Mr. KUHARICH. Mr. Chairman, thank you very much.

Rod Kuharich. I am the director of the Colorado Water Conservation Board, established in 1937, which plays a critical role in the development of water policy for the State of Colorado.

In 2003 the legislature directed us to do a basin by basin study of the entire State. We looked at water demands, we looked at water supply, and we looked at projects and processes to meet those demands. We created basin roundtables, a bottom-up approach which involved agriculturalists, municipals, water providers, environmentalists, recreationists, and general citizens to work through this process.

Three factors drove Colorado. One is it is the third fastest growing State in the Nation. How we use and value water in Colorado has been changing. There is a greater need for municipal domestic water. There is a greater interest in the use of water for environmental and recreational purposes, and clearly the 2002 drought brought this to people's minds.

We have three goals: examine all aspects of Colorado water use for the next 30 years, evaluate water supply and management alternatives, and formulate strategies to build consensus and alternatives to meet those water needs.

It was the most comprehensive look Colorado has ever taken at its water supply picture. In 2030 Colorado is expected to grow by 65 percent and we will be approximately 630,000 acre-feet of water short of where we are today.

The providers have basically done a good job. The success of their plans is somewhat uncertain because of legal, political, regulatory issues and these have historically hampered Colorado's water development. We will require in the future multiple solutions—conservation, reuse, agricultural transfers, and new storage.

Conservation and efficiencies will be a key tool. However, they will not meet our future water needs. New water development and transfers from agricultural use will all be part of the mix.

There were three key findings that we came up with out of this study. The first is the need for funding at the State and Federal level. Federal funding to support water supply and water resource projects through grants, loans, or related mechanisms must continue with minimum strings attached.

Project permitting was identified as one of the primary impediments to water supply projects and has the greatest impact on the uncertainty associated with the identified projects and processes. Federal permitting triggered by authorizations, funding, rights of way, licenses, and Endangered Species Act, or section 404 of the Clean Water Act can entangle projects for years and cost millions of dollars. Streamlining these permitting processes are important.

Finally, environmental and recreational interests, as well as local government agencies, use these processes in order to create opportunities to have their voices heard. These regulatory processes are viewed as the only way that these interest groups can have meaningful input to ensure that local interests in environmental and recreational opportunities are protected.

The development of alternative means to provide for environmental and recreational enhancement that benefit the general public without increasing the cost of water projects are important to develop.

With that, Mr. Chairman, I will close and respond to questions. I did prepare a statement and the staff has compact disk copies of the entire report for the committee. Thank you.

[The prepared statement of Mr. Kuharich follows:]

PREPARED STATEMENT OF ROD KUHARICH, DIRECTOR, COLORADO WATER CONSERVATION BOARD, 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 commu-

nities 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*

Ground Rules

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.

The CHAIRMAN. When did you say that the study was ordered?

Mr. KUHARICH. The General Assembly asked us to do this study in 2003, right on the heels of the 2002 drought, Senator.

The CHAIRMAN. And you finished it? How long did it take?

Mr. KUHARICH. 18 months. We finished it last November, with the report to the General Assembly and to the Governor.

The CHAIRMAN. We are going to then move to our third participant, Tom Davis. He is from the Carlsbad Irrigation District in Carlsbad, New Mexico.

STATEMENT OF TOM W. DAVIS, MANAGER, CARLSBAD IRRIGATION DISTRICT

Mr. DAVIS. Thanks, Mr. Chairman.

I too submitted a detailed comprehensive paper to address this topic. What I plan to do in this 2 minutes is just make some general statements that apply probably throughout the West. The detailed topics that I submitted deal specifically with New Mexico and particularly the Pecos River Basin, with which I am somewhat familiar.

But in general I think all of us throughout the West are grappling some with the same problems. We need to keep in mind two factors when wrestling with these problems: The Earth contains the same amount of water today as it did when mankind arrived; and only a small percentage of the Earth's water is potable. So for thousands of years mankind has tried to deal with these problems of getting water in a usable form at the necessary location for use. In an attempt to do that, we build dams to store surface water, we transport water from areas of excess to areas where water is needed. We have learned to pump underground supplies. We make saline water potable. We conjunctively use surface and ground water. We are learning to resupply depleted underground aquifers.

However, there are a number of inherent problems associated with many of these practices. We must consistently try to mitigate ways to deal with these inherent problems. But let me suggest that we have enjoyed some good success, because never before in the history of mankind have we had more of an economical, dependable, safe supply of food and water than we enjoy today in these United States. We are living healthier and we are living longer.

In the Western States, agriculture has accounted for about 80 percent of the permitted use in the last century. Due to a growing population and drought and certain Federal laws and interstate river compacts, these items have fueled a demand to change the permitted use from ag use to other uses. I believe it would be—we would be foolish to sacrifice all of our western ag water use and our western ag production by transferring this use to municipal and environmental purposes.

But we must strive to reach some solution to these problems. I believe that, at least in my experience, lengthy and expensive court battles often result in court decisions that are unworkable and create more problems than they solve. I do not think courts are the best answer. It is my belief that problem-solving is made possible by open, positive discussion, having a thorough understanding of the problems, and setting reasonable targets. Sound policymaking must be based on sound science.

The solutions to our water supply problems will be found through application of technology, sound economic principles, sincere collaborative effort, must involve Federal and State entities, national labs, university research centers, both ground water and surface water managing entities, private industry, local governments, recreational and environmental interests. The rights of existing permitted senior water right holders must be protected through this process.

Such efforts take time. Conferences——

The CHAIRMAN. Mr. Davis, your time is up.

Mr. DAVIS. Okay. Thank you.

The CHAIRMAN. Do you want to finish with a sentence?

Mr. DAVIS. I say conferences such as this are only the beginning steps to dealing with our problems.

Thank you.

[The prepared statement of Mr. Davis follows:]

PREPARED STATEMENT OF TOM W. DAVIS, MANAGER, CARLSBAD IRRIGATION DISTRICT

TOPIC 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.

The CHAIRMAN. Thank you very much.

Now we have Trout Unlimited, Melinda Kassen. Thank you for coming, Melinda.

STATEMENT OF MELINDA KASSEN, DIRECTOR, COLORADO WATER PROJECT, TROUT UNLIMITED

Ms. KASSEN. Thank you, Mr. Chairman, members. I am the director of Trout Unlimited's Colorado Water Project. We have six State offices working to solve water scarcity problems while also protecting trout and salmon in the West. With over 70 percent of native fishes endangered, threatened, or simply not there any more, watershed level cooperative efforts focused on increasing water supply for municipal and other uses must also help restore rivers.

TU believes that the Federal Government has a unique role to play in Western water management. Most water users focus on securing their own water supplies. Because of our National environmental protection laws, Federal land holdings, and the network of Federal water infrastructure projects, this government's presence in and financing for cooperative efforts is necessary to protect our Nation's fisheries.

Re-operation of Federal facilities can restore or at least conserve important Native and recreational fisheries. Allowing the use of Federal facilities to facilitate temporary water transfers as well as conjunctive use of ground and surface water can expand the water available to new uses without further environmental degradation.

Water 2025 grants should go to projects that increase traditional users' efficiency but also conserve and restore healthy rivers and fisheries.

Congress should also maintain the Fish and Wildlife Service's Partners for Fish and Wildlife Program, which provides critical funding for collaborative restoration efforts. It was this program that TU was involved with on the Blackfoot and it played a critical role in the restoration of that fishery.

Maintaining Federal authorities to require water for in-stream protections consistent with Federal land management requirements is also important. The Federal Government should support voluntary measures and State programs for accomplishing these same goals, but without the backstop of Federal authority voluntary measures are less likely to achieve results.

The Federal Government provides critical funding for data collection, research, and technology development. We all need the data from the Geologic Survey's National Stream Flow Information Program, the gauges. Please not only restore funding but increase funding for this program. And the Federal Government can also play a role in terms of research. As I said, two good examples I believe are bills that you are involved in, S. 177, the Salt Cedar and Russian Olive Control Demonstration Act, as well as S. 214, the United States-Mexico Transboundary Aquifer Assessment Act.

Thank you and I would be happy to answer questions.

[The prepared statement of Ms. Kassen follows:]

PREPARED STATEMENT OF MELINDA KASSEN, DIRECTOR, COLORADO WATER PROJECT, 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 reoperations 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's 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.

The CHAIRMAN. Thank you very much.

American Rivers, Elizabeth Birnbaum.

STATEMENT OF ELIZABETH BIRNBAUM, VICE PRESIDENT FOR GOVERNMENT AFFAIRS, AMERICAN RIVERS

Ms. BIRNBAUM. Good afternoon. My name is Liz Birnbaum and I'm vice president for government affairs for American Rivers, an organization dedicated to protecting and restoring healthy rivers and the variety of life they sustain for the benefit of people, fish, and wildlife. On behalf of our 45,000 members, I want to thank Chairman Domenici and Senator Bingaman for convening this important conference and for the opportunity to participate.

Given the limited time, I will just touch on a few issues: the need to develop cooperative strategies to address water supply, the need to invest more and invest more wisely in necessary infrastructure to maintain water quality and manage storm water more effectively, and the need for careful analysis of proposals for new water storage.

The papers submitted for this panel underscore the need for cooperation and coordination. I note that three separate submissions gave examples of how limits placed by environmental regulation have led to the development of cooperative solutions for water supply conflicts. Our river systems are reaching the limits of ecosystem sustainability and environmental laws like the Clean Water Act and the Endangered Species Act are beginning to place hard limits on how much water we can divert.

The instinctive response is to blame these laws and call for their amendment or repeal. But the real answer is to come together and work out coordinated solutions for ecosystems and people, preferably before impasses arise.

At the same time that we need to work together to find solutions, we must invest more in infrastructure to maintain clean water supplies. Polluted and contaminated waters cannot serve our water supply needs. To meet the national shortfall in waste water treatment funding, we must increase investment, but also find ways to spend more wisely on infrastructure that works with natural processes. Treating storm water as a waste stream diminishes both ground water supplies and base stream flow, while finding ways to increase recharge reduces waste water treatment costs as well as sustaining supplies.

Finally, on new water storage. While new storage may at times be necessary, it should always be based on an accurate analysis of needs and a complete survey of alternatives. Any new storage should be subject to rigorous economic analysis, including both societal benefits from the use of the new water and ecological impacts

of the project. And alternatives should always include water conservation and reuse.

Thank you.

[The prepared statement of Ms. Birnbaum follows:]

PREPARED STATEMENT OF ELIZABETH BIRNBAUM, VICE PRESIDENT FOR GOVERNMENT AFFAIRS, 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 pro-

vide. 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 the 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 Aquifer, 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 Presi-

dent'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.

The CHAIRMAN. Thank you very much.

Senator Craig is going to proceed. We are going to take Charles DuMars next.

Senator CRAIG [presiding]. All right. Mr. DuMars.

STATEMENT OF CHARLES T. DUMARS, ESQ., PROFESSOR EMERITUS, UNIVERSITY OF NEW MEXICO SCHOOL OF LAW, AND RESOURCE PLANNING ASSOCIATES, P.C., ATTORNEYS AT LAW

Mr. DUMARS. Thank you. Senators, thank you for inviting me to come speak to you today. I represent numerous private water users, over 100,000 acre-feet of water in different sectors, as well as Intel Corporation and other entities that use water for productive purposes.

My point is a simple one. Water is a mineral. It is like oil and gas, but it is a mineral. We currently in our planning and in our treatment of the water resource behave as though it were not an essential part of production of food and production of energy resources. We need to do better at that. We need to focus in all our future analyses of water supply on the question, is there going to be sufficient strategic water reserve available for future generations so that we can continue to produce food and develop the energy production we have.

I was surprised to hear Senator Bingaman suggest there was not a sufficient in his view in this topic. In my view there is a tremendous security interest in ensuring there is adequate water supply for energy production so we do not become dependent on other nations for energy as well as food production. Those are very, very vital parts of our future. Unfortunately, the function of water has been viewed most recently in the last 10 years as growing cities and protecting the environment, neither of which is sufficient. We need to work harder at developing plans for including those cri-

teria, the development of energy production and food production, into our water models.

There is no place we can go today to get a complete analysis of water and supply through the entire United States. We need to encourage all States to develop comparable plans to that that has occurred in Colorado and develop a national water atlas and a website so that people can identify where those are. We also need an optimization model for all decisions that are made by agencies.

Finally, it is vital that institutions like the Corps of Engineers and others that are reevaluating and reauthorizing water resources do so in a way that acknowledges these needs.

[The prepared statement of Mr. DuMars follows:]

PREPARED STATEMENT OF CHARLES T. DUMARS, ESQ., PROFESSOR EMERITUS, UNIVERSITY OF NEW MEXICO SCHOOL OF LAW, AND RESOURCE PLANNING ASSOCIATES, P.C., ATTORNEYS AT LAW

TOPIC 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, ecotourism, 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.

The CHAIRMAN [presiding]. John, thank you very much.

Our next panelist is Idaho Department of Water Resources, Idaho Water Resources Research Institute, John Tracy.

STATEMENT OF JOHN C. TRACY, DIRECTOR, IDAHO WATER RESOURCES RESEARCH INSTITUTE, AND THE IDAHO DEPARTMENT OF WATER RESOURCES

Mr. TRACY. Thank you very much for inviting me to present at this conference.

With the Idaho Department of Water Resources and Idaho Water Resources Research Institute, we were looking at coordination, not just an issue of physical infrastructure but also intellectual infrastructure. Many of the proposals that were selected for presentation in this session did discuss elements of this intellectual infrastructure: the importance of forums for discussion of information on water resources, collaborative decisionmaking models, platforms for sharing scientific information.

But one thing that I have seen lacking and I think needs to be resolved in the future is the issue of who is setting the research agenda for investigating new technologies and approaches to solving our water resources problems. In the past the agency that comes to the table with the funds has pretty much set the objective and has entered into a monologue with its partners. What needs to happen in the future is this needs to turn into a dialog.

Having a monologue has resulted in a variety of situations where approaches to solving water resources issues have been limited to a particular agency's or entity's vision, mission, and this has resulted in ineffective use of limited resources to create new solutions to our water problems.

If any additional resources are made available to address the water resources problems of this Nation, these resources must come with a new commitment to collaborative decisionmaking, especially at setting agendas of what approaches we are going to look at for solving our water resources problems.

This new structure must allow implementers of water policy, which are typically States and irrigation districts and water districts, to play a significant role in deciding what resource dollars we are going to invest into what technologies we are going to look at. This pretty much falls along the line of what the AWRA, the National Institute of Water Resources, and the University Council

of Water Resources have proposed, and that is developing regional-based consortia for directing research and development activities for water resources. I would strongly encourage any activities in the future to pursue this path.

Thank you very much.

[The prepared statement of Mr. Tracy follows:]

PREPARED STATEMENT OF JOHN TRACY, DIRECTOR, IDAHO WATER RESOURCES RESEARCH INSTITUTE, AND THE IDAHO DEPARTMENT OF WATER RESOURCES

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.

The CHAIRMAN [presiding]. Thank you very much.

We have American Water Resources Association, Gerry Galloway.

STATEMENT OF GERRY GALLOWAY, AMERICAN WATER RESOURCES ASSOCIATION

Mr. GALLOWAY. Thank you, Senator. It is a distinct pleasure to be here, and I want to thank you at the start for being the keynote speaker at our AWRA National Water Policy Dialogue. I would like to very quickly talk about the results of this dialog, which was held in Tucson last month and brought together 250 water experts, focusing on those things to deal with water coordination.

The dialog surfaced three issues of importance. First, the Nation's water users need to be addressed in an integrated manner, focusing not on a single project but on programs and on watershed and on basin level issues. The successful holistic efforts that are currently under way in evolving programs to restore the Everglades, manage the California Bay Delta, and to protect coastal Louisiana need to be replicated across the country.

Second, there is great need to reconcile the myriad laws, executive orders, congressional guidance that have created a disjointed, ad hoc national water policy and to clearly define our 21st century national goals. Many important laws were passed early in the last century when national objectives, physical conditions, and the roles of Federal and State governments were far different than they are today. Many of these laws are in conflict, placing Federal, State, tribal and local agencies in tenuous and sometimes very adversarial positions. Reexamination of these laws would eliminate some of these contradictions and confusion and certainly lead to far more effective water policies and policy implementation.

Third, given the fiscal realities facing the Nation today, there is need to more effectively coordinate the actions of Federal, State, tribal, and local governments, as well as with nongovernmental organizations in dealing with water. Directions for collaboration instead of competition among organizations will provide better and more fiscally efficient use of the scarce resources we are trying to husband and will assist in overcoming gridlock on key water programs.

These are the challenges, but there are also opportunities, opportunities for such things as a national water assessment as some look at a national water commission.

I want to thank you for the opportunity. I have a longer statement which I will submit to the staff.

[The prepared statement of Mr. Galloway follows:]

PREPARED STATEMENT OF GERALD E. GALLOWAY, AMERICAN WATER RESOURCES ASSOCIATION

PROPOSAL FOR: DISCUSSION TOPIC 1. WATER SUPPLY AND RESOURCE MANAGEMENT COORDINATION

IMPROVED COORDINATION OF WATER RESOURCES MANAGEMENT AT THE LOCAL, STATE AND/OR NATIONAL LEVELS: RESULTS OF THE NATIONAL RESOURCES WATER POLICY DIALOGUE

The Second National Water Resources Policy Dialogue (WPD II), held in Tucson, AZ on 14-15 February 2005, provided a forum for participants from all levels of government, as well as public and private organizations to discuss critical water resources challenges facing the Nation and the policy choices that need to be made to effectively deal with these challenges. The second dialogue was a follow-up to the First National Water Resources Policy Dialogue held in September, 2002 in Wash-

ington, D.C. Like the first dialogue, WPD II was national in scope, but because of its location, had a greater emphasis on western water issues.

Convened by the American Water Resources Association (AWRA), the dialogue was sponsored by nine federal agencies within the Departments of Agriculture, Defense, Interior, and Commerce, and the Environmental Protection Agency. In addition, 39 organizations representing a broad spectrum of water resources interests co-sponsored the dialogue. The dialogue was attended by over 230 persons representing a broad spectrum of government agencies, nongovernmental organizations, and academia.

Background: The Water Challenge

The growth and continued prosperity of our economy, the protection and security of our public health, and enhancement of our quality of life were made possible by past infrastructure investments that now provide municipal, industrial and agricultural waters, navigable waterways and ports, hydropower production, water-based recreation, sustainment of our natural environment, and protection from floods and hurricanes. The First National Water Resources Policy Dialogue held in Washington, DC in 2002, reported that the Nation faced serious water problems and conditions have not improved. Recent droughts have resulted in annual losses of over $5 billion and drought mitigation planning is moving slowly. Conflicts among States over water use and allocation are growing. EPA rates our coastal ecological and water quality conditions as fair to poor with no improvement over the last two years. More than thirty years after the passage of the Clean Water Act, beach closings abound. The States reported in 2000 that nearly 40 percent of out rivers and streams did not meet water quality standards and since then, EPA, because of a lack of State funding for monitoring, has questioned the reliability of even those assessments Floods losses continue to grow and approach annual damages of $6 billion and an average loss of 80 lives. The American Society of Civil Engineers continues to give sub-standard grades to our aging water infrastructure—ports, waterways, hydropower facilities, water and waste water treatment plants—and our efforts to protect rare and endangered species and restore ecosystem deficiencies seriously remain under-funded. Water is our most precious natural resource.

Dialogue Outcomes: Four Key Water Resources Challenges and Two Cross-Cutting Issues

The participants in WPD II identified four significant—and very much interrelated—water resources challenges facing the nation, noting the close link to similar challenges identified in the first water policy dialogue. Additionally, two issues—financing water resources improvements, and public education needs—run through all the challenges. Each challenge and cross-cutting issue is summarized below.

The four challenges:

1. *Promoting More Integrated Approaches. There is a need to address the Nation's water issues in an integrated manner, dealing not with single isolated projects but with programs and watershed-level problems. The cooperative and holistic efforts evidenced in the programs to restore the Everglades, deal with the California Bay Delta, and protect Coastal Louisiana need to be replicated across the country*. Participants generally concluded that integrated management is the key to effectively resolving water resources problems. Characteristics of integrated water resources management include using systems approaches and comprehensive GIS-based data to understand the connection between natural and man-made systems; analyzing water resources problems on basin or watershed scales; striving to achieve multiple goals and purposes using water resources in a balanced manner; and using collaboration across all levels of government and with all stakeholders to find appropriate solutions. Participants noted there are many obstacles to achieving integrated approaches. Those most frequently discussed include the following:

- The absence of a clear policy framework for making decisions about water resources
- The presence of multiple, often conflicting, agency mandates and priorities
- The lack of coordinating mechanisms and forums for dealing with differences among agencies, and among stakeholders
- The lack of adequate scientific data to permit basic understanding of complex physical and biological issues, and to facilitate good decisions

2. *Harmonizing/Reconciling the Current Ad-Hoc National Water Policy. There is a need to reconcile the myriad laws, executive orders, and Congressional guidance that have created the current disjointed ad-hoc national water policy and clearly define the 21st Century goals and values that should be met. Many important laws were passed early in the last century when objectives and physical conditions were*

far different. Many of these documents conflict with each other, placing executing federal departments in tenuous situations creating disharmony among states and localities. Participants felt too many conflicting goals and mandates are being pursued at the Federal level. Priorities are too often pursued in isolation and create needless conflict and gridlock. Participants called for clarification of roles and responsibilities among federal agencies, for establishment of a clearer vision for uses and priorities for the nation's water resources, and for the development of coordinating mechanisms to harmonize and reconcile policy differences before they lead to gridlock. Many participants believe that a national commission is needed to undertake the necessary recommendations for improving our current ad-hoc policy situation.

3. *Developing Collaborative Partnerships. The fiscal realities facing the nation underline the need to more effectively coordinate the actions of federal, state and local governments in dealing with water. Collaboration instead of competition will provide more effective and fiscally efficient use of scarce resources and assist in overcoming decision gridlock on key water programs*. The water resources decision-making environment is extremely fragmented and complex. It is marked by different laws and authorities to address different and sometimes conflicting purposes (water supply vs. drinking water treatment vs. endangered species vs. navigation, etc.), different levels of government with overlapping responsibilities, and a wide array of stakeholders with diverse values and view on water resources. In the absence of integrating mechanisms and problem-solving forums when conflict among agencies, governments, or stakeholders occur, litigation becomes the way of resolving differences leading to delays, lost resources, and limited ranges of options. Participants wanted to see all levels of government working in collaboration to achieve sustainable water resources solutions to critical issues. They noted that incentives need to be put in place by government to encourage greater cooperation among agencies. Dialogue participants strongly supported more partnerships and collaboration to create productive opportunities for resolving water resources issues:

- Integrate water quality and water quantity management—they aren't separate and shouldn't be treated independently;
- Establish/invigorate forums to resolve differences in federal agency policy and mission focuses and to deal with multi jurisdictional coordination, interstate, and cross jurisdictional water management issues;
- Cut across boundaries at all levels—encourage federal/state/local partnerships to address water resources comprehensively and in an integrated manner.
- Determine how best to assign the "lead facilitator" or "lead integrator" role in collaborative frameworks.

4. *Information for Sound Decision Making. The nation is blessed with access to a superb scientific capability and cutting-edge information technologies. These capabilities need to be focused on supporting water policy decision makers as they carry out their challenging responsibilities.* Participants at the dialogue concluded that decisions on the uses of America's water resources must be based on good science and complete information. Science and information need to be available to all stakeholders and responsible authorities so that decisions can be made in open, collaborative ways in a trusting environment. Many participants believed that information on water use, availability, water quality, and results being achieved in pollution control, as well as projections on water demand and use need to be better coordinated and integrated at all levels so that appropriate information can be marshaled for integrated water management and problem solving.

The two cross-cutting issues:

1. *Financing Water Resources Improvements. Our nation's water resources infrastructure—its ports, channels, flood control works, irrigation systems, water works, distribution systems, and treatment facilities—provides a foundation for our economic prosperity and quality of life. Yet funding for these vital systems is not keeping pace with the repair, replacement, and renovation requirements. There is a need for innovative cost-recovery, pricing, and financing mechanisms to address infrastructure funding needs.* Participants in the dialogue recognized that there are many competing national requirements for public funds. Many felt frustration that the water resources community has not done a good job of conveying the criticality of issues and the risks associated with continued under-funding of the nation's water infrastructure. Others pointed out that in the climate of fiscal austerity there has of necessity been greater prioritization, conservation, public-private partnerships, reliance on market forces, and other innovations in cost recovery and funding mechanisms than would probably have occurred if resources were plentiful. These innovations have been helpful; however, most agreed that additional funding for water infrastructure improvements must become a national priority. Some called for a na-

tional assessment as a means to comprehensively identify water resources needs and funding requirements.

2. *Educating the Public and Public Officials about Water Resources Challenges. Much of the public at large and many public officials lack an understanding of the water resources challenges facing the nation. An education program must be conducted in parallel with efforts to address the nation's water resources challenges.* Participants continually stressed the need to better educate/inform the public as well as decision makers in local, state and federal governments about the conflicts and limitations associated with water availability and use. Topics in need of coverage include: the value of water, real cost of water, environmental consequences of use, trade-offs associated with different uses, importance of balancing needs and uses, availability of supplies vs. demands, risks associated with an aging infrastructure, importance of regional solutions to water use, long-term consequences of unwise use, and impacts of political/jurisdictional decisions/differences.

Calls for Action

Congress and the Administration were called upon to provide the leadership for achieving the needed direction suggested by the key challenges and cross-cutting issues. Repeatedly mentioned by participants in this vein were the following actions:

- *Develop a national water vision*: Working with all levels of government and the private sector, lay out a framework for the future for water resources; address competing goals and objectives, and establish broad priorities for resource expenditures.
- *Formulate policy principles for translating the vision into action*: Focus on shared responsibilities at all levels of government, as well as the private sector for addressing our water resources challenges in an integrated, holistic, and cooperative fashion.
- *Insist that appropriate coordination and cooperation takes place*: Federal agencies must work together more collaboratively, and with other levels of government about water resources issues.

Main Conclusions

On balance, WPD II had a hopeful tone. Participants and panelists all acknowledged that the nation is facing a wide array of daunting water resources challenges—making adequate water available for economic growth and other needs, allocating water to competing uses, maintaining and improving water quality, rehabilitating an aging water infrastructure, balancing economic needs for water with ecosystem requirements, etc. However, the watchwords of the first national water policy dialogue—*integrating efforts, building partnerships*, and *addressing problems in a comprehensive manner*—were much in evidence as participants described successful and innovative solutions to pressing water problems. A key conclusion, from WPD II then is that the themes and recommendations for responding to water challenges put forth in the first dialogue are working and need continued support and nurturing.

The Second National Water Policy Dialogue was a significant event that can help propel the United States forward to confront serious water resources challenges. The first and second dialogues have made a good beginning, but next steps are crucial to sustaining the progress achieved. National groups like the AWRA can continue the dialogue, and agencies can improve efficiencies and inter-agency cooperation and collaboration, but improving, harmonizing and reconciling the troubling and difficult policy issues we now have will require Congressional and Administration action.

The CHAIRMAN. Thank you very much.

Now, we are on schedule. These witnesses are available if anybody wants to ask them or if any of you do.

Let me yield to any Senator that might have a question. We have additional panels, but you are surely welcome to ask.

Senator Smith.

Senator SMITH. Mr. Underwood, what would it take for desalinization to be cost effective in more coastal areas?

Mr. UNDERWOOD. There is two areas that you look at, I think, in terms of desalting. One is energy and the other is pretreatment that determines the cost on desalting. The other aspect is, if you look at desalting just from saline water or are you looking at it from brackish water or urban water? So those alone—if you are

looking at how to recycle more urban water, it allows you to do it at a reduced cost. But it is attaching the pretreatment, looking at the pretreatment and the energy, making it more practical, make it more cost effective.

Like I said, it is applied not just to saline water bodies, but we should look at other water bodies that we can potentially include within the water supply, recover it into the water supply.

Senator SMITH. Is it proceeding? I mean, is this going on or is this being studied?

Mr. UNDERWOOD. I think there is a lot of efforts. At Metropolitan Water District we encourage—a lot of times we will do things through incentives. We will pay so much money per acre-foot to help buy down the cost. But that is not the long run. You cannot just be buying down the cost.

You are making those investments so that the research will make it more practical and more cost effective, and it is going on.

Senator SMITH. On another subject, is California taking a comprehensive look at all the environmental impacts of all of its water transfers?

Mr. UNDERWOOD. Say that again?

Senator SMITH. Is California taking a comprehensive look at the environmental impacts of all of its water transfers?

Mr. UNDERWOOD. If you look at where the water hubs are in northern California, one is the Sacramento, the Bay Delta area, and that is being addressed in terms of restoration. If you look at the Colorado, like I mentioned earlier, the lower Colorado, that is going under a multi-species program which was just signed that looks at 27 species, provides for existing and future operations, but most importantly it also provides for the conservation of the species.

Senator SMITH. Thank you.

Tom Davis, I agree with you on the need to maintain agriculture in the West. Does the efficiency of water use vary throughout the West and how much from State to State?

Mr. DAVIS. Efficiency in water use varies I think from every irrigation district to irrigation district. One thing we need to keep in mind with water efficiency or water conservation, particularly in the use of surface water in areas where conjunctive use of surface and ground water exists, oftentimes conservation can be carried to the extreme to where it might impair downstream surface diverters who might be senior.

Senator SMITH. In what way?

Mr. DAVIS. I will give you a good example that exists on the Pecos River in New Mexico. The Pecos is largely supplied by underground discharges from aquifers that are under pressure and as the years went by and those aquifers were tapped for irrigation, it was flood irrigation. A lot of return flow occurred from that flood irrigation to the river and it supplied the diversion for downstream senior diverters, which once before the wells were drilled were supplied by the aquifer discharges. Now they are supplied by the wells being the return flows from the irrigation.

As more and more efficient irrigation is applied there, such as the new LEPA systems, that is very good for areas like the Ogallala Aquifer where you are mining an aquifer, but in this case,

where there is an intricate balance between the aquifer and the surface flows, as you become more efficient in applying your water from the underground wells there is less return flow. So in effect, water conservation is impairing downstream diverters' supplies.

So it is not a real clean—conservation is not a real clean-cut situation. It has to be looked at in each individual case to really understand what is workable and what is not.

But yes, all agriculture use should be applied as efficiently as possible without impairing downstream diverters.

Senator SMITH. So are they going back to flood irrigating or are they——

Mr. DAVIS. We are waiting for the State engineer to sort that out.

Senator SMITH. Obviously, how they irrigate and how States use it depends on the soil, the crops and everything they are using. But your point is very well taken, that it is like squeezing a balloon. You blow it up somewhere else, I suppose.

Can you identify for me any Federal programs or what Federal programs are most effective at helping farmers use waters efficiently?

Mr. DAVIS. I think for sure traditionally in the West the Bureau of Reclamation has had the greatest involvement in developing the projects and in being a source of knowledge for districts to improve their use of water, to become more efficient in measuring water and applying water to the land. Obviously, a lot of irrigation districts have grown beyond that because of demand. We realize that if we become more efficient water can be used in other ways and can be used through drought periods.

I think some of the farm programs have been very helpful in the past. In the area that I am familiar with, most of the benefits from those type programs have been reaped, have been used. I am not sure that additional benefits are out there to the extent they once were for individual farmers to make improvements, such as laser leveling or concrete lining or installing more efficient delivery systems. I think most of that has been done.

But those projects in the past, the Great Plains Project and the Equip Program, have been very helpful. I am not sure there is a lot of good left in those.

Senator SMITH. And they are done. I mean, they are already accomplished.

Mr. DAVIS. Most of that work has been done, and would not have been done without those programs.

Senator SMITH. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Bingaman.

Senator BINGAMAN. Thank you very much.

Mr. Galloway, you talked about the need to have a new look at all of these complex water laws and the disagreements among them. Back in the 1960's the Congress legislated into being a thing called the Public Land Law Review Commission that had the job of looking at all the public land-related laws and trying to make sense out of them and then make recommendations. Would you think it would make sense for us to have a Public Water Law Review Commission that would do the same thing with regard to the water laws? Do you have any thoughts on that?

Mr. GALLOWAY. Yes, sir. That is certainly a minefield, as water law is evolving. But it does point out the challenges that you face today. In the dialog there was clear concern over the variety of laws and the change of the laws that are taking place to meet the new challenges, the issues that have just been raised by Mr. Davis.

So there is a need for somebody to come together and bring that together. If it could be done on a regional basis in some cases, that might be very useful. Clearly, the need for a look at how all of the national water laws fit together is something that the dialog found to be very important.

The CHAIRMAN. Senator Bingaman, would you yield?

Senator BINGAMAN. Sure.

The CHAIRMAN. I think maybe we ought to ask all of you a similar question to what Senator Bingaman asked of you. Could you answer the question as to whether you think a national resource commission, national water commission to examine the water issues, should be established? I think the AWRA recommended that?

Mr. GALLOWAY. Yes, sir. Our letter to you and to the President, the Speaker, recommended that there be a national water commission to examine not only the water laws themselves specifically on the use of water, but the entire issue of how these laws fit together.

Senator SALAZAR. Mr. Chairman.

The CHAIRMAN. Senator.

STATEMENT OF HON. KEN SALAZAR, U.S. SENATOR FROM COLORADO

Senator SALAZAR. Just as a footnote to the chairman's question to all of you, here is what I would ask you to focus on as well. I was on the National Water Commission along with my good friend John Echohawk, who I see in the audience, back in the 1990's. Frankly, I think that was a lot of time and a lot of expense and in the end it amounted to nothing. So sometimes when they see us getting together in these water summits or water conferences, I think that we end up launching off on doing studies and forums and ultimately do not get to any kind of result.

So as you answer the chairman's and Senator Domenici's and Senator Bingaman's question, I would like you to reflect, if we do move forward with some kind of a national water commission or forum, how do you make it effective so we do not repeat the mistakes of the past?

The CHAIRMAN. Very good.

Senator Bingaman, you led off.

Mr. GALLOWAY. I would just comment, Senator, it needs to be very focused. It needs to be founded on good science. We have not had a national water assessment in nearly 30 years. To get some science behind some of the decisions that are being made, and it cannot be all over the place. It has got to be focused, and I think that is the worry, that it would go too far.

The CHAIRMAN. We will go around the table if you have a comment. If you do not, you do not have to.

Mr. TRACY. No, I do have a comment on this. I think it is a real good point, and I think to make it effective what we would have to do is avoid the top-down philosophy. That is that the national

water commission I would not see as having a role of leading anything, but rather facilitating, and all of these would have to be done on a very regional basis and probably a large watershed basis. So you would have one for the Snake, one for the Columbia, one for the Colorado. And that they would focus, as I think Mr. Davis had pointed out, in a very regional fashion, where the expenditures of the study dollars, the direction that the studies would take, would be in essence the authority that would be held at a regional basis, which would actually be a collaboration between Federal, State, irrigation district, water district, that really had teeth in it.

Then I think you would find it effective, where the Federal water commission would be nothing more than an organization to help facilitate those studies.

Mr. DUMARS. I concur with what John said, but I also concur with what Senator Salazar said, that these national commissions and big long reports can just gather dust. But it really would be useful if we could focus energies on management of water on the watershed or common aquifer basis, and within those watershed regions have the States produce their part of the plan. We have got the water resources research institutes at the universities who could be coordinating the State engineers to create the study.

But I think it is important that the product be clear from the beginning, that it is not just an abstract discussion of what is out there. Rather, it ought to be focused, what would be some things that could be done to make things better. Those things would include in my view an accurate analysis of all of the demands for the water, and including in that demand analysis, as I said in my earlier remarks, include demands that are more than just current topical or popular demands, like growing cities and keeping water in streams, but long-term support of agriculture, long-term support of energy development, so that you had a set of end uses that you would define for the region and a set of processes, but the net result would be a cohesive regional description of that watershed and that basin which could then become part of a water atlas that people could access on the web. I think that would be very useful and the laws would naturally integrate in there.

But I think most people—certainly I think I am aware of most of the water laws in the Western United States, but that does not make me an expert on the institutional problems that you face at the regional level. So I concur with John as to its content.

Ms. BIRNBAUM. I am actually torn over the answer to this question, because, as our submission actually to this conference indicated, there was a terrible split, kind of represented by Senator Smith's chart, among the different jurisdictions of committees, different agencies doing different pieces of water policy, an artificial dichotomy between water quality and water quantity, which really cannot be split.

It would be wonderful to have somebody come down and do a real national review, but it is an enormous, incredibly complex problem, and it instantly leads me to Senator Salazar's question: How do you focus it and how do you make it effective? I just do not know how you can define it in a way that will actually produce an effective result.

If what you want is an assessment of demand and a fairly accurate projection of demand, you can do that. That is a very limited piece. But a very broad commission to try to look at everything we are doing with water policy would be an enormous challenge. Even the Western Water Policy Review Commission was only a narrow piece of the puzzle and it came out with recommendations that have yet to be acted on.

The CHAIRMAN. Go ahead.

We are not taking your time, Senator Bingaman.

Ms. KASSEN. As a Coloradan, I agree with the good Senator from Colorado that we do not need another national policy commission to set Federal water law policy, in part because, as all of you gentlemen know, the allocation of water is done at a State level. So one of the reasons that the Western Water Policy Review Commission, some of those recommendations have not been enacted, is that it would be complicated and it would get into areas where the States see that they have jurisdiction.

That said, I do think that there is a role for the Federal Government and maybe, Senator Salazar, if you think about technology development and research and environmental values, one of the things that the experience that we had in Colorado with the SWSI showed is that local planning is pretty good, but there are some gaps and we do not have enough information about which environmental values absolutely need to be protected, how much water is necessary to do that, how we get to where we need to be.

From that standpoint, I do think that Federal resources would help solve some of the gap problems, not just the gaps in terms of ensuring that growing cities have what they need, but also the gaps in terms of how do we satisfy the environmental needs, how do we protect the remaining fisheries that are out there.

Thank you.

The CHAIRMAN. Thank you very much.

Tom, you are next. Could we try to make them brief now?

Mr. DAVIS. I will try to be as brief as I can be.

I think Federal dollars are spent, better spent, other places. I think a lot of this knowledge is there. We have interstate river compacts on every river in the West, and obviously the States have a role of allocating the water in the States and within each State. I think the Federal funding should look more at developing technology similar to what is being there on the desal plant that is going in at Alamagordo, New Mexico. I think those are the type projects that maybe the Federal dollars should look toward, overall technology increases that will help all of us.

The CHAIRMAN. Mr. Kuharich.

Mr. KUHARICH. Mr. Chairman, the Statewide water supply initiative identified three key findings and all three of them had a Federal nexus. The first one had to deal with Federal funding. Federal and State funding was going to be necessary in order to meet some of the supply gaps that were going to develop between now and 2030.

The second one was permitting. Permitting was identified as one of the primary implementation hurdles to any water supply project.

The third one was the issue of environmental and recreational demands for water, which are growing in Colorado, I think as with

all Western States. There the problem is one of cost. Once you mitigate the project, if there are any other enhancements involved environmental or recreational uses have no way of generating the revenues to pay for those enhancements.

The CHAIRMAN. Thank you very much.

Mr. Underwood.

Mr. UNDERWOOD. I think there is a need to have a national energy—national water strategy. They all go hand in hand, I guess. Water strategy, primarily looking at how do you direct the research, how do you direct the new technologies, is precipitation management viable for the United States, is vegetative management a viable tool.

So some of these, if you look at a national energy strategy, you are advancing things, the tools that can be used by individual States or in the river basins. Assessments or looking at integrated planning, I do not know so much about assessments, but I would look at the integrated planning, not so much the assessment within an area but how do you—what is the best approach that you should be using for river basins or regions as a whole.

The CHAIRMAN. Thank you very much.

Senator Bingaman, if you want to follow-up.

Senator BINGAMAN. Let me just ask one other question, Mr. Chairman. My impression is that when we talk about coordination of water management and integration of water management, one area that we all know exists, but I think has gotten way too little attention, is this whole issue of the mining of underground aquifers. You go State to State, each State has a whole different set of rules either governing this or not governing this.

For example, Texas has a whole different set of laws. They have no limits on underground mining, mining of underground aquifers. We have major limits in New Mexico. When you bring the subject up and say, what are we doing about the depletion of the Ogallala Aquifer, people say: This is a States' rights issue. Well, at some point we are not going to have any water on the New Mexico side because we have allowed Texas to pump it all out. I do not know that it is going to be an adequate explanation at that point to say that was a States' rights issue.

I think the same thing on transboundary water or transboundary aquifer assessment that we are trying to get done on the U.S.-Mexico border. Some way or another we need to start looking at the underground resource and recognizing that we are not fighting about what is coming down the river near as much as we are fighting about what is being pumped out of the ground.

I do not know the extent to which any of those issues are getting addressed. My sense is they are not getting addressed very effectively. Chuck, maybe you have some thoughts on that. Go ahead.

Mr. DUMARS. I think they are not being addressed effectively. They are being addressed on a State by State basis with different degrees of interest depending on the State. But as I said in my statement, there is an unavoidable analogy to our oil reserves. When you mine ground water, it is gone, and I think that there is no place that we have tried—I personally have worked in the Juarez-El Paso area for years and worked on draft compacts, international compacts for ground water mining legislation or parallel

legislation. It is now at a crisis point in the frontera, in the border there, and it is now—in the Ogallala and other places we are now faced with a choice, are we going to save water for future generations or not?

When it becomes national in scope, I think there is a national interest there in making, facilitating agreements that reach consensus on how we treat these aquifers.

Senator BINGAMAN. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Well, I want to just make a point and if any of you want to comment that would be fine. Then I will yield to any other Senator.

I keep hearing use of the words, words like we need to develop technology, the technology of producing good water from saline, cleaner water from water that has pollutants in it. I think that is one of the big things we could address. I am of the opinion that the Federal Government could set up some centers of technological excellence with reference to the application of science and technology to various water problems.

We are going to try that this year and we will try to extract a little additional testimony from some of you on how that might work. What we were thinking about was maybe four centers in the United States built around a national laboratory and a university, with private sector input, a certain amount of dollars, managed in some way so that everybody was working toward the same goals, maybe some duplication but to disadvantage the idea of everybody doing the same thing, which we tend to do in research.

Do any of you have a feeling about that kind of thing as an idea? And then I will yield quickly to the other Senators. Anybody?

Mr. Underwood.

Mr. UNDERWOOD. I think it is a good idea, because you cannot do all of the research in one area. A lot of it, you may even have—you are going to produce a solid or a sludge that you are going to have and so you have the disposal of the byproduct of even the improved water treatments. But water treatment, if you look at cleanups, if you look at meeting the Safe Drinking Water Act, you go through the recycling, etcetera, all of those have a water treatment component, and what we are trying to do is how do you reduce that cost to make it more effective.

But when you do that, when you remove something, then you have to dispose of it. So I think you need to do the adequate not just on the treatment itself, but on the disposal.

The CHAIRMAN. John.

Mr. TRACY. Yes, I think that is a very good idea, and I think the regionalization of the research centers is very important because of the different physical circumstances that exist in the different regions that are water-short, especially in the Western United States, and having some type of technological centers where you have a combination of the State, the universities, Federal agencies, would really be a good focus for directing the activities.

The CHAIRMAN. Yes?

Mr. KUHARICH. Mr. Chairman, briefly, I think it is important to separate out the water policy, which has traditionally been a States' rights issue, from water research, which I think can benefit everybody.

The CHAIRMAN. Okay. Any other Senators? Yes, Senator Salazar?

Senator SALAZAR. I have just a quick question and that is—before I do that, let me just say to Rod Kuharich and to Melinda Kassen, welcome here to Washington from Colorado and thank you for the good work that both of you do back there.

My question is to Dennis Underwood and to Rod. That is a question about transfers of water from agriculture to municipal uses. I think for all of us, especially in the West, what we see happening in many of our States and our communities is that you have agricultural communities that are devastated when you have water moving to the economic uses that can afford to pay the much higher dollar.

I know that MWD in southern California has been undergoing some agreements with the agricultural community that has been good for the cities and has been good for agriculture. Rod, I think some similar things are under way in the State of Colorado and I would like you to briefly just comment to the panel on some of these sharing arrangements, because at the end of the day, especially for those of us from the western part of the country, we know that 90 to 95 percent of our water is consumed by agriculture.

So one of the opportunities is how can we enhance our water supply for municipal and other uses, but at the same time keep from devastating rural communities that are dependent on water supply for agriculture?

Mr. KUHARICH. Thank you, Senator. That was not a plant. It was a great question.

The Statewide water supply initiative addressed this head-on. I think, to be blunt about it, if it is not new water it is going to be ag water for development in Colorado. One of the things we are facing which we identified is the need to develop our unused compact allocations throughout the State, but also to work with agricultural water in some sort of a cooperative arrangement where we could get ag fallowing, where there could be reliability to municipal providers as well as economic security to the ag communities that remain viable through the process.

I think you will find that Colorado will be moving toward an idea like this probably as early as this summer, to try to come up with projects and processes that are a win-win for everybody in the State.

Mr. UNDERWOOD. We have had quite a bit of experience in ag to urban transfers. What we try to do is really make it an effective partnership. You are not changing water rights, you are not changing land ownership, you are not losing prime agricultural lands. You are doing it in a partnership.

Ag is facing, just like the water community, is facing a lot of competition from the world down under. A lot of our growers in California used to be able to control the markets because of the wintertime, etcetera. But now the world down under competes with that and so it is a harder life for them, too.

So there is a way of putting together partnerships that become effective without changing and losing prime agricultural land. I will give you a few quick examples. Whether you are doing on-farm improvements, are you doing system improvements, are you doing long-term fallowing programs which allow for some crop rotation,

some lands that go out, that come back in and are more productive than when they went out? You are looking at some even where we have actually purchased some lands and then leased them back to farming.

You also have 1-year water supply options. So there is a variety of partnerships you can do with agriculture. Yes, agriculture is one of the larger amounts of water that is available, but you also need to sustain American agriculture. So there are ways of doing both.

The CHAIRMAN. Thank you.

Any other Senators?

Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

I am sorry to all of you that I have missed the testimony and I wish that I had had a chance to hear some of the comments.

The question that I have relates to whether or not we are at a point where we need to consider a national strategic water reserve similar to what we have with our petroleum reserve. When we recognize the vulnerability that we have as a Nation, we think about things like oil. But think about what happens when our water supply is threatened. Do we need to—are we at that point where we have to have that discussion, that conservation?

I do not even know who to throw this out to, but your comments?

Mr. DUMARS. Well, I talked a little bit about that in my testimony. What I suggested was—I am Chuck DuMars from New Mexico—was that the States at the State level—States are beginning to evaluate their own reserves and make choices about how much they are going to need for future generations and looking at their mined aquifers and so on, and there has been some testimony and discussion about the fact that I think it is clear that the States are moving and that each State is moving in that direction or needs to be encouraged to go in that direction, in order to make sure we do have water reserves for our energy production and for agricultural production.

I think that the States are evaluating that and looking at that. We need to do that more. So I concur with your suggestion that we need to evaluate the resources.

But what my testimony was was that I thought that the States need to be encouraged to do that more and they are beginning to look at that more, but over the next 10 years there is going to be a crisis if we do not maintain water supplies for our agricultural and energy production, at the same time understanding what our environmental needs are and trying to meet those needs.

Senator MURKOWSKI. Well, certainly from a State like mine in Alaska, where we have incredible water reserves, we are sitting okay. We can take care of most of our needs. But in some of the Western States where we know we have critical shortages, it may not be so easy to look toward the future and figure out how you are going to produce that reserve.

So I appreciate your State analysis. I am just wondering if from a national perspective we need to think about that.

Senator THOMAS [presiding]. Could we go forward now?

Senator MURKOWSKI. She has got one comment.

Ms. BIRNBAUM. I just wanted to add one thing. Actually, from New Mexico also, the State of New Mexico just passed a law to cre-

ate a strategic water reserve and the purpose of that water reserve was to meet the State's needs both for compact purposes with Texas and to maintain adequate in-stream flows for endangered species.

One of the things that States are looking at in terms of having a water reserve is making sure that they also have enough water in rivers to maintain river ecosystems at the same time that they meet all their uses. But New Mexico just passed a bill on this.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Senator THOMAS. Thank you.

Thank you very much. I appreciate it and we are ready to call our next panel. While they are being seated, let me say this is called the "Future Role of the Bureau of Reclamation." The Bureau was established in 1902 to help develop and settle the arid West through irrigation and multiple use projects. Over 100 years later, the West is largely settled, its population booming. Agriculture, urban, and environmental needs now compete for a limited, sometimes overallocated, water supply.

We have heard from our panelists that the Bureau is faced with significant challenges, such as the impact of environmental requirements on project operations, increasing demands for non-agricultural uses such as M&I purpose and ecosystem recreation uses, aging water infrastructure and new security needs and funding for new projects.

The question for this panel: What should the Bureau's role be in the 21st century? So as soon as we get settled here, we will go forward.

Since my voice is not very good, would you give us your name and whom you represent, please.

Mr. SEMANKO. Mr. Chairman, my name is Norm Semanko. I am with the National Water Resources Association.

Senator THOMAS. Thank you.

Mr. ATWATER. My name is Richard Atwater and I am with the WateReuse Association.

Mr. TYRRELL. Senator, my name is Pat Tyrrell, Wyoming State Engineer, and I am here today invited by the Western States Water Council.

Senator THOMAS. Good. I recognize you.

Mr. KEPPEN. Senator, my name is Dan Keppen. I am the executive director of the Family Farm Alliance. I am from Klamath Falls, Oregon.

Mr. BULLER. Mr. Chair, Senators, my name is Galen Buller from the city of Santa Fe—I am sorry. Mr. Chairman, I am with the city of Santa Fe, Water Division director.

Mr. GEORGE. Senators, I am Rick George and I am with the Confederated Tribes of the Umatilla Indian Reservation in Oregon.

Senator THOMAS. The other side has gotten a little smaller, I noticed.

Ms. BACH. This is pretty comfortable odds, I would say. I am Maryanne Bach. I am the Director of Research and Development for the Bureau of Reclamation.

Senator THOMAS. Very well, and now the chairman has returned.

The CHAIRMAN. Thank you very much.

Let us proceed. If you will start, Norm, and we appreciate it very much.

STATEMENT OF NORM SEMANKO, ON BEHALF OF THE NATIONAL WATER RESOURCES ASSOCIATION

Mr. SEMANKO. Mr. Chairman, members of the committee, thank you. It is my privilege to be here and thank you for providing this leadership in looking at water issues from a national level.

The National Water Resources Association strongly suggests that our good partners for many years in the Bureau of Reclamation have a strong and legitimate role well into the foreseeable future. We have four primary suggestions in that area.

No. 1, the first and highest priority in dollars and human resources should be directed to the efficient and effective operation of existing projects in such a manner as to honor existing commitments and provide authorized benefits in a safe and reliable manner. We think this is consistent with the current Commissioner, John Keyes', direction to his staff and we think that should be continued.

The basic operation and maintenance and safety of impoundments is essential to ensure that the authorized purposes and benefits of existing infrastructure continue in an effective and efficient manner.

Second, Congress should clarify, reaffirm, Reclamation's relationship to the States, the longstanding responsibility for allocating water resources within their jurisdictions consistent with interstate compacts and decrees, by affirming again its longstanding policy, Congress's that is, of deferring to the States with regard to allocation and administration of water rights. This is reflected in section 8 of the current Reclamation Act and again should be reaffirmed.

Third, with regard to aging infrastructure, there are many projects that have met or exceeded their design life, having been around for 100 years in many cases. They are in need of modernization. Currently the Bureau does not have a program in our view which enables water users to rehabilitate their projects and pay off those costs over a reasonable period of time. Such costs are currently considered operation and maintenance costs and consequently must be paid back in the year they occur. This is a problem that if not addressed will result in severe consequences in the decade ahead.

Finally with regard to future development, few of us envision a future infrastructure development program and financing arrangement like the original reclamation program which facilitated the development and economic growth of the West, but it is time to recognize and address a new generation of infrastructure development needs and financing realities for the growing part of our country.

An essential element is a basin by basin needs assessment of authorized but unfunded projects and projects in the planning stages. This assessment cannot be developed without the active involvement and leadership of western Governors, water resource professionals, and State and local officials.

With that, Mr. Chairman, I have provided a copy of our written comments to the staff. Thank you.

[The prepared statement of Mr. Semanko follows:]

PREPARED STATEMENT OF NORM SEMANKO, ON BEHALF OF THE NATIONAL WATER RESOURCES ASSOCIATION

ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY

Historical Perspective

The nation as a whole has come to take for granted the benefits that flow from the omniscience and vision of the policy-makers who, at the beginning of the 20th century created the federal/non-federal partnership that settled the West—The Reclamation Program. Reclamation projects authorized by Congress continue to provide numerous and substantial benefits for the entire United States.

The Reclamation program was initially enacted with the passage of the Reclamation Act on June 17, 1902. Essentially, the Reclamation Act provided for the proceeds from the sale of public lands in 16 western states to be deposited in a fund (the Reclamation fund) to be used for the ". . . construction and maintenance of irrigation works for the storage, diversion, and development of waters for the reclamation of arid and semi-arid lands in the said States and Territories . . ." It was one of several acts concerning the transfer and development of public land in the Western United States. The Reclamation Act is bound up with these other laws concerning the allocation, transfer, and use of the nation's public lands. The exploration and settlement of the west became a matter of great national interest in the latter half of the nineteenth century.

As the Reclamation program changed throughout the early part of the twentieth century, the combination of a simple message, clear vision, and great leadership remained intact. In less than 40 years, the Reclamation program evolved from single purpose irrigation projects, funded by a revolving fund, with 10 year repayment periods, to complex multi-purpose projects, funded by appropriations, with 40 year repayment periods, and power revenues assisting in the repayment of irrigation debt. Given these significant program changes, the program message continued to be that of "making the desert bloom," and the basic purpose continued to be to promote regional economic development by developing irrigated agriculture. The Reclamation program stayed on this course until the late 1960s.

The Reclamation Program is vitally important to the West and the Nation as a whole. Reclamation projects authorized by Congress provide numerous and substantial benefits for the entire United States. Among these benefits are: (1) flood prevention and protection totaling in the tens of billions of dollars; (2) generation of substantial amounts of hydroelectric energy using water as a renewable no-cost fuel source; (3) delivery of irrigation water to hundreds of thousands of acres of farmland in semiarid and arid regions that has increased and stabilized agricultural production in those regions; (4) water-based outdoor recreation facilities that provide recreation for millions of visitors annually; (5) municipal and rural domestic water supplies for over 30 million people; (6) recharge of underground aquifers and water supplies; (7) fish and wildlife habitat including new fisheries, wildlife management areas, and hundreds of thousands of acres of habitat and marshes throughout project distribution systems and facilities; and (8) major surface water transportation.

MISSION OBFUSCATION

Reclamation has never had a comprehensive Organic Act describing its mission, much less recent revisions reflecting the evolving needs of the west (unlike the National Park Service, the Bureau of Land Management, and the Forest Service). Rather, its role and associated authorities evolved through a series of individual project acts; many Reclamation administrative acts concerning such matters as contracting, financing, and general administration; the overlay of federal environmental law; the waxing and waning of the federal commitment to Indian programs; legal interpretation by Interior's legal staff, as well as the courts, of the many, varied, and sometimes inconsistent federal statutes associated with the Reclamation program; and the direction provided by its own internal assessments and policy directives. The absence of an organic act results in less clear Congressional direction and contributes to the difficulty of providing consistent program direction.

During the 1960s, three issues began to impact Reclamation's "mission" bringing focus to this lack of Congressional direction. The first was a gradual reduction of strong Congressional leadership on water issues. Members such as Senator Hayden and Congressmen Aspinall, Johnson, Sisk, and Moss left office in the '60's and '70's. The Reclamation program had fewer strong champions in the Congress and less standing in the Department of the Interior. The second had been a concern throughout the Reclamation era and involved questions of the economic justification for fur-

ther federally funded Reclamation project development. The third issue concerned the environmental impacts associated with Reclamation program activities

Reclamation's construction program was dropping off significantly, and the planning program was moving away from traditional water projects. Funding for the loan program was reduced and, ultimately, virtually eliminated. Several projects were re-authorized (Garrison, Central Arizona, Central Utah, Central Valley, Truckee Carson, etc.) to reflect emerging fiscal, environmental, and/or Indian interest resulting in a piecemeal widening of Reclamation responsibility. This change in legislative direction by the Congress added credence to what many in Reclamation viewed as a change in public interest associated with the Reclamation program. Further, Reclamation's power marketing and transmission program was transferred to the newly established Department of Energy in the late 1970s.

From the 1930s to the 1970s, the power and construction programs provided the funding stability required to run the Reclamation program in the traditional manner. As these program functions were transferred or significantly reduced, Reclamation managers found it more difficult to support the historic organizational arrangements. Overhead costs began to go up significantly. With a greater interest in cost recovery, these cost fell, to a greater extent, on the largest remaining program: operation and maintenance of exiting projects. Since O&M cost are recovered from the water and power users in the year they are incurred, this drove up costs to customers, creating another problem for Reclamation and its user community.

Lacking clear Congressional direction on its mission in the form of an organic act or some other form of overall policy guidance, and recognizing all of these changes and the resulting effects on program management, Reclamation's leadership went through a series of internal assessments with resulting policy documents. These reviews and documents include:

- 1987 Assessment
- 1988 Implementation Plan
- 1992 Strategic Plan
- 1994 Blueprint for Reform
- 1997 Bureau of Reclamation Strategic Plan, 1997-2002

In 1997, Reclamation published its five-year Strategic Plan pursuant to the Government Performance and Results Acts of 1993. The plan states three mission objectives:

1. Manage, develop, and protect water related resources.
2. Protect the environment.
3. Improve our business practices and increase productivity of our employees

The objectives are supported by 18 strategies and five-year goals associated with each strategy. (*Interestingly enough, contract renewal, which is a near-term vital interest to many Reclamation project water users, is not even mentioned in the Strategic Plan.*) The Strategic Plan states broad objectives and numerous sub-objectives (strategies), and includes ambitious five-year goals. The five-year plan includes Reclamation's historic mission regarding facilities, operation, maintenance, and dam safety. It incorporates environmental protection as a fundamental mission of Reclamation. In many ways, it commits Reclamation to being all things to all people, as it pursues its mission and mission objectives.

The five-year Strategic Plan basically says that Reclamation will continue its traditional activities, but with equal emphasis on environmental protection and remediation. Recreation and Indian Trust responsibilities are further emphasized as Reclamation objectives. The problem is that there does not appear to be agreement in Congress or among Reclamation project water users that 1) this is Reclamation's future mission, or 2) this mission is being carried out at this time—or can be carried out in the future-in an acceptable manner.

Given the significant additional responsibilities in the environmental area imposed by the Congress, the renewed attention to tribal obligation and the shifts in policy direction and institutional change over the past 10 years, it is no wonder Reclamation is struggling for a clear sustained direction. Reclamation can accommodate adjustments to program direction from year to year and remain effective. It has demonstrated this over the years. However, direct and sudden reversals of program direction and organizational philosophy have had a profoundly negative effect on the organization. A 20 percent reduction in staffing and a loss of historical leadership and institutional knowledge has also contributed to Reclamation's instability.

ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY

Reclamation's "mission" has become so blurred over the past twenty-five years that it is important for Congress to consider a system of priorities for funding of

the Reclamation's many programs. We believe it is time for Congress to bring some clarity to the future of the Reclamation program. There are several possible directions the Reclamation program can move in the immediate future.

We strongly suggest that there is a legitimate role for Reclamation into the foreseeable future. Reclamation manages over 350 high dams in the west. Some agency needs to be administratively responsible for the operation and maintenance of these facilities. Until—and unless—they are transferred out of federal jurisdiction, this seems an important and legitimate role for Reclamation.

Reclamation's history is entwined with the development of the West. That development goes on today at an unprecedented rate, and is placing significant pressure on a finite water supply. Ideally, Reclamation should have sufficient resources to support the states by performing the full range of functions that diverse western water interests are demanding today. Regrettably, recent history has demonstrated that fiscal and human resources are not unlimited. Therefore, the Reclamation must focus its limited resources on priority projects and programs. The following priorities are proposed:

- The first and highest priority in dollars and human resources should be directed to the efficient and effective operation of existing projects in such a fashion as to honor existing commitments and provide authorized benefits in a safe and reliable manner.
- The second priority should be the timely completion of ongoing construction so authorized benefits can be realized within a reasonable time frame. This includes pass through funding associated with authorized construction projects currently underway.
- The third priority should be the funding or execution of new activities or projects to provide expanded beneficial use from existing facilities in response to increasing demands being placed on western water resources.
- The fourth priority should be funding and execution of innovative new projects or activities.

The first priority is directed at protecting the existing federal investment and honoring existing commitments by assuring the uninterrupted and undiminished flow of authorized benefits from existing projects. As long as the federal government insists on retaining title to these project facilities, it must place their operational integrity as the highest priority. This priority must be fully funded or Reclamation risks unsafe structures and loss of project benefits. Every effort must be made to identify means to fund this priority, including off budget approaches. If Reclamation is unable to fully fund this priority level, it should identify those facilities with the least national interest and immediately initiate title transfer to the local beneficiaries. To do otherwise is to create a maintenance deficit that will never be overcome.

The second priority is to complete currently ongoing construction activities in the shortest possible time frame. This serves two interests. First, it will allow the public to realize the benefits associated with the expenditure of taxpayer funds at the earliest possible time. Second, it will minimize the cost of constructing the project by reducing non-contract costs and the effects of inflation associated with long construction periods. Any effort to discontinue funding ongoing construction should be a result of an informed decision by the Administration or the Congress and should not be a decision by default.

The third priority is directed towards deriving the most public benefit possible from exiting facilities. At the direction of Congress and with the support of the states, additional project benefits can be derived from existing facilities. The use of existing facilities to meet new water needs is often the most cost effective and expedient. These efforts should be supported by the existing project beneficiaries and be consistent with the state water law.

The fourth priority includes new construction and other activities not associated with existing projects or ongoing activities. There are many good activities that may fall in this priority level and this is not to say they should not be pursued. However, in these fiscally tight times for Reclamation, these new activities should not be funded to the detriment of the higher priority program activities. These new activities may need to be funded from federal sources other than the Reclamation program or from non-federal sources.

Along with prioritizing the Reclamation program, Reclamation must continue to pursue efforts to reduce the cost of doing business. Reclamation is making efforts to empower field offices and flatten the organization, and should be encouraged to finish what has been started. There remains room for significant improvement.

Reclamation must administer the projects under its jurisdiction to achieve the benefits authorized and directed by the Congress. It is not for Reclamation, but the

Congress, to determine if there is a higher purpose toward which the existing facilities should be used. Until—and unless—the Congress authorizes these additional purposes, Reclamation should dedicate its efforts to assure the effective and efficient delivery of presently authorized benefits. As Congress considers additional project purposes, current project beneficiaries must be involved with and supportive of any legislation affecting their interest in the project.

Lastly, as the Congress, the Administration, and the water community deliberate the future of the Reclamation program, certain actions need to be taken in conjunction with the program priorities addressed above. They include the following:

- Clarify Reclamation's relationship to the states' long-standing responsibility for allocating water resources within their jurisdictions, consistent with interstate compacts and decrees. Reclamation should affirm its long-standing policy of deferring to the states with regard to allocation of water resources and administration of water rights.
- Assure that Reclamation actions are consistent with its authorities. Many, if not most, Reclamation projects have very narrow project purposes, and cannot be expected to meet every current interest in water without reconsideration by the Congress.
- Clarify the relationship and obligations to Reclamation contractors, as opposed to other interest. Reclamation has specific legal and policy obligations to Reclamation project contractors. Reclamation has an obligation to consider the concerns of others and address impacts of contracting. These are not the same relationships and should not be treated as if they are.
- Develop incentive-based approaches to current water allocation problems. Increasing demands are being placed on Reclamation project water for wildlife, endangered species, recreation, environmental remediation, etc. Rather than taking this water from historic water users through regulation or legislation, Reclamation should provide incentive based approaches to resolution of water problems that ensure provision of water for historic users, while responding to new demands.

The CHAIRMAN. Thank you very much.

We will proceed now with Mr. Atwater.

STATEMENT OF RICHARD ATWATER, WATEREUSE ASSOCIATION, ALEXANDRIA, VA

Mr. ATWATER. Thank you, Mr. Chairman, members of the committee. Again, my name is Richard Atwater and I am representing the WateReuse Association, and again I have a written statement that I will submit for the record, but I will be brief.

We likewise think the Bureau of Reclamation has a vital and important role in the 21st century. Certainly, given that it is 103 years old and it has been around for over a century, it has a strong, vital, historic role, and we would say that in the future it needs to continue to provide strategically a leadership role in those areas in the Western States where it has really a very strong statutory authority, for example like the Colorado River Basin. It needs to provide leadership in the areas of innovative solutions, problem-solving, and importantly I think, and I think the committee will be looking at that as I heard the comments of the chairman, is the role in the partnership of evaluating new technologies, new research and development, and the application of that to solve our problems.

As others have already pointed out, we are not going to create new water in the West except through the application of new technologies where we reuse, recycle, and repurify waters that historically were unusable.

So that clearly is what I think is a strategic role for the Bureau. Short-term—and we can talk about the broader perspective of how to approach that—the Bureau of Reclamation now is partnering

with the Department of Energy, Sandia Labs, here at the WateReuse Research Foundation, and the American Water Works Research Foundation to do a road map on coordinating research. Certainly that is one example with your new research centers, that we can expand upon that and using that road map with these new centers of excellence would certainly be an excellent approach to expanding that ongoing effort.

Second, I would say that last fall through the omnibus legislation Congress enacted the Council on Environmental Quality to do a government-wide task force to look at the existing programs and existing efforts in water recycling, desalinization and such, to collaborate and coordinate. Clearly, not only the Bureau of Reclamation, but EPA, the Army Corps, the Department of Agriculture, and, frankly, in the areas like desalinization probably the Navy does more work than all the domestic agencies combined. That collaboration of research I think would be clearly something that would be useful and cost effective.

Then finally, let me just suggest that innovative financing—certainly we have difficult budgets and historically I think the targeted grants in the range of 10 to 25 percent, for example, to Bureau of Reclamation with the highly successful title XVI water recycling and desalinization programs, that kind of program, where you are demonstrating and developing new technologies to point out whether or not they are economic, proven operational, the questions that members asked about sea water desalinization. Well, the only way you are going to learn from that is actually have operating one 5, maybe 10 million gallon per day plants. And certainly throughout the West, every major metropolitan area needs to expand and stretch its supplies through water recycling and reuse.

With that, again I will submit my comments for the record.

[The prepared statement of Mr. Atwater follows:]

PREPARED STATEMENT OF RICHARD ATWATER, WATEREUSE ASSOCIATION, ALEXANDRIA, VA

2. ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY

The USBR was established in 1902 with a mission of ensuring adequate water supplies for the developing West. Congress recognized the need for multi-purpose water supply projects and authorized municipal and industrial supply as a mission of the Bureau of Reclamation in 1907. When the Bureau was established, the total population in the 17 western states was approximately 11 million people. In 2004, the population in the West totaled 97.2 million and is growing rapidly. The mission of the Bureau in developing municipal and industrial water supplies is even more critical today than it was 100 years ago.

The primary mechanism used by the Bureau to ensure adequate water supplies in its first century of operation was to build dams for storage of scarce water resources and the generation of hydroelectric power with irrigation supplies. While the mission of the Bureau has not fundamentally changed (although today the municipal and industrial supply issue is much more critical than the historic emphasis on irrigation supplies)—and need not change—in the 21st century, the mechanisms of ensuring adequate supplies must be dramatically different. The Bureau should play a leadership role in the development of alternative water supplies (e.g., water reuse and desalination), ensuring water use efficiency, and developing less costly and less environmentally disruptive means of storage such as aquifer storage and recovery (ASR) or groundwater conjunctive storage management (e.g., Orange County Water District's Groundwater Recovery Project). In many cases this is true for several federally authorized projects: Southern Nevada Water Project, Central Arizona Project, San Juan-Chama (Albuquerque), and the Hoover Dam/MWD's Colorado River Aqueduct. The Congress in 1986 recognized the need to augment the supplies of the Colorado River to meet the future needs of the river basin, but in

1986 the emphasis was on large importation projects. Today, it is appropriate for the Bureau to focus on water reuse, desalination, and water use efficiency.

The Bureau should take a leadership role in cutting edge technology to treat and reuse water. Title XVI is an example of a sound Federal investment. Under this program, the Federal government provides no more than 25% of the total capital costs while the local water agency contributes 75% or more. Thus, the Federal government leverages resource effectively, assists the local water agency with achieving an enhanced credit rating, and assumes no long-term financial obligation with operation and maintenance costs. The Title XVI program has benefited many communities in the West by providing grant funds that made these projects more affordable. The Federal cost share—although a relatively small portion of the overall project cost—often makes the difference in determining whether a project qualifies for financing. Compare this to the historic Federal Bureau authorizations of the Central Arizona Project, the Central Utah Project, and the Central Valley Project which provided 100% upfront capital financing and long-term subsidized repayment contracts (plus in some cases operating subsidies for many years).

The USBR should collaborate with the CEQ Task Force (described in the response to question #1) to address roles and responsibilities of different Federal agencies in addressing western water problems in collaboration with state and local governments.

The CHAIRMAN. You talked about an existing consortium. Tell us, what was that again, the one that exists now?

Mr. ATWATER. Yes. The Bureau of Reclamation, working with Sandia Labs through the Department of Energy, with our WateReuse Research Foundation and the American Water Works Association Research Foundation over the last 2 or 3 years put together a road map, a plan, if you will, on overall R&D. It is a collaborative effort where our water users, the State of California, the State of Florida for example, have contributed substantial amounts of moneys to leverage the Federal investment here in, in this case, like a four to one ratio with outside funding.

Again, it is an integrated approach to looking at the research and the application of technologies that will help solve our water problems.

The CHAIRMAN. Let us proceed. We are going to take you now, Patrick Tyrrell, Western States Water Council.

STATEMENT OF PATRICK T. TYRRELL, WYOMING STATE ENGINEER, ON BEHALF OF THE WESTERN STATES WATER COUNCIL

Mr. TYRRELL. Thank you, Mr. Chairman, members of the committee. Good afternoon. Again, my name is Pat Tyrrell, Wyoming State Engineer. However, today I have been asked to sit and talk on behalf of the Western States Water Council and its 18 member States in discussing the future of the Bureau of Reclamation.

The Bureau of Reclamation has an important and continuing role in meeting present and future water supply needs in the West. That role continues to evolve, from being a large builder to a water and power purveyor and manager. I have three areas where that role is most important, I believe. First of all, rehabilitation, as Mr. Semanko mentioned, of existing projects, necessary maintenance, and dam safety-related work must be a top priority. Second, water conservation efforts will continue to be essential. Third, the development of new supplies is essential, using both storage and more innovative techniques, such as water reuse, ground water recharge, desalinization, and control of phreatophites, to name a few.

To fund this work, Congress could consider or should consider increasing appropriations for the Bureau of Reclamation projects and

programs using the unobligated balance in the Reclamation Fund. The actual unobligated balance at the end of fiscal 2004 was over $3.8 billion and it is estimated to grow to about $5.9 billion at the end of fiscal 2006. This fund was created in 1902 and Congress intended these funds to be used to meet the need for water development and management in the West.

The Bureau's numbers for information today for rehabilitation for aging infrastructure are about $645 million for the foreseeable future and approximately $227 million over the next 5 years for safety work. In fiscal 2004, $4 million was directed toward Water 2025 initiative challenge grants, while over 100 proposals were received, requesting more than $25 million to help fund $98 million in needed western water delivery system improvements. For fiscal 2005, the Bureau has again received over 100 proposals, asking for in excess of $35 million for new projects with an estimated total cost of more than $115 million.

Such programs and new legislative authorities need funding. That again could be provided from the Reclamation Fund, including these Water 2025 challenge grants, drought planning and mitigation, small rural community needs, etcetera.

Finally, the Bureau and Western States must continue to work in a partnership that meets the diverse needs of the growing population. First, the Federal Government must continue to respect State-granted property rights to water and the rights of States to allocate and manage their water resources. Second, the Bureau should adopt proactive non-regulatory incentive-based approaches to managing water under its control consistent with States' rights. Finally, Reclamation should continue to pursue and fund work related to the existing Bridging the Head Gate Partnership and drought planning and preparedness activities.

On behalf of the Western States Water Council, I appreciate the opportunity to join in this important discussion on the future water needs of the West and the Nation.

Thank you.

[The prepared statement of Mr. Tyrrell follows:]

PREPARED STATEMENT OF PATRICK T. TYRRELL, WESTERN STATES WATER COUNCIL

PROPOSAL

Expand and fully fund Bureau of Reclamation programs to meet identified needs.

PREFACE

The Bureau of Reclamation operates hundreds of dams and reservoirs in the West supplying water and power to millions of people, irrigating millions of acres for food and fiber, providing flood control and recreation, and maintaining instream flows for fish and wildlife habitat, including anadromous and threatened and endangered aquatic species. The value of federal Reclamation projects in assisting western communities survive the continuing drought in the West, particularly the Northwest, can not be overstated. Two of Reclamation's expressed "mission goals" are: (1) managing, developing and protecting water and related resources to meet the needs of current and future generations; and (2) operating and maintaining facilities safely, reliably, and efficiently to protect the public investment.

Reclamation has stated, "Our challenge is to balance and provide for the new mix of resource needs in the West. . . . [P]roviding recreational opportunities and protecting the environment have become important to the public, while municipal and industrial development is demanding more, high quality water. With Western population growth . . . the future will be filled with greater demands on limited resources. Balancing the needs in the West and providing water resources has brought

into focus our ability to manage existing water efficiently and effectively, and to resolve conflicting needs through cooperation from multiple stakeholders and customers."[1]

Reclamation's mission goals have been subdivided into a number of long-term goals that include: (1) providing leadership in delivering water and power; (2) increasing water use efficiency and availability; (3) ensuring effective operations of facilities; and (4) operating, maintaining and rehabilitating facilities to ensure reliability and cost-effectiveness—to name a few. Its strategy for accomplishing these goals lists several guiding principles that include: (a) the use of broad based proactive conflict resolution methods; (b) continuing a close working relationship with traditional water users, while forging relationships with other users; and (c) promoting and using partnerships to create sustainable solutions, leverage resources and learn from others.

The Bureau of Reclamation and western state water managers, represented by the Western States Water Council, have many common interests. In a 1997 report for the Western Water Policy Review Advisory Commission, the Council declared, "In the arid West, providing adequate water supplies to meet future demands continues to be a priority." Making more water available for new and expanded uses and increasing water use efficiency are critical, given the fast growing population of the West, subsequent demands for water for domestic and municipal uses, continuing agricultural water demands, and increasing demands for water for environmental uses, particularly the needs of endangered and threatened aquatic species. Reclamation has and will continue to play an essential role in meeting western water demands.

WHAT SHOULD THE FUTURE ROLE OF THE BUREAU OF RECLAMATION BE IN THE WEST?

While the construction of large new federal dams and reservoirs is unlikely for the foreseeable future, Reclamation faces an enormous challenge related to its portfolio of aging dams and related infrastructure. Dam safety must be a priority. Reclamation is also actively pursuing programs to help irrigation districts and other water users make the most efficient use of available supplies. The Council supports this proactive, non-regulatory, incentive-based conceptual approach to administering federal water conservation programs, and the related "Bridging-the-Headgate" Partnership. We support the overall objective of these activities, which is to work together as federal-state-local partners for the sustained and efficient use of western agricultural water supplies.

The Congress is considering reauthorizing and extending the Small Reclamation Projects Act with more money for loans and grants for water development. This is an important program which deserves congressional support.

Interior's Water 2025 Initiative is an example of Reclamation's efforts to address water resources challenges in the West before conflicts reach a critical impasse, as in the Klamath River Basin. Western states believe the scope of the program is insufficient to meet the growing need. As Senator Domenici has declared, the appropriation of $20 or $30 million a year in new money is woefully inadequate to address our needs. However, the success in leveraging federal, state and local resources through Water 2025's challenge grants is an example of what can be accomplished if we are willing to work together. It would appear that matching non-federal support could easily be found for $100 million in federal money.

As discussed later in the statement on drought, the Council has a long history of work in the area of drought planning and management. We support Reclamation's efforts with respect to assistance for state and local drought response and relief activities.

SHOULD THE BUREAU UNDERTAKE WATER SUPPLY AUGMENTATION ACTIVITIES?

The development and use of new water supplies to meet present and future demands is a priority for western states. More storage is essential. Reclamation has been and should continue to be a leader in the development of a number of alternatives and technologies that promise to help meet future water needs: (1) ground water recharge, storage and recovery projects; (2) water reclamation and reuse projects; (3) desalination; and (4) phreatophyte control, including eradication of salt cedar. There may be other opportunities to increase water storage and yields from wetlands/streambanks through better management of state and federal lands and riparian zones. New opportunities may exist for increasing the efficiency and yield of existing federal, state and local water supply systems through project modifica-

[1] Draft 2000-2005 Strategic Plan, October 22, 1999.

tions or re-operations. Further, new reservoirs and off-stream storage projects should not be ruled out.

As explained in the Council statement on water supply, the Council strongly supports federal legislation to provide technical and financial assistance for small rural communities struggling to meet their water supply needs. Legislation is needed to create a systematic, integrated approach to investigating, authorizing and constructing projects to meet rural western needs in close cooperation with State, local and regional entities, as well as tribes. Existing authorities, such as the Drinking Water State Revolving Loan Fund, are not sufficient to meet the needs of small rural communities, which are facing serious obstacles in securing the resources necessary to ensure an adequate and reliable water supply for their future. New authority and significant new funding is essential to better meet the needs.

WHAT ROLE SHOULD THE BUREAU PLAY WITH RESPECT TO THE WEST'S (OTHER) FUTURE NEEDS?

Endangered species and western water management are and will continue to be intertwined. Finding water for fish and farmers, as well as growing municipal and industrial needs, within the parameters of state water law and federal environmental law is a challenge that must be successfully met. Reclamation and others are already deeply involved in negotiating and implementing programs to purchase and lease water for endangered species, provide incentives to restore and protect habitat, build fish screens and fish ladders, etc. With respect to the issue of dam removal, the engineering issues and legal and socioeconomic issues, as well as functional alternatives to small and large dams need to be carefully considered. Reclamation has experience and expertise in these areas.

The needs of native American tribes and settlement of Indian water rights claims is another priority concern for state and federal water managers. As explained in a separate statement on the subject, the WSWC has and will continue to support the successful negotiation and implementation of settlements that provide certainty for all stakeholders. The Bureau of Reclamations plays an important role in achieving this goal.

The efficient, effective and safe operation of Reclamation facilities is important. Moreover, state and local officials—in cooperation with Reclamation and other federal water managers—together need to look at water problems and opportunities to increase water yields on a watershed or river basin basis. Participation by all interested parties in grassroots watershed efforts holds the promise of success in resolving many, but not all, western water problems—water quality problems, as well as quantity problems.

Federal water project transfers to local ownership, as well as operation, and the transfer of federal project and wheeling of nonproject waters are also important areas for cooperative action between Reclamation and state and local interests.

COMMENTS ON FUNDING MECHANISMS

The billion dollar question is how should Reclamation programs and projects be funded? The President's FY06 budget request for the Water and Related Resources account totals $802 million, down from $859 million appropriated last year. Further, the request anticipates that off-setting receipts collected by the Western Area Power Administration (WAPA) for operation and maintenance and other expenses allocated by Reclamation to WAPA would reduce the final appropriation to some $771.6 million. According to program and financing figures and estimates, new budgetary authority (gross) for obligation has dropped from $994 million in FY04, to $972 million in FY05 and is projected to be $919 million in FY06. Total gross outlays would be $940 million, compared to an estimated $1.028 billion in FY05 and $953 million in FY04.

Meanwhile, the unobligated balance in the Reclamation Fund is expected to grow from $3.877 billion at the end of FY04 to an estimated $4.812 billion for FY05 and $5.905 billion in FY06. Created by the Reclamation Act of 1902, the Reclamation Fund was envisioned as the means to finance western water and power projects with revenues from western resources. Its receipts are derived from water and power sales, project repayments, certain receipts from public land sales, leases and rentals in the 17 western states, as well as certain oil and mineral-related royalties. It is a special fund within the U.S. Treasury that is only available for expenditure pursuant to annual appropriation acts. With growing receipts, in part due to high energy prices, and declining federal expenditures for Reclamation purposes, the unobligated figure gets larger and larger—while the money is actually spent elsewhere for other purposes. While receipts in the past were insufficient for the construction of major federal projects such as Grand Coulee and Hoover Dams, which required

the appropriation of general Treasury funds, today it appears that the Reclamation Fund could serve as a revolving account that would pay for Reclamation and related water resources programs and needs in the West.

Examples of similar federal authorities include the Highway Trust Fund, Land and Water Conservation Fund, Southern Nevada Land Management Act and most recently the Arizona Water Rights Settlement Act.

Another alternative might be to create state revolving funds (similar to the popular Clean Water and Safe Drinking Water SRFs) that could be capitalized with dedicated Reclamation Fund receipts, in excess of agency appropriations, to assist in financing state and local water resource development and conservation projects and programs, or water right acquisition and water trust programs. Such funds might also be used to finance water conservation and water resources related environmental restoration projects and programs (to protect instream resources, endangered and threatened species, etc.).

On the other hand, some 25 years ago, Senator Domenici and the late Senator Daniel Patrick Moynihan proposed a [block grant] program to assist states with their water development needs, which western states thought merited consideration. Virtually every western state already has some type of water resources related assistance programs in place that would benefit. Further, it would keep the proceeds for development of western resources in the West as the Congress envisioned in 1902.

Federal Reclamation funds might also be authorized to provide a Water Insurance Trust to guarantee the repayment of state and local water related bonds. The WSWC has in the past supported such an insurance fund, as well as the use of tax-exempt bonds to finance water resources needs. State and local agencies have always financed the majority of their own water needs, but federal assistance has and will continue to be important.

The federal government has in the past usually taken the lead on large regional basin-wide and multi-state multi-purpose projects (with particular national objectives). While the era of big dams may indeed be over, a role for the federal government remains. Perhaps it is time to focus federal financial resources intended to aid in western water development to help state and local agencies meet the future challenges of supplying adequate water of suitable quality in the face of growing municipal and industrial demands and federal requirements to protect public health and the environment.

Fully funding and expanding past and present Bureau of Reclamation programs to meet identified needs, and/or authorizing the use of Reclamation Fund money to capitalize a new federal SRF (or otherwise assisting existing state and local programs), would go a long way towards meeting the growing demands placed on western water resources.

The CHAIRMAN. Thank you very much.

Family Farm Alliance, Dan Keppen. Would you now proceed, please.

STATEMENT OF DAN KEPPEN, EXECUTIVE DIRECTOR, FAMILY FARM ALLIANCE

Mr. KEPPEN. Mr. Chairman and members of the committee, thank you for this opportunity to speak today.

The Family Farm Alliance has represented family farms, ranchers, and irrigation districts in 17 Western States for the last 17 years. We are the Bureau of Reclamation's customers and we are focused on one thing: to ensure the availability of reliable, affordable, irrigation water supplies to western agriculture.

What should the role of Reclamation be in the 21st century? Its primary role should be to continue to fulfill its core mission of delivering water and power in accordance with contracts, water rights, and other requirements of State and Federal law. Just as important, Reclamation should operate, maintain, and modernize its infrastructure in the most cost effective manner possible. All of Reclamation's other activities are secondary.

Others on this panel have underscored their concerns about the aging of Reclamation facilities. We share those concerns because

our communities rely on those facilities for their very existence. We also are the ones who pay most of the costs in maintaining and modernizing Reclamation projects. In general, irrigators are obligated to pay 100 percent of the costs of project operations and maintenance, which covers everything from repainting guard shacks to replacing multi-million-dollar flood gates, plus irrigators must pay those costs immediately, not over time. That is why family farmers, ranchers, and irrigation districts want to see Reclamation operated in the most cost effective way possible.

An engineering committee of the National Academy of Sciences is currently focusing on the question of what cooperatives should remain with Reclamation and what work might be performed by others. The alliance welcomes this review and we are actually compiling experiences from around the West, both good and bad, to develop specific recommendations for the Academy. We have included five sample case studies as attachments to our written and more detailed testimony that you should have received yesterday.

In summary, urban growth and competition for water supplies are driving western farmers off the land at a time when American food production in general is following other industries offshore in search of lower costs. Western irrigated agriculture is a critical national resource and the role of Reclamation in the 21st century should be to protect and enhance that resource.

Thank you.

[The prepared statement of Mr. Keppen follows:]

PREPARED STATEMENT OF DAN KEPPEN, EXECUTIVE DIRECTOR, FAMILY FARM ALLIANCE

TOPIC #2: ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY.

What should the future role of the Bureau of Reclamation be in the West? Should the Bureau undertake water supply or supply augmentation activities which are designed primarily for municipal and industrial purposes, such as the Title XVI Program? Please also include comments on potential financing mechanisms such as grants or loan guarantees. What role should the Bureau play with respect to addressing: the West's future water needs; drought and flood planning and response; water infrastructure, including dam safety and site security; facility operation and maintenance; rural water needs, including in Indian country; hydroelectric power; recreation; watershed restoration; and water use efficiency?

The Family Farm Alliance strongly supports the focus of the Bureau of Reclamation (Reclamation) on fulfilling its core mission of delivering water and power in accordance with applicable contracts, water rights, interstate compacts, and other requirements of state and federal law. Inherent in this definition of core mission is the need to prioritize the expenditure of federal funds and other resources of the Department of the Interior. Water 2025, so long as it continues to recognize that transfers and the use of market mechanisms must be voluntary and pursuant to state law, provides a strong foundation for defining the role of the Bureau in meeting future water needs of the West.

As is recognized by Secretary Norton's Water 2025 Initiative, it is imperative that Reclamation provide for the operation, maintenance, and modernization of existing water supply infrastructure. Many Reclamation facilities are approaching the end of or are past the design life of the facilities. In addition, many of these facilities also need to be replaced with modern designs that provide for greater water management efficiency. Sound business practices dictate that this existing infrastructure, and the water supply provided by these facilities, be protected and preserved prior to the dedication of scarce funds to the development of new supplies. With respect to the specific question regarding the role of the Title XVI Program, the Family Farm Alliance observes that many of the existing and potential recipients of these funds are entities that have the financial capacity to fully fund the development of alternative water supplies. The Title XVI Program should not be funded at

the expense of taking care of existing infrastructure and protecting important agricultural communities that do not have the same financial capabilities.

The Family Farm Alliance supports the Water 2025 matching grant program, and suggests that it be expanded to provide additional opportunities for the investment in water conservation and efficiency measures. However, because this program is unlikely to meet all of the needs for funding the repair and modernization of existing facilities, additional funding mechanisms must be developed. Alternatives include a return to the Small Project Loan Program, or the development of federally backed loan guarantees that will enable water users to access alternative sources of capital in order to repair and modernize existing infrastructure. With respect to financing projects, the historical use of zero interest loans already authorized by Reclamation law still has some merit; especially when it has been conclusively shown that many projects have returned their construction costs to the Treasury many times over from tax revenues directly related to the project benefits. Even in areas of less intensive irrigation and population, benefits from the various projects have more than returned their cost, especially when all of the project benefits, including those not originally authorized and assigned costs, are considered.

Another possibility would be to allow entities with annual repayment obligations to shift those obligations to operation, maintenance and replacement reserve accounts. Although this does have an impact to the return to the Treasury, it could reduce the potential need for future assistance for major rehabilitation. Also, it would seem appropriate for Congress to allow for the capitalization of OM&R. Many of the infrastructure problems on old Reclamation facilities could have already been addressed if capitalization of OM&R had been authorized.

A number of years ago the Family Farm Alliance took the lead in an effort to provide for cost containment and accountability for work by the Bureau of Reclamation that was either funded in advance by water users or subject to repayment obligations. With the cooperation of the Bureau of Reclamation in general, and Jack Garner in particular, great progress was made in this regard. However, given that federal, state, local, and private funds will be scarce, it is imperative that these efforts continue.

Recent events on several fronts that are related to this issue have been a source of concern to the Family Farm Alliance. First, the unfortunate experience with the cost overrun on the Animas-La Plata Project provided a warning signal that additional work was needed to ensure that Reclamation continues to focus on cost containment and accountability for projects funded through the Reclamation Program. Second, a number of our members have dealt with situations where cost estimates for work that would be done by the Bureau of Reclamation were substantially over the cost of having the work done by the local district itself or under contract with private consultants. There appear to be at least two reasons for the divergence in the cost estimates—excess staffing by Reclamation for work, with attendant increases in costs, and the requirement of design standards that are excessive or unjustifiable. Third, the Family Farm Alliance is deeply concerned to hear that at least one district has been forced to use Reclamation staff for design work and was not given the option of doing the work itself or having it performed by qualified consultants. This incident is of great concern because it is contrary to the practice elsewhere in Reclamation, where contractors who are paying for the work have had the option to have the work performed by Reclamation or by qualified consultants.

In light of the fact that neither Reclamation nor water users can afford to waste money through over-staffing or noncompetitive practices, the Family Farm Alliance encourages the Committee to take a very hard look at the policies and practices of Reclamation with regard to the involvement of the Reclamation programs located at the Denver Federal Center. The Family Farm Alliance also plans to provide input to the ongoing review of these aspects of Reclamation by the National Academy of Engineering, which appears to be focusing on the question of what capabilities Reclamation should maintain within the agency and what work or functions can and should be performed by others. However, regardless of the outcome of this review, fundamental fairness requires that when a water user is paying for work in advance or through repayment mechanisms, that water user should have the option to have the work executed in the manner that provides the most return for the investment.

These concerns regarding cost containment and accountability do not, in general, implicate the work done at the Regional and Area Reclamation Offices. The Family Farm Alliance is proud of its partnership with Reclamation, and believes that Reclamation has much to be proud of in its service to water users and the public.

The CHAIRMAN. Thank you.

The city of Santa Fe, Galen Buller, nice to have you here. You had a little water this year.

STATEMENT OF GALEN BULLER, DIRECTOR, SANGRE DE CRISTO WATER DIVISION, CITY OF SANTA FE, NM

Mr. BULLER. Mr. Chairman, we had a little snow for a change. It has been nice.

The city of Santa Fe, New Mexico, has, like I think many municipalities, woken up as a result of the 2002 drought. We see the need for protecting and augmenting our sources of supply. The city has been involved in a number of projects to do just that: water management and protection, conjunctive management between its surface and its ground water sources, conservation measures which have brought per capita usage in the city to among the lowest in all of the Southwest, and reuse projects, infrastructure rehabilitation, and that kind of thing.

But as the result of approaching those needs, we have also identified a number of issues. We are involved in one of the longest running adjudications in the country that involves Native American water rights. We are involved with the silvery minnow issues and other environmental community concerns. We have the need for contract renewals with the Bureau of Reclamation for our San Juan-Chama water. And we are involved with the agricultural community as well.

All of these issues also provide opportunities for partnerships and we have tried to pursue those. Those partnerships also involve at the Federal level the Bureau of Reclamation, who we have seen as a close partner through these years and would like to continue that relationship.

But we do feel that it is time to revisit Reclamation's mission for the 21st century. It fulfilled its 20th century mission, we think, and there is a new mission that can be filled. There are several statutory mission goals that I think should explicitly be included.

The first would be new arrangements for water projects and agreements that do not expire or terminate, to provide municipalities with secure and continuous access to the water supplies they depend on.

The second is to cooperate to develop water supplies and sources of water through more efficient storage and desalinization projects, protecting our existing sources of supply through watershed restoration and protection and maintenance of water conveyance efficiencies.

The third is to streamline market-based conversions of water used for irrigation, for maintenance and industrial purposes, and to meet environmental needs.

The fourth is to provide grants and loan guarantees to assist municipals that are demonstrating a strong and capable commitment to help themselves.

The fifth is to develop or provide water to settle Indian water rights and Federal reserved water rights claims.

We believe that some of these are evolutionary, perhaps some are revolutionary, but all are necessary.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Buller follows:]

PREPARED STATEMENT OF GALEN BULLER, DIRECTOR, SANGRE DE CRISTO WATER DIVISION, CITY OF SANTA FE, NM

TOPIC 2. ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY

The Bureau of Reclamation has largely fulfilled the mission that Congress assigned to it over 100 years ago. Sustained rates of population growth have literally become a way of life in New Mexico and throughout the West, bringing significant challenges and unprecedented pressures on our water resources for meeting municipal and industrial needs. Now is the time for Congress to revisit Reclamation's mission for the 21st century to undertake water supply and supply augmentation activities in the West for the purpose of assisting municipal and regional water providers to meet their water supply and drinking water needs.

Congress should address several related topics in Reclamation's new mission to squarely include municipal water supply development and to help municipal providers obtain and maintain reliable sources of supply. Our experience in water resources management in New Mexico suggests that Reclamation's revised statutory mission should explicitly include the following:

- Implement new arrangements for Reclamation water projects and agreements that do not expire or terminate, to provide municipalities with secure and continuous access to the water supplies that they depend on to meet their long-range needs.
- Cooperate with states and municipalities to develop water supplies, including new sources of water supply through more efficient storage of water and desalination; protecting existing sources of supply through watershed restoration; and protection and maintenance of water conveyance efficiencies.
- Streamline market-based conversions of water used for irrigation for municipal and industrial purposes and to meet environmental needs.
- Provide grants and loan guarantees to assist municipalities that are demonstrating a strong and capable commitment to help themselves.
- Develop or provide water to settle Indian water rights and federal reserved water rights claims.

Each of these topics is discussed briefly below.

Municipalities, such as Santa Fe, depend on water service contracts for significant portions of their water supply portfolio. In many cases, these contracts have expiration dates and may have renewal arrangements that are subject to Reclamation's discretion. As an example, the City of Santa Fe and its regional partners are now investing over $100 million in a new system to divert and treat the City's allocation of Reclamation's San Juan-Chama Project water, even though the City does not currently have a permanent or even long-term agreement for use of that water. Given the importance of water supply for the well being of the people and economies of the West, it would be appropriate for Congress to limit Reclamation's discretion in renewals of these types of contracts and to establish congressional policy favoring replacement of water service contracts with permanent arrangements that do not expire.

The water supplies of the West are generally fully developed, except for the new usable water that more efficient water storage and desalination can provide. Reclamation's 21st century mission should squarely include both of these areas of endeavor. Similarly, Reclamation's mission should also include watershed restoration and protection and maintaining the efficiencies of water conveyance in order to maintain the productivity of watersheds upon which municipalities depend for their water supply, and protect water supplies from losses suffered in conveyance. Aquifer storage and recovery has great potential for storage of municipal water supplies in a manner that eliminates evaporative losses, increases net supplies, and increases drought reserves, yet its widespread use will be hindered until further applied research is conducted. Reclamation should be specifically authorized to assist municipalities with aquifer storage and recovery and desalination projects that will reduce water losses, facilitate the development of waters of lower raw water quality, and increase drought reserves. Congress also should direct Reclamation to avoid damage to municipal water supplies through maintaining the efficiency of water conveyance. Santa Fe, for example, is directly hurt if reduced water conveyance efficiencies on the Rio Grande contribute to low water storage levels in Elephant Butte Reservoir, which in turn, prohibit Santa Fe's storage of native water in its Santa Fe River Canyon Reservoirs. If environmental restoration needs require additional water losses in conveyance, Reclamation should be responsible for offsetting those additional losses so as to keep municipal water supplies intact.

Reclamation's use of a historic federal law (the 1920 Miscellaneous Purposes Act) to convert irrigation water supplies to municipal and industrial purposes should be

discontinued. While the vast majority of all the water development of water in the West was for irrigation purposes in order to settle the West, municipal and industrial and "urban" growth now represents virtually all increases in water use. But its vibrant municipalities and industries and economies need water. Congress should provide for a mechanism that streamlines the process of market conversions of water to these contemporaneous needs, while providing fair compensation to the farmers through the market.

As demands on supplies increase, water supply development projects become even more expensive—often measured in the hundreds of millions of dollars even for communities of Santa Fe's size. Congress provided very low cost development of water originally for the West. Congress should provide new mechanisms to provide some grant funding and loan guarantees for the expensive projects that municipalities need, such as aquifer storage and recovery, desalination, and other technological and infrastructure needs, to secure their water supply futures. Further, each of Reclamation's existing funding programs should be reevaluated—potentially through input from current and potential future local project sponsors—to identify the strengths, weaknesses, and applicability in meeting the evolving needs of communities throughout the West.

Providing finality through realistic and fair settlements of tribal and federal water rights claims is essential for the well being of western municipalities, specifically including Santa Fe (as detailed further in our submittal for Topic 3, Indian and Federal Reserved Water Rights). Reclamation should be assigned an explicit role to help fairly settle these matters and bring the uncertainty that surrounds them to an end.

Together, we believe that these specific changes to Reclamation's mission and responsibilities will allow Reclamation to fulfill a critical role in meeting the evolving and growing water needs of the American West.

The CHAIRMAN. Thank you very much.

Mr. Rick George, Confederated Tribes of the Umatilla Indian Reservation. We are pleased to have you, sir. Thank you.

STATEMENT OF RICK GEORGE, CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Mr. GEORGE. Thank you, sir. Good afternoon, Mr. Chairman, members of the committee. Senator Smith, hello from Oregon, where it is finally raining and snowing.

Senators, today I would like to use as an example the Umatilla Basin Project to illustrate what we think the Bureau should be in the 21st century. We have chosen that example, one, because it is in the home of the Umatilla Indian Reservation and of Senator Smith, and also because it is a success.

It is located on the Umatilla River in northeastern Oregon, and we believe that the Umatilla Basin Project represents a national model for the Bureau of Reclamation, and again one that demonstrates success. Not to be presumptuous, but the tribes believe that success should define the Bureau of Reclamation in the 21st century.

The Umatilla Basin Project's success is demonstrated by its accomplishments. The project restored a dry riverbed, drained dry in fact by a previous Reclamation project, and it restored it to a partially flowing Umatilla River once again. The project thus enabled the tribes to recover salmon to the basin, salmon that the tribes have a treaty right to, and today the basin has gone from zero salmon for over 70 years to 30,000 adult salmon coming back to the basin—another demonstration of success. Senator Smith can now fish for salmon in downtown Pendleton.

The project protected and even enhanced irrigated agriculture while restoring the Umatilla River and restoring the fishery. Finally, the project set up the opportunity to negotiate the settlement

of the water rights, the Federal reserved water rights for the Confederated Tribes of the Umatilla Indian Reservation, and finally bring equity to the water allocation in the Umatilla Basin.

Last, Senators, the Umatilla Basin Project under the Bureau of Reclamation's leadership brought neighbors together, and ultimately that is the end result of success. It is a people factor, and in the Umatilla that people factor of success was achieved.

We are now working on the final phase, phase three of the Umatilla Basin Project. We hope to bring that back to this committee for authorization just like phase one and two were brought to this committee and shepherded through Congress by Senator Mark O. Hatfield.

I thank you for your time today.

[The prepared statement of Mr. George follows:]

PREPARED STATEMENT OF RICK GEORGE, CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

2. ROLE OF THE BUREAU OF RECLAMATION IN THE 21ST CENTURY

The Umatilla Basin Project (UBP) Act (*100 P.L. 557; 102 Stat. 2782 Title II*), passed by congress in 1988 under the visionary leadership of Sen. Mark O. Hatfield, is *the* hallmark example of the need for, and the potential of, the U.S. Bureau of Reclamation in planning, designing and implementing projects to address water supply and water resource management in the West.

In the UBP the Bureau of Reclamation (BOR) played the central federal agency role in planning (EIS and feasibility report), designing and constructing the water supply and distribution infrastructure. This role was important not just because they had the expertise, but also because they had the history. It was the BOR in the early 1900's (see *#1 Water Supply and Resource Management Coordination*) that constructed and subsequently operated the irrigation reclamation project that dewatered the Umatilla River and that the UBP ultimately fixed.

In a nutshell, the infrastructure for the UBP took advantage of the existing irrigation delivery system, and added new, large capacity water pumps capable of pumping over 200 cubic feet per second (cfs) of water. The new pumps were located near the mouth of the Umatilla River where it empties into the Columbia River. With restoration of Umatilla River streamflows as the project goal, the UBP pumps lift water from the Columbia River and delivers it to the existing Umatilla River irrigation distribution system. From a water management perspective, for every bucket of water not diverted from the Umatilla River, a bucket is pumped from the Columbia River to the Umatilla Basin irrigation system. The end result is a partially restored Umatilla River (about 50% of total spring-fall stream flow is now left in-channel for fish) and partially recovered spring and fall chinook and coho salmon populations. Summer steelhead, pacific lamprey and other native fish stocks continue to be nurtured toward recovery and along with the salmon runs require additional water and habitat restoration (see *#3 Indian and Federal Reserved Water Rights*). Further, this unique "water exchange" between the Columbia and the Umatilla rivers, regulated under Oregon water laws, results in no net loss to stream flows in the Columbia River. This results from the bucket for bucket exchange that leaves the same amount of water in the Umatilla River and which ultimately empties back into the Columbia River.

The BOR played a diversity of roles in the negotiation, development and implementation of the UBP. These roles can be divided into the following categories:

1. Proponent—under the leadership of then-Regional Director John Keys, the BOR worked closely with key stakeholders, CTUIR and three irrigation districts, to help to find common ground.

2. Expert—the BOR was the irrigation infrastructure, reservoir contracting, state water rights connection and project design and construction expert.

3. Trust—a key component to allocating water in the 21st Century is trust. The BOR in the 1980's and 1990's provided key senior personnel to stay involved in basin-level negotiations between CTUIR and irrigation districts and later with citizen groups and others interested in the outcome. CTUIR believes that had it not been for the active, personal involvement and presence of then-Regional Director John Keys and his staff the UBP may not have been completed.

Twenty first Century roles for the BOR should continue to be:

1) Advocate for and assistance in settlement of federal reserved water rights for Tribal governments.

2) Assistance in planning and constructing the infrastructure necessary to serve the basic current and future water needs of Tribal governments as part of satisfying reserved water rights by striving for compatibility with existing water uses and rights.

3) Providing expertise in developing and implementing solutions to water allocations, planning and management of water resources.

4) Providing direct assistance to Tribal governments in the forms of in-kind personnel assistance (e.g. water resource engineering), funding agreements to fund Tribal self governance work related to water development and management, assisting Tribal governments to manage BOR facilities that serve Tribal Governments, assisting Tribal governments in marketing and managing trust water resources, providing technical assistance to Tribal governments in quantifying and planning for the later negotiation and settlement of Tribal water rights claims.

5) Watershed restoration and water acquisition for instream flow restoration.

Most important for completion of a long-lasting Umatilla Basin water solution is for the BOR to complete the shared vision of Sen. Mark Hatfield, the CTUIR and the Umatilla Irrigation Districts—Settlement of CTUIR reserved water rights and completion of Phase III of the Umatilla Basin Project. Major legal and procedural accomplishments are being made between CTUIR and the Westland Irrigation District that are paving the way for BOR planning and design of Phase III and for a negotiated settlement of the CTUIR water rights. A request for authorization of construction of Phase III of the Umatilla Basin Project and the infrastructure needed to serve CTUIR consumptive water needs will be before the Energy and Natural Resources Committee in the next couple of years.

Phase III of the Umatilla Basin Project will provide Columbia River water for Westland Irrigation District, the last remaining and largest irrigation district on the Umatilla River. Completion of Phase III will provide enough water in combination with the existing Phases I and II, and most importantly, water that is not obligated to competing uses, for CTUIR on-Reservation consumptive uses and for instream flows to protect the recovered salmon populations and to allow for recovery of lamprey, steelhead and other important resources. Senator Mark Hatfield challenged the Umatilla River Basin to achieve that goal—final and complete water management and allocation settlement—20 years ago. That goal is now within the vision of the CTUIR and basin irrigation districts, the Honorable Governor of Oregon Theodore Kulongoski and we look forward to working with the Committee to make it happen.

The CHAIRMAN. Thank you very much.

Bureau of Reclamation, could I ask you, Ms. Bach?

Ms. BACH. Yes, Mr. Chairman.

The CHAIRMAN. In last year's omnibus appropriations bill I had some language put in there that the Council on Environmental Quality (CEQ) undertake a review of existing Federal water use—I think somebody alluded to it here—water reuse, recycling, reclamation programs. Do you know what the status of that effort is?

Ms. BACH. Mr. Chairman, I am familiar with the language that was in the omnibus appropriations bill and sought to verify the status of that and I do not have the status for you at this time, but I would be happy to provide it for the record.

The CHAIRMAN. I think it would be important that you do that. We keep talking about it, but we ought to start with some basis to know what we have got going.

Ms. BACH. Certainly, Mr. Chairman.

The CHAIRMAN. You will provide us that as soon as you can?

Ms. BACH. Yes, I will, Mr. Chairman.

The CHAIRMAN. Senator Bingaman, do you have any questions of the panel?

Senator BINGAMAN. Yes, thank you, Mr. Chairman.

Let me ask, Mr. Buller. You have a couple of statements in your testimony here which caught my attention. You say: "Reclamation's use of a historic Federal law, the 1920 Miscellaneous Purposes Act, to convert irrigation water supplies to municipal and industrial purposes should be discontinued."

Then you also say, a couple of sentences later: "Congress should provide for a mechanism that streamlines the process of market conversions of water to these contemporary needs"—I think they are talking about municipal and industrial needs—"while providing fair compensation to the farmers through the market.

I am a little unclear as to what you see as the need for Congress to get involved in this. As I understand, in our State and in most States if you have got a willing seller of a water right and you have got a willing buyer of a water right, then the transfer occurs. Why does Congress need to be providing a mechanism in this area? And why should we change this Federal law to prohibit Reclamation from converting irrigation water supplies to these purposes?

Mr. BULLER. Senator, let me first say that I am not advocating that the Federal Government step in and take over where State water law has worked so well over the years. Let me take those one at a time.

The Miscellaneous Purposes Act of 1920 has been the mechanism that the Bureau of Reclamation has used to help facilitate those kinds of transfers of Reclamation projects. It has become, I think, cumbersome and it does not really lend itself to creative thinking and creative methodology, or it does not really create a mechanism for providing financing the way that it perhaps could.

The suggestion there is that somehow we look at new legislation that fosters creativity in the transfer of water rights from agricultural to municipal and industrial where it makes sense to do so.

As to the other question, why do we need the Federal Government's participation in that, the Bureau of Reclamation has had a long tradition of helping to facilitate the transfer. It is not in lieu of State law; it is done pursuant to State law. But that expertise in how transfers could occur from the agricultural community to the municipal and industrial uses that are the ones that we see the most need for, at least from my perspective. That expertise might be there to help.

We have had several examples just in the city of Santa Fe, and you may be aware of some of them, Senator, where we have tried to bring agricultural rights to the city and, for various political reasons and others, they have not worked out. That might be fine that they did not work out. There might have been all kinds of problems. But we could use the expertise in how over the years the Bureau of Reclamation has helped to make that happen.

Senator BINGAMAN. Thank you very much.

Senator SMITH [presiding]. Thank you, Senator.

With the chairman's permission, I want to welcome especially Anton Mentorn and Rick George from the Umatilla Indian Reservation, and also Dan Keppen, the new executive director of the Family Farm Alliance. They are both here from Oregon and are very active in constructive ways to resolve the disputes over water and provide a reliable source of water for farmers, as well as to take better care of our natural resource.

Rick George hit on something that I do not know whether people in the audience necessarily fully understand just how successful the Umatilla Project has been. Rick explained, I think, that it is literally an exchange of water from the Columbia River in order to leave water in the Umatilla River, and this has enabled us to restore salmon runs while preserving the livelihood of many farmers in this area.

It has been incredibly successful and I salute the tribe and the farmers for this creative effort, and the Bureau of Reclamation for being an integral part of making this happen.

Rick, you indicated that this could be a model for a national model. Obviously, it is possible as a model in Oregon because the Columbia River as a main stem of the water resource has an awful lot more water than places like the Rio Grande or even the Colorado River in a relative sense.

But I wonder, Maryanne, are there other areas in the West where the Umatilla Project could be a model to solve these environmental and farming disputes?

Ms. BACH. Senator, what I would say is that, given the number of reservations that are in the West that are in geographically colocated areas as Reclamation projects, that there are undoubtedly opportunities for crossover of understanding of what happened on this project and elsewhere and how it could be applied.

Senator SMITH. Well, let me use this forum to encourage the Bureau to look to the Umatilla Project as a way to solve these very real problems between the environment and the users that, just like fish, they cannot live without water either.

Rick, you started your comments by noting that it is raining in the Northwest. The last time I checked we were 40 percent below normal in the snowpack. What is it today with the recent spring rains?

Mr. GEORGE. Well, the west side is starting to catch up. We are above 50 percent now. But on the east side we are still down below 50 percent.

Senator SMITH. Dan, Dan Keppen, you noted that the Family Farm Alliance is compiling case studies of how the Bureau of Reclamation deals with local water agencies on construction and other issues. Have you found some cases you can talk to us, whether they are good or bad, that you can highlight?

Mr. KEPPEN. Well, I have summarized five of them in the written testimony that I submitted to you. What we are doing right now is putting together a larger report that we intend to submit. It is kind of a subset of the National Academy of Sciences. It is called the NAS Board on Infrastructure and the Constructed Environment, and they are actually doing an independent peer review of how Reclamation does business, in particular looking at opportunities perhaps to outsource some of the design and build work.

So we want to engage in that process in a constructive way. There are some bad horror stories out there, but there are also some very good stories. We are about halfway through putting this effort together and I have got five of them laid out in your testimony, two from California that we consider to be success stories, three that outline some kind of consistent themes that we are hearing.

Generally, the concerns are not with the area offices or the regional offices. It is more with the technical services center in Denver is where we are hearing the concerns. So I would encourage the committee to track this Academy assessment and perhaps that could form the basis for some policy discussions later on.

Senator SMITH. Several years ago the Appropriations Committee required the Bureau to submit a report outlining direct and indirect operations and maintenance costs for each of the Federal reclamation projects. Do you know whether or not Reclamation's overhead costs remain high or have they gone down? What does the report tell us?

Mr. KEPPEN. Well, I have only been on board for a month, so still catching up on all the multitude of reports we put together. Norm has been pretty active with Family Farm Alliance. He might want to engage on that.

I would just say specifically we are hearing some concerns of higher costs in specifically the engineering and cultural resource studies, 40 to 50 percent of constructed costs sometimes, which is pretty high. I was an engineer when I started out in the private sector and those costs generally ought to be around 15 percent or so of the magnitude of the costs that we are talking about.

Senator SMITH. Is that accurate?

Mr. SEMANKO. Mr. Chairman, in my day to day role I serve as executive director of the Idaho Water Users Association and also serve on Dan's advisory committee. We have mixed bag stories from Idaho and we are in the process of helping Dan compile those stories, and I think we would be pleased to provide those to the committee.

There is not a one size fits all answer. We are hearing good stories and bad stories and it is kind of spotty.

Senator SMITH. Also, Dan, the Family Farm Alliance has discussed many times with me the need for more water storage in the West. You are not talking about dams, but has the Alliance identified ways to create water supplies that would be available in lean years?

Mr. KEPPEN. Well, next week there is a House Resources Committee hearing that has to do I think with storage of both ground water and surface water. At that time the president of our Alliance I think is scheduled to come out and testify, and the Alliance will roll out a data base that we have been working on for the last 2 years that will basically lay out a summary of what folks at the ground level have seen on the books for a long time, projects that have been there but have not been developed.

We are not saying that this is necessarily a proposal or anything like that. But basically what we are saying is, here are some ideas and we want to use it as a basis for catalyzing the discussion on the need to enhance supplies, and also to develop other case studies that can specifically identify why these things have not moved forward so we can come back with some constructive suggestions.

Senator SMITH. Thank you all for being here.

Mr. KEPPEN. Thank you.

Senator SMITH. Thank you, Mr. Chairman.

The CHAIRMAN [presiding]. Anybody else?

[No response.]

The CHAIRMAN. Thank you very much.

Let me ask. When we were putting together a bill that we will reintroduce with modifications, that I think was bipartisan and the House was interested in also, which would set up some centers of technology and innovation excellence, we started off with a very fundamental question, which it was not easy for us to answer. That was, where should you—what department of the Federal Government should that be in?

Normally, you would think the Department of the Interior. Then you would ask, are they experts in technology and science and innovation in terms of water purification, water enhancement, and the like? So I would like to ask, do you have any ideas with reference to that? Not long answers, but where does it belong? I concluded there was no logical place, so I thought maybe it ought to be the Department of Energy since its laboratories would be the basic researchers. But we did not have unanimous feeling on that.

Anybody have an idea? We can start over there perhaps. Dan, do you have any ideas?

Mr. KEPPEN. Senator Smith's office?

[Laughter.]

Mr. KEPPEN. I would say really the Department of the Interior. A lot of the agencies within Interior I think are well suited to deal with the issue. The areas of disconnect I see: NOAA Fisheries needs to get pulled in there somehow. They are in Commerce and sometimes they are out of the loop. But I would think Interior would be the proper role if that is going to happen.

The CHAIRMAN. Anybody else?

Mr. GEORGE. Mr. Chairman, I would agree. I think if we are going to talk about water we need to go to the agencies that would be the experts in water, and I think those agencies are in the Interior.

The CHAIRMAN. Anybody else?

Mr. TYRRELL. Mr. Chairman, I tend to agree. You have some of the best water scientists in the world in the USGS and the Bureau of Reclamation. I would use them.

The CHAIRMAN. USGS?

Mr. TYRRELL. Yes.

Mr. ATWATER. The only thing I would add to that historically, for example, desalinization technology was developed by the Bureau of Reclamation in the 1960's. But your suggestion with the Department of Energy is a good one. What I had suggested earlier in my testimony, certainly there is a lot of good research at EPA, and clearly the Army Corps of Engineers has research centers that are internationally renowned.

So again, you have got to look at the collaboration and the coordination between the different Federal agencies.

The CHAIRMAN. That is really what is the important part as I saw it.

Thank you all very much. Nice to have you here. Thank you, ma'am.

The third panel, please. There are only four people on that: Mr. Bell, Mr. D'Antonio, somebody from the Nordhaus Law Firm in Albuquerque, and Mr. Echohawk.

The CHAIRMAN. Mr. Bell, I am going to just call on you and as I do I will tell them who you are: Mr. Craig Bell, Western States Water Council.

Mr. BELL. Thank you very much.

The CHAIRMAN. Thank you.

May we have order, please.

STATEMENT OF CRAIG BELL, EXECUTIVE DIRECTOR, WESTERN STATES WATER COUNCIL

Mr. BELL. We appreciate very much the opportunity to be here today.

The Council consists of representatives appointed by the Governors of 18 Western States and so we have a great interest in the subjects of this conference, no more so than the one that I will be speaking to. The Council believes that there is no more important obligation of the United States than that of its trust obligation to Native Americans and particularly their water claims, and the settlement thereof is not only important to Native Americans, but also to the country as a whole.

We support, therefore, the settlement of these claims throughout the country. In so doing, we work closely with the Western Governors Association and I am authorized to say today that the recommendations that are in the paper are also endorsed by the Western Governors Association.

We wish to commend the Congress for their approval of these settlements in the past. They have saved untold millions of dollars in public and private moneys that would otherwise go to prolonged and costly litigation.

A key component of that success has been the administration's policy to establish negotiation teams, both to achieve and implement settlements. Unfortunately, we believe funding for those teams is currently inadequate and needs to be supplemented. We would hope the Congress would do so and urge them to do so, so that particularly Native Americans can participate appropriately.

We also believe that the funding of water settlements should be a mandatory obligation of the United States. That is, that obligation is analogous to and no less serious than the obligation of the United States to pay judgments that are rendered against it, and we believe there is precedent for doing so and we have provided legislative language to do so in our written statement submitted to the committee. We believe that would be an important progress, step of progress in terms of achieving future settlements.

We believe that the settlement of Federal non-Indian reserved rights is also important. It has much to commend it. One of the ways in which these settlements can be achieved is within the context of State adjudications, and these are also costly. One of the things that complicates that is the fact that in 1992 the Supreme Court ruled that the Federal Government is exempt from paying filing fees associated with those general adjudications. This creates a hardship for other users, who have to subsidize those adjudications, including States.

We would hope that Congress would remedy that by reversing the effects of that holding, simply requiring the Federal Government to pay filing fees to the same extent as other private water

users. We believe that would be substantially helpful in funding these adjudications.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Bell follows:]

PREPARED STATEMENT OF CRAIG BELL, EXECUTIVE DIRECTOR, WESTERN STATES WATER COUNCIL

PROPOSALS

1. Provide adequate funding for Interior negotiating teams for both achieving and implementing settlements in order to facilitate increased tribal participation and significantly advance the goal of achieving water rights settlements.
2. Enact legislation to establish a funding mechanism to ensure that any land or water settlement, once authorized by the Congress and approved by the President, will be funded without a corresponding offset to some other tribe or essential Interior Department program.
3. Enact legislation to require that the federal government pay filing fees for its claims in state general adjudications to the same extent as private water users.

WHAT EFFORT SHOULD BE MADE BY THE FEDERAL GOVERNMENT TO ENCOURAGE THE ADJUDICATION OR SETTLEMENT OF INDIAN WATER RIGHT CLAIMS?

The Western State Water Council has for years actively supported the negotiated settlement of the water claims of Native Americans. The Council believes that the settlement of Native American water claims is one of the most important aspects of the United States' trust obligation to Native Americans and is of vital importance to the country as a whole. The Council adopted a policy advocating the settlement of water claims in 1986 and has maintained this policy consistently since that date.

The Congress is to be commended for its support of negotiated Indian water right settlements. Over the past 25 years, more than nineteen settlements of Indian land and water rights have been reached in the western states and approved by the Congress. These settlements have helped save untold millions of dollars of public and private monies through avoidance of prolonged and costly litigation. A key component of this success has been the Administration's efforts to establish and maintain negotiation teams for both achieving and implementing settlements. Unfortunately, the level of funding for these negotiation teams is currently inadequate to meet the needs. Moreover, a significant cut in funding is being proposed for the FY06 federal budget. Consistent with the trust responsibility of the United States to the tribes, we urge Congress to provide the necessary funding to facilitate increased tribal participation which could significantly advance our mutual goal of achieving water rights settlements.

In addition, an appropriate funding mechanism must be found for water settlements, or the Administration's settlement policy may become a nullity.

The current practice is to treat the funding of water settlements as discretionary, with the result that a settlement can only be funded with a corresponding reduction in some other discretionary component of the Interior Department's budget. The practical effect of this budgetary policy is to significantly hinder the funding of water settlements. It is very difficult for the Administration, the States or the Tribes to negotiate settlements knowing that they will only be funded at the expense of some other Tribe or essential Interior Department program.

Funding of water settlements should be a mandatory obligation of the United States government. The obligation is analogous to, and no less serious than the obligation of the United States to pay judgments which are rendered against it. We urge that steps be taken to change current policy to ensure that any water settlement, once authorized by the Congress and approved by the President, will be funded. If such a change is not made, all of these claims will be relegated to litigation, an outcome which ought not to be acceptable to the Administration, the Congress, the Tribes or the States.

The following is draft legislative language which, if enacted, would make mandatory the funding of any water settlement authorized by Congress and approved by the President. It would appropriately treat the funding of the settlement of Indian water right claims as a judgment against the United States. It is proposed as language to amend an Interior appropriations act or a supplemental appropriations act:

"Such sums as may be necessary, not to exceed $250,000,000 in any fiscal year, shall hereafter be available for payment of amounts authorized in Indian land and water claims settlement Acts, subject to the same protections and limitations as funds appropriated in satisfaction of a judgment of the Indian Claims Commission

or the United States Claims Court in favor of any Indian tribe, band, group, pueblo, or Indian community."

Historically, judgments upholding Indian claims rendered by the Court of Claims or the Indian Claims Commission have been treated and paid as were other judgments by the Court of Claims, and have not been included as part of Interior's budget. As recently as 1992, the Indian Claims Commission ruled that compensation should be paid to the tribe which it would have received related to lands taken for construction of the Grand Coulee Dam. The compensation was paid from the "judgment fund."

We acknowledge that there may be other approaches to achieving the desired result than the above language. In 1996, Congress established a trust fund to rectify the failure to perform restoration work that was supposed to have ameliorated the negative effects to the Crow Creek Sioux Tribe from the Pick-Sloan Project. The trust was funded by placing into an account at the Department of Treasury 25% of receipts from the power revenues generated by the Pick-Sloan Missouri River Basin Program every fiscal year until the total of $27.5 million is achieved. Interest on the corpus of the trust is to provide for the construction, operation and maintenance of a water system on the reservation. We look forward to exploring various approaches in resolving this vital issue.

SHOULD A SIMILAR EFFORT BE MADE TO QUANTIFY OTHER FEDERAL RESERVED RIGHTS?

A policy favoring settlement of non-Indian reserved right claims is also important, although these claims are not associated with the federal government's trust responsibility for Indian tribes. Such settlements offer advantages which include: (1) the ability to be flexible and to tailor solutions to the unique circumstances of each situation; (2) the ability to promote conservation and sound water management practices; and (3) the ability to establish the basis for cooperative partnerships. While funding for the settlement of these claims is also vital, the dynamics are somewhat different and one important aspect arises chiefly in the context of state general stream adjudications discussed below.

ARE ADJUDICATIONS AN APPROPRIATE MEANS TO QUANTIFY THOSE RIGHTS?

States in the West have developed comprehensive judicial and administrative proceedings (general stream adjudications) to quantify and document relative water rights within basins, including the rights to waters claimed by the United States under either state or federal law. These adjudications are typically complicated, expensive civil court and/or administrative actions that involve hundreds or even tens of thousands of claimants. Such adjudications give certainty to water rights, provide the basis for water right administration, reduce conflict over water allocation and water usage, and incidentally facilitate important market transactions for water rights in the West. Congress recognized the benefits of state general adjudication systems and by adoption of the McCarran Amendment (43 U.S.C. §666), required the federal government to submit to state court jurisdiction for the adjudication of its water right claims.

Although water right claims by federal agencies are often the largest and/or most complex claims in state general adjudications, the United States Supreme Court, in the case of United States v. Idaho, 508 U.S. 1 (1992), determined that the McCarran Amendment does not require the United States to pay filing fees, which pay for a portion of the costs associated with conducting adjudications. This holding means that the cost of adjudicating some of the most difficult claims in a state general adjudication has shifted entirely to private water users and state taxpayers. This drain on the resources of states and lack of federal government financial support significantly inhibit the ability of both state and federal agencies to protect private and public property interests.

This is nowhere more evident than in the Klamath Basin where approximately 400 of the 700 claims being adjudicated are federal claims. The complexity of these federal claims, coupled with a series of lawsuits filed in federal court by federal agencies, has significantly delayed the state adjudication. Further, because they are not subject to fees and costs like other water users in the adjudication, federal agencies have filed questionable claims that may have been otherwise tempered. In Idaho, for example, the Forest Service initially filed 3,700 last minute claims in the Snake River Basin adjudication just prior to the initial court action on the adjudication fee issue. After the Forest Service used these last minute claims to quantify the fiscal impact of paying fees and after the State of Idaho incurred considerable expense investigating these claims, the Forest Service withdrew all but 61 of the claims, and the state adjudication court has since dismissed all but 9 of the claims.

With this background, the western states have attempted to address this problem in the Congress. Bills have been introduced in Congress that would require all federal agencies filing water right claims in state adjudications to pay fees and costs to the same extent as a private party to the same proceeding. New Mexico proposed alternative legislation to provide federal funding support to each of the states pursuing general stream adjudications, based on a formula assessing the relative need for such support. These proposals have not advanced within Congress. We urge you to address this inequity. Payment of filing fees by federal agencies was in fact a common practice prior to the unfortunate U.S. Supreme Court ruling on the Forest Service claims in Idaho.

In addition, while not within this Committee's jurisdiction, it should also be noted that varying Tribal water quality standards (as well as the lack thereof) and checkerboarded reservations, raise serious state concerns over administration—on and off the reservations—which have yet to be resolved. In order to prevent voids in regulation, state water quality standards should be effective on Indian lands until replacement standards have been adopted by tribal governments which are treated as states, or promulgated by EPA. Congress should provide direction that will aid in cooperative resolution of water quality issues. All efforts should be made to develop consistent tribal/state water quality standards at adjoining jurisdictional boundaries.

The CHAIRMAN. Thank you very much.

We are very pleased to have the State Engineer from the State of New Mexico, John D'Antonio. You do not have the easiest job in the world. It is a hard trip up here, but I imagine it is a little reprieve from what you go through every day out there in the State. But we think you are doing a great job, and thank you for coming and sharing your views with us.

STATEMENT OF JOHN D'ANTONIO, NEW MEXICO STATE ENGINEER

Mr. D'ANTONIO. Thank you, Mr. Chairman, members of the committee.

Again, three issues that I want to stress up front: funding Indian water rights without a corresponding reduction in Department of the Interior funding is very important; fulfilling the U.S. trust responsibilities to tribes and avoid liability issues is a big benefit. I know the benefit is the sense of community and harmony within the basin among all water users because of certainty of water rights, and that includes economic benefits.

The completion of water rights adjudication is a priority for New Mexico. New Mexico supports settlement of Indian water right claims and Federal reserved water right claims. The cooperation from the Federal Government is essential to bring closure to New Mexico's settlement negotiations. The direct benefits of completing the adjudication of Indian water rights and Federal reserved rights include the removal of a barrier to economic development for both Indians and non-Indians and also savings to all parties on the high costs of protracted litigation.

The need in New Mexico is acute. We have 22 tribes, nations, and pueblos within the State. Only one, the Jicarilla Apaches, have been fully adjudicated. The remaining claims, they have senior water rights, they have a priority on a large quantity that, if recognized and fully exercised, could displace significant numbers of non-Indian users that have State-based water rights.

New Mexico's legislature is now considering legislation to establish an Indian water rights settlement fund. That is in order to comply with the State's portion of funding obligations, and I believe that bill was signed in New Mexico today. It was scheduled to be

signed today. New Mexico, however, will not succeed unless there is a corollary effort by the Federal Government as far as funding goes.

Federal action and inaction has contributed to uncertainty on settlements. There are shifts in Federal policy through implication that may reserve water without an actual appropriation. Lately we have had limited participation by DOJ and DOI in recent negotiations on the Aamodt and the Abeyta adjudications, and it makes sessions non-substantive. The Federal Government is unwilling to contribute to more than a fraction of the total proposed settlement cost and that is recently with the Aamodt case, and that causes extreme dissatisfaction to the negotiation process and again causes problems there.

It would not be helpful or advisable for Congress to attempt quantification of Indian and Federal reserved rights outside the existing general stream adjudication process.

New Mexico is proud of its accomplishment in negotiating a settlement agreement with the Navajo Nation, which was completed in December 2004. While the settlement provides for water rights and associated water development projects in New Mexico for the Navajo Nation, the Navajo Nation releases claims to water that would displace existing non-Navajo water users in the San Juan Basin. This cost is about $800 million in 2005 dollars to the Federal Government. State, and local contributions total upwards of $160 million.

In closing, again the three points I would like to stress: the funding of Indian water rights settlements without corresponding reduction in DOI funding is essential; benefits include fulfilling the U.S. trust responsibilities to tribes and avoiding liability issues; and also, the sense of community and harmony within the basin among all the users because of certainty of water rights is essential.

Thank you, Mr. Chairman.

[The prepared statement of Mr. D'Antonio follows:]

PREPARED STATEMENT OF JOHN D'ANTONIO, NEW MEXICO STATE ENGINEER

TOPIC 3: INDIAN AND FEDERAL RESERVED WATER RIGHTS

The determination and quantification of Indian and federal reserved water rights is a matter of critical importance to all citizens, Indian and non-Indian alike, of the western states. This is an area where Congressional action can achieve direct and substantial benefits.

Completion of water rights adjudications is a priority for New Mexico. Toward that end, New Mexico supports settlement of Indian water rights claims and federal reserved water rights claims. New Mexico has recently completed the negotiation with the Navajo Nation of a settlement of the Nation's claims for water rights in the San Juan River Basin in New Mexico, and is in the process of negotiating other Indian water rights settlements. Based on experience, New Mexico understands the difficulties of negotiating a settlement that must take into account competing demands for a finite resource. New Mexico also understands the need to balance the uncertainties of litigation against the challenges of meeting the needs of opposing interests. Cooperation from the federal government is essential to bringing closure to New Mexico's ongoing settlement negotiations and to resolving the many outstanding Indian and federal reserved water rights claims that exist in our state.

1. DETERMINATION OF INDIAN WATER RIGHTS CLAIMS AND FEDERAL RESERVED WATER RIGHTS CLAIMS

A. The direct benefits of completing the adjudication of Indian water rights claims and federal reserved water rights claims are significant. They include the removal of a barrier to economic development for both Indians and non-Indians, and the savings to all parties of the high costs of protracted litigation. These benefits would accrue to the nation as a whole.

B. In New Mexico, the need for the adjudication of Indian and federal water rights claims is acute. The lands of 22 Indian Tribes, Nations, and Pueblos lie within the borders of New Mexico. Of these, only the water rights of the Jicarilla Apaches have been fully adjudicated. The remaining Indian claims are typically to water rights of such senior priority and large quantity that, if recognized and fully exercised, they could displace significant numbers of non-Indian water rights developed under state law. In one instance, the claims of the Navajo Nation are potentially so large that they could exceed New Mexico's apportionment under the Upper Colorado River Basin Compact.

Based on an understanding of the importance of Indian water rights settlements, the New Mexico legislature is now considering legislation to establish an Indian Water Rights Settlement Fund. This fund would provide a mechanism for the state to comply with its funding obligations under potential Indian water rights settlements. This legislation recognizes the need for New Mexico to plan ahead to make the Indian water rights settlements successful, but New Mexico's efforts will not succeed without a corollary effort on the part of the federal government. Notwithstanding the current federal budget difficulties, the federal government needs to prioritize settlement and funding relating to Indian water rights.

C. Federal action and inaction have contributed significantly to the considerable uncertainty surrounding Indian and federal water rights claims. This uncertainty accentuates the present urgent need for those claims to be adjudicated.

In New Mexico, it is easy to see how actions and inaction of the federal government have contributed to the present uncertainty over the water rights claims of Pueblo Indians. It is well known, for example, that the early U.S. Supreme Court case of *U.S.* v. *Joseph*, 94 U.S. 614 (1876) (in which the Pueblo Indians were determined not to be "Indians" for purpose of the Non-Intercourse Act, with the consequence that they could own and alienate their lands, which they did), followed by the Court's 1913 decision in *U.S.* v. *Sandoval*, 231 U.S. 28 (which reversed *Joseph,* finding that the Pueblos were, and always had been, subject to and benefited by the Non-Intercourse Act), threw into doubt the validity of some forty years of real estate transactions involving lands within Pueblo grants. In addition, the attempts by Congress to address the problem, by the Pueblo Lands Act of 1924 and the 1933 Act, were wholly inadequate.

The federal government also has contributed to the uncertainty surrounding the water rights claims of Indian Nations and Tribes other than the Pueblos, and of the federal government. Federal actions or policies that have contributed to this include the creation and dissolution of Indian reservations, periodic recurrence of radical shifts in federal Indian policy, and other federal actions which may "impliedly" reserve water without an actual appropriation.

D. It is therefore appropriate for the United States to provide substantial support to promote the completion of adjudication of Indian and federal reserved water rights claims, by both settlement and litigation.

E. Congress helps enormously, of course, by legislative approval and funding of successful Indian water rights settlements, and this expectation of United States support is usually critical to achieving a settlement.

New Mexico is proud of its accomplishments in negotiating a Settlement Agreement with the Navajo Nation. The Settlement was completed in December 2004 after years of negotiations and resolves the claims of the Navajo Nation to the use of waters of the San Juan River Basin in New Mexico in a manner that would inure to the benefit of the Navajo Nation and the State of New Mexico. The negotiating parties made great efforts to provide information to the public and third parties regarding the Settlement and to take comments into account in finalizing the Agreement.

The Settlement provides water rights and associated water development projects for the benefit of the Navajo Nation in exchange for a release of claims to water that potentially might otherwise displace existing non-Navajo water uses in the San Juan River Basin in New Mexico. Along with the Settlement Agreement, the parties have negotiated: 1) a proposed court decree for entry in the San Juan River Adjudication setting forth the rights of the Navajo Nation to use and administer waters of the San Juan River Basin in New Mexico; 2) a proposed Settlement Act for Con-

gress to authorize the Bureau of Reclamation to construct and operate the Navajo-Gallup Water Supply Project, to fund the Bureau of Reclamation to complete and rehabilitate Navajo water projects in the San Juan River Basin in New Mexico, and to approve the Settlement Agreement and other authorizations to secure to the Navajo Nation a water supply to meet the needs of the Nation and its members; and 3) a Settlement Contract to provide for deliveries to the Navajo Nation under Bureau of Reclamation water projects, namely the Navajo Indian Irrigation Project, the Navajo-Gallup Water Supply Project, and the Animas-La Plata Project. Continued cooperation from the federal government will be critical to ensure the benefits of this settlement can be achieved.

In addition, under the Settlement, the federal government is responsible for providing approximately $620 million of the funding necessary to implement the settlement. The state is responsible for funding an additional $35 million and local parties and the Jicarilla Apache Nation are responsible for yet another $131 million. This level of funding represents a reduction from the amounts originally proposed, and New Mexico expects that the federal government will cooperate in enabling the Settlement to progress.

F. Unfortunately, participation by the Departments of Justice and Interior in recent negotiations to resolve Indian water rights claims in New Mexico has been perfunctory and non-substantive.

In addition to the Navajo settlement, New Mexico is in the process of negotiating settlements in the *Aamodt* adjudication, in the Nambe-Pojoaque-Tesuque area, and the *Abeyta* adjudication, in Taos, both of which are long-standing water rights adjudication suits. In the *Aamodt* case, which has the distinction of being the oldest active case in federal court, settlement negotiations have been proceeding for over four years, and while the federal government participated in the negotiations through the Justice Department, recent public pronouncements that the federal government is unwilling to contribute more than a fraction of the total proposed settlement costs have caused extreme disruption to the negotiation process. It is unreasonable for the federal government to attend settlement discussions without meaningful participation, and to withhold substantive comments until a settlement is finalized and legislation is introduced before Congress. New Mexico is encouraged by the recent appointment of Jennifer Gimbel within the Department of the Interior to oversee Indian water rights settlements, and looks forward to working closely with her within the next few years to finalize the settlements under negotiation and obtain the necessary congressional support. New Mexico is also supportive of the comments made on this issue by the New Mexico delegation during the Senate Energy and Natural Resources Committee hearing on the Fiscal Year 2006 Interior Department budget.

G. In most of the west, and certainly in New Mexico, it is crucial that all Indian and federal water right claims be adjudicated. The surface waters of New Mexico's streams were fully appropriated years ago, and the competing demands on the state's available water supplies do not allow the luxury of putting off quantification questions. The adjudication of reserved water right claims asserted by the federal government should be made a priority along with the adjudication of Indian water rights claims.

Recommendations

1. Congress should make clear that the timely adjudication of Indian water rights and federal reserved water rights is an important priority of the United States deserving of special attention from the Departments of Justice and Interior.

2. Congress should support the timely adjudication of Indian and federal reserved water rights at all levels of the process, by any available means, including:

- providing sufficient funding for, and the specific direction to use, federal technical expertise and assets (through the USBOR, USGS, etc.) to aid settlement negotiations; and
- requiring, as a condition of funding, annual reporting on the progress of achieving Congress' goal of timely adjudication of Indian and federal reserved water rights.

3. Congress should fund settlements of Indian water rights claims without requiring corresponding reductions in Department of Interior programs.

2. ROLE OF WATER RIGHTS ADJUDICATIONS

A. General stream adjudications, legislatively prescribed and undertaken by the states, are the indispensable tool for the determination of all competing water rights claims in a stream system. The needs and the history of each state are different, and the general stream adjudication process has taken different forms in different states, from quasi-administrative to strictly judicial, but all should be supported as

no other viable alternative exists for the determination of federal and Indian water rights claims alongside competing water rights claims developed under state law. In New Mexico, where unappropriated water on its major rivers ceased to exist long ago, no other mechanism exists to determine the water rights of all parties. The adjudication of water rights is a process that must succeed for the benefit of all. The more timely this process is completed, the better.

B. It would not be helpful or advisable for Congress to attempt quantification of Indian and federal reserved water rights outside the existing general stream adjudication process. While that process has sometimes suffered from delays and lack of needed resources, it is the only process which can legitimately determine all water rights claims in a basin in a fair and principled manner, and it is the process which Congress has explicitly approved with the passage of the McCarran Amendment.

Recommendations

1. Congress should support the water rights adjudication process generally, including by:

- providing sufficient funding for the federal judiciary's special needs in water rights adjudications, such as Special Masters, and specialized clerk and support staff; and
- providing funding for the continuance of adjudication and administration efforts by the states, many of which are struggling to cope with the burdens of adjudicating and administering water rights.

2. Attempts to quantify Indian water rights and federal reserved water rights outside the existing general stream adjudication process should be avoided.

The CHAIRMAN. Thank you very much.

Now we have down here a Nordhaus Law Firm member. That is you, Steve?

Mr. GREETHAM. "GREET-ham."

The CHAIRMAN. "GREETH-im"?

Mr. GREETHAM. Yes. The pig welcomer, "Greet Ham."

The CHAIRMAN. "Greet-ham," okay.

STATEMENT OF STEPHEN GREETHAM, THE NORDHAUS LAW FIRM, ON BEHALF OF THE PUEBLOS OF LAGUNA, SANTA ANA, SANTO DOMINGO, AND TAOS

Mr. GREETHAM. Thank you very much, Senators, Mr. Chairman.

I am here on behalf of the Pueblos of Laguna, Santa Ana, Santo Domingo, and Taos today. My firm also represents the Jicarilla Apache Nation, which has been referred to. They have already completed a successful settlement of their water rights.

The questions that the committee has asked fundamentally turn on whether an adjudication is the appropriate way to proceed. An adjudication is essentially the only tool we have, and by that I mean a court decree declaring one's property rights in water. The real issue gets to whether sole reliance on litigation or a negotiated approach is the appropriate way to go, and I think New Mexico gives us some sad examples of exclusive reliance on litigation.

Aamodt and Abeyta, two of the oldest Federal cases in the country, are 35, 39 years old respectively, dealing with five tribal claims in addition to the affected non-Indian communities. The Rio San José Basin is a State court adjudication that was filed in 1982 and not a single water right has yet been adjudicated in that action. This is simply a pace that is not keeping up with the increasing demands that are being placed on water supplies throughout the West.

I have to say that the discussion so far talking about making increased supplies available will still not address the allocation of

those supplies as among the different communities and individuals within any system.

Contrasting the litigation track record, the negotiation track record in New Mexico gives a lot of reason for hope. The Jicarillas completed their settlement on one basin in 1998, another in 1999, and since the completion of the decree, the negotiated decree on their rights, they have entered into the water market as an economic player, which has benefited both the non-Indian users in providing senior sources of supply for municipal growth and economic development on the part of the Jicarillas.

Aamodt and Abeyta are both pushing through. Those are two large settlements in northern New Mexico and they are both preparing to come back to D.C. for the second phase of the negotiation process.

What role can Congress play, has been touched on. It was interesting that all of our comments touched on the same issues: money. The negotiation process is expensive and time-consuming. The technical expertise, the legal requirements, require extensive resources. Taos Pueblo over the past year and a half has been in an intensive negotiation effort. They met 120 times in face to face negotiation sessions last year and they are hundreds of thousands of dollars in debt, both to their in-house staff and to their technical consultants.

Because of the Federal trust responsibility and because of the sprawling public interests in resolving the quantification of senior tribal water rights, the Federal Government—the easiest thing the Federal Government can do is to provide the resources to complete these efforts. On top of that, right now we operate in accordance with the 1990 settlement guidelines that the Department of the Interior promulgated after the first President Bush enacted the Indian Tribes Settlement Act. Congress should step in and declare the priority as well. To the extent Federal legislation is to be pursued to deal with Indian water rights issues, Congress should set the tone as far as declaring the priority in Federal policy to resolve these quantifications and a preference for true intergovernmental negotiated resolutions of the claims.

Thank you.

[The prepared statement of Mr. Greetham follows:]

PREPARED STATEMENT OF STEPHEN GREETHAM, THE NORDHAUS LAW FIRM, ON BEHALF OF THE PUEBLOS OF LAGUNA, SANTA ANA, SANTO DOMINGO, AND TAOS

THE UNITED STATES MUST DEDICATE INCREASED RESOURCES TO THE RESOLUTION OF TRIBAL WATER RIGHTS CLAIMS AND DECLARE THAT EFFORT TO BE A FEDERAL POLICY PRIORITY

These comments—which are submitted by the Nordhaus Law Firm on behalf of the Pueblos of Laguna, Santa Ana, Santo Domingo, and Taos—address two portions of the Committee's third question: (1) what effort should be made by the federal government to encourage adjudication or settlement of Indian water rights claims?; and (2) are adjudications an appropriate means to quantify those rights?

1. Tribal Water Rights Claims Must Be Resolved

Resolution of outstanding tribal water rights claims is a critical priority throughout the West, both for the affected tribes and the states in which they are located. There is no dispute that Indian tribes possess the most senior water rights in the West. *See, e.g., New Mexico* v. *Aamodt*, 537 F.2d 1102 (10th Cir. 1976); *New Mexico, ex rel., State Engineer* v. *Aamodt, et al.*, 618 F. Supp. 993 (D.N.M. 1985). Without a lawful quantification of those rights, however, efforts to manage water use in this

arid region are profoundly hampered, and that has induced the State of New Mexico to declare the resolution of tribal water rights claims to be a critical state priority. See generally New Mexico State Water Plan at 11, 64-65 (Dec. 23, 2003) (available at *http://www.seo.state.nm.us/water-info/NMWaterPlanning/2003StateWaterPlan.pdf*); *cf. id.* at § E. Furthermore, regardless of planning and management difficulties, the absence of finality with respect to the scope and extent of tribal water rights unfairly undermines tribal efforts to develop those resources and to pursue desperately needed collective economic benefits, and the longer it takes to obtain finality, in fact, the more pressure there is on scarce water supplies that could otherwise satisfy tribal rights. The bottom line is that until outstanding claims are resolved, both the Indian and non-Indian communities throughout the West will be burdened by unnecessary conflict and uncertainty. *See generally* Western Water Policy Review Comm'n, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY (June 1998).

2. Exclusive Reliance on Litigation Efforts Is Inefficient

The Committee has asked whether adjudication is "an appropriate means" for the quantification of water rights, and the general answer has to be "yes." Under relevant state law, *see generally* NMSA 1978, § 72-4-15 (1907), and the McCarran Amendment, 43 U.S.C. § 666, the quantification of any right to water located within New Mexico, including tribal rights, must be decided by a court; indeed, absent an appropriate court order, the protection of those property interests may be compromised. *See, e.g., United States* v. *Bluewater-Toltec Irr. Dist.*, 580 F. Supp. 1434 (D.N.M. 1984), *aff'd*, 806 F.2d 986 (10th Cir. 1986). However, the fact that adjudication may be considered "appropriate" does not end the discussion.

For example, the adjudication of water rights by exclusive reliance on litigation has, by no means, proven efficient. For example, the *Aamodt* and *Abeyta* adjudications, which the state filed in federal court more than 35 years ago, have so far failed to produce a quantification of the water rights separately held by the Pueblos of Nambe, Pojoaque, San Ildefenso, Taos, or Tesuque. Similarly, although litigation was initiated more than 20 years ago to adjudicate all rights to the waters of the Rio San José, the state court in the *Kerr-McGee* adjudication has so far not entered a single interim order determining any non-Indian water right, nor did it order an expedited *inter se* subproceeding on the rights of the Pueblos of Acoma and Laguna until 2002. Procedural issues in that subproceeding continue to consume the parties' and the court's energies. In *Abousleman*, which will adjudicate the rights of the Pueblos of Jemez, Santa Ana, and Zia, the federal court ruled only last summer on cross-motions for summary judgment that were filed in [1989]. It is troubling that all of these actions relate to the adjudication of water rights on tributaries to the Rio Grande; at this time, there is no publicly known plan to commence a general adjudication of rights to the waters of the Rio Grande main stem, an action that could affect almost all of the federally recognized Indian tribes in New Mexico. One can only imagine how long such a comprehensive court action would take to complete.

Adapting to these legal realities and consistent with the Interior Department's 1990 guidelines, 55 FED. REG. 9223 (Mar. 12, 1990), tribes have not relied exclusively on litigation. For example, the Jicarilla Apache Nation successfully concluded negotiations on a final settlement of its rights in the San Juan and Rio Chama basins in 1998 and 1999. The eight Pueblos that are party to the *Aamodt, Abeyta*, and *Abousleman* adjudications have likewise pursued a negotiated resolution of their claims, and at present, the *Aamodt* and *Abeyta* Pueblos are nearing closure on the local phase of those efforts. The Pueblos of Acoma and Laguna, on the other hand, have been unable to obtain sufficient attention from the United States for more than the most preliminary of discussions with the current federal negotiation team assigned to the *Kerr-McGee* adjudication. Largely due to a scarcity of resources, those negotiation efforts have proceeded slowly, when they have proceeded at all.

The inefficiencies of relevant state law adjudication processes or the federal administrative negotiation guidelines do not necessarily constrain options for how to proceed with the quantification of tribal water rights. As the courts have stated, Congress has not abandoned tribal water rights to state law control or otherwise compromised the controlling authority of federal law with respect to those rights. *See, e.g., Arizona* v. *San Carlos Apache Tribe*, 463 U.S. 800 (1976); *Aamodt*, 537 F.2d 1102. Accordingly, as discussed in the next section, Congress can-and should-act to improve the quantification process by declaring a federal priority for the resolution of tribal water rights, authorizing increased funding for the litigation and negotiation processes, and requiring the formal promulgation of clearer and more substantive guidance for intergovernmental water rights negotiations. Such an act would be appropriate given Congress' plenary authority over Indian affairs and, par-

ticularly, in light of the United States' trust responsibility with respect to the protection of tribal water rights.

3. Congress Should Declare the Resolution of Tribal Water Rights a Critical Federal Priority and Require the Dedication of Adequate Financial and Human Resources for the Fair Quantification of Tribal Water Rights

Fifteen years ago, the United States declared its preference for the negotiated resolution of tribal water rights. *See* 55 FED. REG. 9223. Congress and the Administration must back that preference with a commitment of the funding and human resources necessary to bring these critical and complex efforts to fruition. The simple truth is that these efforts are expensive, especially for tribal governments that are too often hamstrung by insufficient financial resources. In the *Abeyta* negotiations, for example, Taos Pueblo's negotiation team, which includes paid tribal staff members as well as legal and technical consultants, has had to attend almost 120 negotiation sessions during 2004. In January 2005, alone, the Pueblo team met in *Abeyta* negotiation sessions 21 out of 31 days. This recent pace, which was urged by the federal court and which was critical to the dramatic progress that the parties made last year, has required a tremendous dedication of resources. However, due to insufficient federal funding, the Pueblo was forced to allocate funds to the settlement effort at the expense of other essential Pueblo programs, and substantial work performed in this effort remains unpaid due to a lack of funds.

Throughout the West, tribes have had no alternative but to commit scarce tribal funds on the quantification of their water rights, and the United States has not matched that tribal commitment, either in terms of funding or human resources. Recently, there has been much public attention paid to the Justice and Interior Departments' refusal to offer more than $11 million for the *Aamodt* settlement, a figure that pales in comparison to the settlement's estimated cost of more than $200 million. Furthermore, the Justice Department has tasked only one Denver-based attorney to represent fifteen of the Indian tribes in New Mexico that are currently engaged in litigation and/or negotiation over their water rights. No matter the skill of this able and committed attorney, his task is daunting. These brief examples represent the insufficiency of the federal commitment to the timely and fair resolution of tribal water rights claims.

Finally, while financial and human resources are desperately needed for the successful and fair quantification of tribal water rights, Congress should also provide guidance and greater clarity as to *how* those resources could be most effectively and efficiently deployed. Through appropriate legislation, for example, it could:

- declare that the resolution of outstanding tribal water rights claims is a federal priority;
- declare that the policy of the United States is to seek resolution of tribal water rights claims through intergovernmental (federal-tribal-state) negotiation;
- require that the Interior and Justice Departments develop and implement plans for the completion of litigation or negotiation of those claims;
- require that the Interior Department actively commence its representation of the United States in any tribal water rights negotiation at the earliest possible stage;
- establish a fund outside of the Interior Department annual budget and appropriate to it sufficient money to cover annual federal and tribal costs arising from ongoing quantification efforts; and
- similar to what the New Mexico Legislature is presently considering, establish a tribal water rights settlement fund and appropriate to it sufficient money to cover the costs of implementing future settlements.

To provide greater clarity to the negotiation process, such legislation should also direct the Interior Department to promulgate regulations that:

- establish how timely intergovernmental negotiations for the quantification of tribal water rights should be commenced and conducted;
- standardize the "shape of the table" to preserve and facilitate the intergovernmental (federal-tribal-state) nature of these efforts;
- establish a uniform threshold scope for these efforts to encourage an appropriate and realistic focus; and
- establish standardized procedures for developing timely administrative policy on specific issues as they arise in negotiations.

The Pueblos do not propose a radical overhaul of the present negotiations process; nonetheless, the current administrative guidelines for the negotiated settlement of tribal water rights are too vague to provide adequately uniform direction or to facilitate timely progress. And perhaps more importantly, administrative guidelines do not carry the full weight of the United States' endorsement or authority, and such

gravity would be appropriate in matters as critical as those affecting tribal trust resources.

The CHAIRMAN. Thank you very much.

Mr. John—would you tell me how to say your last name?

Mr. ECHOHAWK. "Echo Hawk."

The CHAIRMAN. Echohawk. We look forward to hearing from you.

STATEMENT OF JOHN ECHOHAWK, EXECUTIVE DIRECTOR, NATIVE AMERICAN RIGHTS FUND

Mr. ECHOHAWK. Thank you, Mr. Chairman.

I am the executive director of the Native American Rights Fund and we have been involved in Indian water rights litigation and settlements for 35 years. We are currently representing three tribes in that regard.

I am also here on behalf of the National Congress of American Indians and the tribal representatives of the joint Federal tribal Indian water funding task force. As you know, Indian water rights is one of the most important issues to the tribes out there. You know that tribes are sovereign governments and each tribe reserves to itself the right to decide how to resolve its Indian water rights claims, whether that be through litigation or negotiation or through some other avenue.

I think we are in agreement, those tribes involved in these negotiations, that what we need to focus on and what we would recommend to the committee is a focus on creating a funding mechanism to do that. Under the current system, funding of Indian water rights settlements is discretionary. So that means when we are negotiating these settlements we have to find money in the Interior budget somehow, and that is not very easy and that is a stumbling block that we face in terms of trying to reach settlements in these cases.

What we would propose is that funding of these Indian water rights settlements be made mandatory. You may recall, Mr. Chairman, in the 107th Congress we worked with you to put together such a mechanism, providing for relief from the Budget Act so that appropriations for these settlements would not be scored against the budgets of the appropriators under the Budget Act.

Since we do not have the Budget Act, I think it would behoove us all to try to find another, similar kind of funding mechanism that would accomplish the same thing. Some kind of annual automatic appropriation up to $250 million as we proposed in our proposal is I think a mechanism that we could look at, in effect a judgment fund for Indian land and water claim settlements, the $250 million figure based upon where we were at historically back in the 1970's when the settlement of these claims really got going. We think that is the way that we should go and that is what we would recommend to the committee.

Finally, I would also point to the issue that Steve was focusing on and that is the need for funds for these tribes to be able to come to the negotiating table. So many of them do not have the resources to do that. Again, the funding to the Bureau of Indian Affairs for this purpose is very, very limited. Whatever funds come that way end up supporting litigation and the tribes who are ready to enter

into negotiations are really left without the resources to do so. This of course also holds up this whole process of settling these claims.

I would urge the committee to focus on those two areas, and again I appreciate the invitation to be here.

[The prepared statement of Mr. Echohawk follows:]

PREPARED STATEMENT OF JOHN E. ECHOHAWK, EXECUTIVE DIRECTOR, NATIVE AMERICAN RIGHTS FUND; JACQUELINE JOHNSON, EXECUTIVE DIRECTOR, NATIONAL CONGRESS OF AMERICAN INDIANS; AND BRUCE SUNCHILD, CO-CHAIR, JOINT FEDERAL-TRIBAL INDIAN WATER FUNDING TASK FORCE

TOPIC #3: INDIAN AND FEDERAL RESERVED WATER RIGHTS

PROPOSALS

a. Enact legislation to establish a funding mechanism to ensure that any Indian land or water settlement, once authorized by the Congress and approved by the President, will be funded without a corresponding offset to other tribal programs or essential Interior Department programs.

b. Provide increased funding for Interior Department tribal programs that support tribal participation in settlement negotiations in order to facilitate increased tribal participation in negotiations and significantly advance the goal of achieving water rights settlements.

DISCUSSION

What effort should be made by the federal government to encourage the adjudication or settlement of Indian water rights claims?

The Native American Rights Fund, the National Congress of American Indians and the Indian Representatives on the Joint Federal-Tribal Indian Water Funding Task Force believe that the resolution of Indian water claims is one of the most important aspects of the United States' trust obligation to Native Americans and is of vital importance to the country as a whole. As sovereign governments, each tribe decides for itself how its water rights claims will be resolved and the federal government should honor that decision. We support those tribes who have decided to resolve their water rights claims through negotiated settlements, and those who are either pursuing litigation or have decided to wait to address their water rights issues.

We commend the Congress and the Administration for recognizing that settlement of Indian water rights claims is an obligation of the United States government and for encouraging the settlement of those claims. However, an appropriate funding mechanism must be found for Indian water rights settlements or the settlement policy will become a nullity.

The current practice is to treat the funding of Indian water settlements as discretionary, with the result that a settlement can only be funded with a corresponding reduction in some other discretionary component of the Interior Department's budget. The practical effect of this budgetary policy is to significantly hinder the negotiation and funding of new settlements. It is very difficult for the federal government, the tribes, the states and private parties to negotiate settlements knowing that they will only be funded at the expense of other tribes or essential Interior Department programs.

We would note that Congress has given serious consideration to proposals to take Indian water settlements off-budget. In the 107th Congress, Chairman Domenici introduced S. 1186, that provided a budgetary mechanism to ensure that funds will be available to satisfy the Federal Government's responsibilities with respect to negotiated settlements of disputes related to Indian water rights claims and Indian land claims. S. 1186 is important legislation that deserves additional consideration by the Energy and Natural Resources Committee.

Funding of Indian water rights settlements should be a mandatory obligation of the United States government. The obligation is analogous to, and no less serious than, the obligation of the United States to pay judgments which are rendered against it. We urge that steps be taken to change the current policy to ensure that any Indian water rights settlement, once authorized by the Congress and approved by the President, will be funded. If such a change is not made, all Indian water rights claims will have to be litigated or languish, an outcome which ought not to be acceptable to the federal government, the tribes, the states and private parties.

The following is draft legislative language which, if enacted, would make mandatory the funding of any Indian water rights settlement authorized by Congress and

approved by the President. It would appropriately treat the funding of the settlement of Indian water rights claims as a judgment against the United States. It is proposed as language to amend an Interior appropriations act or a supplemental appropriations act:

> "Such sums as may be necessary, not to exceed $250,000,000 in any fiscal year, shall hereafter be available for payment of amounts authorized in Indian land and water claims settlements Acts, subject to the same protections and limitations as funds appropriated in satisfaction of a judgement of the Indian Claims Commission or the United States Claims Court in favor of any Indian tribe, band, group, pueblo, or Indian community."

Historically, judgments upholding Indian claims rendered by the Court of Claims or the Indian Claims Commission have been treated and paid as were other judgments by the Court of Claims, and have not been included as part of Interior's budget. We acknowledge that there may be other approaches to achieving the desired result and suggest that such funding mechanisms might be considered in joint oversight hearings with the Senate Indian Affairs Committee.

We also urge increased funding for the Interior Department to facilitate tribal participation in Indian water rights settlement negotiations. Without tribal participation in negotiations, settlements can never be reached. Too often the lack of funding slows the negotiation process or prevents tribes from negotiating at all. The limited Interior Department funding that does exist is prioritized for litigation and negotiations suffer. We urge Congress to provide increased funding that will facilitate increased tribal participation in water settlement negotiations and significantly advance the goal of achieving water rights settlements.

The CHAIRMAN. Thank you very much, all four of you.

Senator Bingaman, did you have anything you would like to ask?

Senator BINGAMAN. Thank you, Mr. Chairman.

Let me ask our State Engineer, John D'Antonio. You have some fairly strong statements here in your testimony, which I appreciate. You say: "Unfortunately, participation by the Departments of Justice and Interior in recent negotiations to resolve Indian water rights claims in New Mexico has been perfunctory and non-substantive."

Then a little later you say: "It is unreasonable for the Federal Government to attend settlement discussions without meaningful participation and to withhold substantive comments until a settlement is finalized and legislation is introduced before Congress." Then you go on to talk about how you are encouraged that Jennifer Gimbel has been appointed to oversee this set of issues.

One point that Senator Salazar made when we had a budget hearing on the Department of the Interior budget earlier this year was that we have got a systemic problem in the Department of the Interior, in that every time you put somebody in this kind of a key position, responsible for working on these negotiations, if they prove capable they are promoted to another job, and therefore the position is vacant again.

The current Solicitor, Sue Ellen Wooldridge, was in this job and then she was—it was determined that she was capable, so they promoted her to a different position. She is now the Solicitor. That was the comment Senator Salazar made, as I understand it or as I recall it.

Do you think that is a fair comment? Do you think there is something else that we could be trying to do here at the Federal level to get a consistent level of expert involvement by the Department of the Interior on these important issues?

Mr. D'ANTONIO. Mr. Chairman, Senator Bingaman, our frustration in New Mexico—and again, we are actively involved in three water rights settlements, the Aamodt which has been—it is the

longest Federal lawsuit that is out there. And then we have the Abeyta adjudication also, which is in the Taos area.

What we have seen is, the most frustrating part is negotiating for 3 or 4 years thinking that there is a level of involvement, especially on the funding side, from the Federal Government, and going through a set of plans, which again in most cases in order for us to settle Indian water rights we have to give something up in order that the tribes or pueblos give up a future right to water. So it evolves into the Federal Government funding water projects essentially in the case of the Aamodt settlement. Obviously, a regional water system is essential. It was above $200 million.

When parties are negotiating for longer than 4 years, but substantively for the last 4 years, and then all parties thinking there is going to be a nexus of $200 million there and the Federal Government comes in and says: we think perhaps there may be only $11 million to do it. It really throws a wrench into what progress has been made.

I understand budget issues. I understand that the budget is a big concern for everybody. But I also understand that the certainty of those water rights settlements is going to enable us to move forward in every aspect of the State in terms of certainty for economic growth and our ability to allow us to market water amongst different parties.

I am not sure I am answering your question fully here. I know Jennifer Gimbel is somebody that we have a lot of confidence in. We have worked with her closely, her being from Colorado, on other issues in other areas, and we think engaging her in some of the Indian water rights settlements discussions is only going to help.

Senator BINGAMAN. Thank you.

The CHAIRMAN. Senator.

Senator MURKOWSKI. Thank you, Mr. Chairman.

We do not have any Indian water rights issues in my State, so I am listening very attentively to the concerns and the problems that you have raised. I had to lean over to my colleague the chairman here and say: I cannot believe that they have been trying to work through these settlements and this litigation for 25, 35 years, and it is still hanging out there.

You have all cited the need for some funding at this end to kind of provide for the push. But other than the I guess it was $250 million annually that I understand was in Chairman Domenici's legislation that he had introduced in the 107th, there has not really been any discussion of what would be sufficient, what would be adequate.

If you can tell me what you think would be adequate, tell me how we push it over the edge so that you do not have these settlements continuing for yet another 25 years? Just because you have the funding there does not necessarily mean that there is the impetus to resolve.

Mr. ECHOHAWK. I think the experience we have had in these Indian water rights cases is that in most instances the parties, once they come together, are going to be able to figure out a resolution on the ground, how they can all live together, how to make this thing work, because we are dealing with a situation where tribes

generally have the senior rights and water rights holders under State law had rights that most of the time are junior to the tribes. The question is how to put those two together.

We have the U.S. Government in the middle, having a role as trustee. They have not protected the tribal water rights, but at the same time they have encouraged the States to go ahead and develop water under State law. So the Federal Government plays a major role here and they need to be able to step up to the plate and fund their fair share of a settlement.

They have not been able to do that in each and every case, and that is the basic problem that we have. That is why this funding mechanism that I proposed is the best way, because that is usually the reason the government cites for not being able to support a settlement, is the lack of funding.

Senator MURKOWSKI. Maybe I am confused. There is the funding for the settlement, but I thought you were also looking for assistance just to cover—it says "annual Federal and tribal costs arising from ongoing quantification efforts and sufficient to cover the costs of implementing the future settlement." So you have got two fronts that you are looking at from a funding perspective, is that correct?

Mr. ECHOHAWK. Steve, you want to?

Mr. GREETHAM. Yes, that is true, as far as the two funding components, now working on and then implementing whatever we agree to.

I just want to make sure two things are clear. One, those long time lines. Folks have not been negotiating for 25 years. For example, in the Abeyta there have been negotiation efforts, but a lot of the efforts require extensive hydrologic and technical assessments to figure out how the watershed works. So you figure out what the available supply is. There is a lot of time-consuming technical work.

Since August 2003 we have been working with a mediator and we have been meeting on a very aggressive schedule. When you contrast the time between sitting down to talk in a negotiating context versus going to the courthouse to sue, the time to complete is much quicker through the negotiation process.

Also you mentioned, how can we be sure that there is going to be the impetus for folks to finish. The impetus exists. For example, on the Rio San José, on which you have the Pueblos of Akima and Laguna, the two pueblos back in the early 1980's took an action to Federal court to protect their water sources, their water supplies—they are down at the bottom of the system—as against junior diverters upstream. The Federal court kicked them out and said: I am sorry, you cannot protect anything until you have a court decree saying precisely what your water right is.

So until there is a formal court decree quantifying, the tribes, their ability to protect their property interests and their sovereign interests in their water resources are compromised.

The finality serves a tremendous value. John D'Antonio supervised or oversaw the formulation of the New Mexico State water plan back in 2002. In that document, which was the result of extensive public comment processes and intensive town hall-type discussions, folks really highlighted on the problem of not even being

able to plan as far as the use of water resources without having final quantifications of their rights.

So it is not just a question of if we pay more money then folks will get the interest to finish. Folks are interested in doing it now. Two gentlemen are here from Taos Pueblo, Nelson Cordova and Gil Suazo. For the past 14 years they have essentially dedicated their lives to seeing the quantification of the tribe's water rights to closure, and they do it often without any payment or compensation from their tribe.

But the commitment is there. The resources and the expertise need to be made available to complete the process.

Senator MURKOWSKI. I appreciate you clarifying the length of time that you have been involved in the negotiations.

Mr. BELL. Senator, just one aspect of your question. I think the fact that this mechanism would make it mandatory means that the tribe would no longer be faced with the prospect of losing money for some important other Indian program if their settlement is funded. That has been something they have faced and it is a real disincentive for tribes to participate. This would solve that.

The CHAIRMAN. Thank you very much.

I do not believe we are saying, and we surely are not advocating, that the Federal Government say, we are going to cut Indian programs for the amount of money we had to settle a claims case for. We may be cutting Indian programs for some other reason that we may not like, but I do not think that is the case.

I do think it is real that the Department is beginning to say, where do we get the money. I myself think it is a mistake for the Federal Government not to participate all the way up and down, because it seems to me if the end product is something that the Federal Government says is unreasonable, they should have been players all along talking about its unreasonableness, rather than wait until the end.

The two that we have spoken of, Navajo and the long-term Aamodt case, are rather interesting in that the biggest portion of the settlement in each case is the construction of large public works facilities. So that one ends up saying the water right must be worth, who knows, X, and then you look out there and say, let us build two water lines. Now, what do they cost? And they are not necessarily related, but the water lines may cost $800 million. So the answer is the solution, the settlement, is build the water lines, in exchange for which the water rights are settled.

You know, the Government could get involved in that much earlier and say, we do not think that is the way it should be settled. So I do not think they help the case to not get in it and argue—and I say that with you here; I have talked to the Secretary personally about it. Frankly, we have got to find money to settle the cases, and we will find it somewhere. They are looking for a stream of resources. That is how we settled the Arizona one. They found a stream of resources. It did come out of the budget, however, so there is no argument. It was sent over from another place that it was going, but it was coming out of the general fund in the final analysis.

So we have to do that. It is a hard job, but we will have to do it.

Let us see. Did you have one last comment, Mr. Attorney, Steven?

Mr. GREETHAM. Just in following up on Senator Bingaman's comment earlier about in essence a modified Peter principle at work, that once folks demonstrate proficiency they get promoted out of their job of working on Indian water rights. Unfortunately, I think that is a sad example of the lack of institutional priority being brought to bear on the resolution of these claims.

It is not just the money, although that is obviously the critical material component. But there needs to be a reinforcement of the institutional critical priority on seeing these efforts to closure.

The CHAIRMAN. Well, two ways to look at it. Senator Salazar's approach may be looked on as something that he is against promoting people. So that I do not know where we are going. Those people want to get promoted. They do not want to be where they were.

On the other hand, I would make one last observation. It has to do with payment of fees. The case was made we have got to pay for the Indian costs for the Indian litigation. I think you made the case. You ought to know, as a Senator we get a lot of complaints about the poor people that get sued too by the Indian claims, and they want us to pay their fees, too. They are poor, they do not have any money, and all of a sudden they get served with a subpoena and get in a lawsuit.

They come up here one time, they asked Senator Bingaman and I to pay fees up and down the river for the people that were in the lawsuit. We did that once. It is a tough situation, but I wanted to say it is not all always only the Indian way, the Indian problem. It is another problem too for the non-Indian who has to pay. They were innocent, too. Not in a legal sense, but they did not know what was going on for 50 years, 100 years.

With that, we will go on to the next panel. Thank you very much.

Okay, the last panel. We have six of you: the Awwa Research Foundation, General Electric, the Environmental Defense—I guess it is Environmental Defense Fund—Tom Graff; Groundwater Association; the city of Albuquerque; and the Texas Water Development Board.

Can we get started? Are you ready, Awwa Research, Richard Karlin?

STATEMENT OF RICHARD J. KARLIN, DEPUTY EXECUTIVE DIRECTOR, AWWA RESEARCH FOUNDATION

Mr. KARLIN. I am. My name is Richard Karlin. I am the deputy executive director of Awwa Research Foundation. I want to thank the Senators for inviting us to participate in this conference.

By means of introduction, I would like to describe what we are so that people put into perspective what we are talking about. Awwa Research Foundation, commonly known as AwwaRF, is nonprofit international, member-supported organization that supports research to enable water utilities, public health officials, and other professionals to provide reasonably safe and cost effective water for citizens.

We get our resources from 900 voluntary contributions from water utilities around the world, mostly in North America, Con-

gress, Federal and State agencies, and from other research organizations. We have a long history of partnering. We have partnered with 30 organizations from eight countries, including several governments, and have been able to parlay $52 million we have received from Congress into a $360 million program since 1986.

With that in mind, we do believe that there is a Federal role in conservation technology and knowledge management regarding water resources. We think that the Federal Government should consider public-private partnerships as a cost effective approach for developing long-term solutions to the challenges facing the drinking water community. Provision should be made in any future programs, in our belief, that would require or encourage public-private partnering as a portion of the program.

We believe nonprofit research organizations have several distinct advantages over purely Federal programs. No. 1, we can leverage Federal funding. As we indicated before, we have about a seven to one record on our leveraging. We believe that we have access to a lower overhead management process. We can access a national and international network of water researchers in a variety of ways. Last, we have active involvement by the actual end user to get real research needs and therefore real research results that can be used as opposed to studied.

In summary, public-private partnering we believe is a win-win opportunity for the Federal Government, water utilities, and the public because it not only leverages funding, but it provides for coordination that can help eliminate some of the duplication that sometimes happens in research.

Thank you very much.

[The prepared statement of Mr. Karlin follows:]

PREPARED STATEMENT OF RICHARD J. KARLIN, DEPUTY EXECUTIVE DIRECTOR, AWWA RESEARCH FOUNDATION

4. CONSERVATION AND TECHNOLOGICAL DEVELOPMENTS

INTRODUCTION

Established in 1966, the Awwa Research Foundation (AwwaRF) is a member-supported, international, nonprofit organization that sponsors research to enable water utilities, public health agencies, and other professionals to provide safe and affordable drinking water to consumers. Resources to fund research come from voluntary contributions from nearly 900 public water utilities, Congress, federal and international agencies, and other research organizations.

Since 1983, Congress has provided support to the AwwaRF, helping it become the centralized coordinator of studies that focus on the challenges faced by U.S. water suppliers. This congressional support has come in the form of earmarks in the VA-HUD Independent Agencies appropriations; 18 separate earmarks have provided $52 million in seed funding. Research lays the groundwork for cost-effective solutions to such issues as new technologies to control emerging water contaminants, aging infrastructure, finding new sources of water, conservation strategies, and keeping water supplies secure. 1Many of these same issues are described in the conference topic "Conservation and Technological Developments."

As the leading organization for drinking-water studies, AwwaRF has partnered with 30 organizations worldwide in it research activities. Partners include federal and state agencies, research organizations from eight countries, foreign environmental and health agencies, and international drinking water organizations. Through these partnerships, the Foundation is able to leverage resources, maximize research efforts, and develop and disseminate broad-based knowledge to the drinking water community. By leveraging the $52 million provided by Congress, AwwaRF has funded a total research effort of over $360 million on topics such as arsenic removal, disinfection byproducts, *Cryptosporidium* control, security, infrastructure re-

newal and replacement, perchlorate, and new technologies to address emerging contaminants in drinking water.

Research supported by AwwaRF and its partners has resulted in development and validation of new treatment technologies that are effective, reliable, and affordable for removing drinking water contaminants of concern.

Examples of the positive impact of AwwaRF research are:

- AwwaRF's pioneering research showed that ultraviolet treatment was effective against *Cryptosporidium* so that the EPA could recommend it as a treatment when developing regulations for surface and groundwater regulations.
- Since the 1990s, many water utilities are now installing membrane treatment processes as a result of the AwwaRF's research that demonstrated that membranes are cost-effective and reliable in meeting increasingly stringent regulations for both large and small water utilities.
- In anticipation of lowering of the arsenic action level and the emergence of perchlorate as a drinking water contaminant, AwwaRF leveraged federal funds to perform multiple pilot-and full-scale studies that will enable water utilities to confidently select appropriate treatment technologies.
- AwwaRF research has impacted other areas important to water utilities and consumers including energy conservation practices, water conservation practices, cost-effective desalination processes, aquifer storage and recovery of treated drinking water, and automated metering to promote conservation.

PROPOSAL

This proposal responds to the Senate Energy & National Resources Committee's request for comment as to the role of federal government in addressing the challenge of meeting the nation's ever-increasing demand for water.

AwwaRF is submitting a proposal on the topic "Conservation and Technology Developments." This topic addresses the development of new water technologies and operational strategies that can be used by the drinking water community to meet future water challenges, a primary focus of AwwaRF. The other topics focus on national policy issues.

The U.S. water supply community, particularly in the arid Southwestern states, is increasingly challenged by limited water supply. In many areas this challenge is being amplified by persistent drought and significant population growth. Water utilities are being compelled to manage resources more cooperatively on a regional level, pursue conservation measures and rate-based incentives, and leverage appropriate technology advancements to develop alternative water supplies (e.g., desalination and reuse). These measures place significant financial burden on water suppliers and, in turn, their customers, the U.S. public. The federal government can help to ease this burden through public education regarding the realities of limited water supply, the cost and value of water, the public's role in water resource management, and through continued sponsorship of research and development on key water supply issues and technologies.

With three decades of experience in successfully leveraging public and private resources to fund research that benefits the public, the AwwaRF supports the critical role of the federal government in helping to identify drinking water challenges facing the nation's public water systems, and providing resources to address these challenges. The AwwaRF believes that the most effective approach to solving these challenges is through cooperative efforts between federal agencies and the private sector. This approach helps ensure that the world-body of knowledge and national expertise are brought together to develop and implement reach strategies.

Therefore, AwwaRF proposes the Senate Energy & Natural Resources Committee consider public-private partnerships as a cost-effective approach for developing efficient long-term solutions to the many challenges facing the drinking water community. The following information provides the basis for this proposal.

PARTNERSHIP APPROACH

Provisions should be made in future legislation to encourage and/or require the participation of nonprofit organizations, such as the AwwaRF. Nonprofit research organizations offer distinct advantages over a purely federal program.

First and most importantly, nonprofit organizations can and will provide matching funding for research of interest to the water community. This leverage can be significant—documented six to one funding leverage for AwwaRF earmarks—and can be in many forms including a cash match, management fee contribution, and contractor contributions.

Secondly, funding from the federal government can take advantage of the extremely low overhead rate provided by most nonprofit organizations. For example,

the AwwaRF has a general administrative cost factor of 11 percent, which means that the great majority of funding is spent on research.

In general, nonprofit research programs have excellent research management systems and processes in place. The AwwaRF operates one of the most efficient and internationally competitive processes available in the global water community. This process ensures that research issues are examined from different perspectives and that the most competent researchers for a specific issue are utilized.

Industry-sponsored research programs, like AwwaRF, are closely connected to the user of the technology—water suppliers themselves—thus ensuring the rapid dissemination and implementation of research developments. AwwaRF research is peer-reviewed, and the results are used by researchers, federal agencies, and the drinking water community.

Moreover, AwwaRF members, primarily public water utilities, help determine appropriate research topics necessary to address their actual needs. The identification of "real-world" needs is the essential ingredient in producing research results that can be applied by water suppliers.

Lastly, existing research organizations have a large network of researchers, both national and international, who have worked extensively on water issues. This network allows immediate access to the best talent in the world without creating the need to create a new institution and/or import of expertise. Results can produce better and faster without the lag-time inherent in creating a separate organization. Additionally, the international research community has the opportunity to provide technical and funding leverage to issues of common concern. Since many of the issues transcend national boundaries, a nonprofit organization with extensive international reach provides a mechanism for cooperation on a global basis.

In summary, public and private partnering is a "win-win" for the federal government, water suppliers, and the public through leveraging of limited resources to develop the best knowledge to produce high quality, affordable, and consistently safe drinking water.

The CHAIRMAN. It sounds like you were speaking in the past tense as to the Federal Government's participation. Is that because they used to, or they still do?

Mr. KARLIN. They still do. I am sorry if that was not clear. We are still active in several partnerships with the Federal Government through U.S. EPA, through Department of Energy, and through the Bureau of Reclamation.

The CHAIRMAN. Thank you very much.

How do you say your last name, sir?

Mr. SABOL. "KOLL-in SAY-ble."

The CHAIRMAN. "SAY-ble."

STATEMENT OF COLIN SABOL, CHIEF MARKETING OFFICER, GENERAL ELECTRIC

Mr. SABOL. Thank you, Mr. Chairman and members of the committee, for inviting me here today. I appreciate it.

GE Water and Process Technologies is a leading global provider of water treatment systems and services. Water is the lifeblood of industry and our products and services conserve a billion gallons of water annually for our industrial customers. Our treatment systems create safe, affordable water for millions of people living in water-scarce regions around the world. We create and commercialize innovative technologies through the GE Global Research Center, where we have 2,500 technologists, and we spend $3 billion on research and development annually.

To ensure an adequate, safe supply of affordable water, a strategy that incorporates conservation and the development of new water resources is critical. Membrane-based treatment solutions are the key to creating these new water sources, such as brackish water aquifers, sea water, and even waste water. Membrane tech-

nology is proven effective, but remains a costly alternative to surface water treatment. Broader application of these technologies to create meaningful new water sources requires investment to reduce the energy consumption associated with the operation of these membrane systems.

GE and other companies have created great strides in reducing the cost of desalinating sea water using membranes, from over $20 per thousand gallons in 1980 to now less than $4 per thousand gallons today. We believe that a broad research and development program focused on membrane advancements and energy efficiency could lead to a 30 percent reduction in operating cost and a 25 percent reduction in capital cost of these systems. This would encourage industry and potable water providers to reduce their reliance on surface water sources by fulfilling their demand with new water sources.

Thank you.

[The prepared statement of Mr. Sabol follows:]

PREPARED STATEMENT OF COLIN SABOL, CHIEF MARKETING OFFICER, GENERAL ELECTRIC

DEVELOPMENT OF ENABLING TECHNOLOGIES FOR ENHANCING WATER AVAILABILITY IN THE UNITED STATES

National Need

Worldwide water needs have been increasing rapidly due to population and industrial growth. In the past, water was seen as mainly a Middle-East or African issue, however, with the rapid growth in North America this view point is changing. In contrast to many areas of the world, the United States has enjoyed abundant supply of freshwater at a relatively low cost to the end user. Over the next few decades, however, factors such as population growth, increased industrial usage, and pollution of existing supplies may place a strain on the nations capability to supply the necessary quantities of safe freshwater. A case in point is the recent and projected growth in southeastern and southwestern regions of the country where safe freshwater shortages occur routinely during drought years. These regions may also face daily shortages in the not so distant future. The potential inability to meet the growing needs for freshwater will adversely impact public health and various economic sectors of the United States. To ensure adequate supply of safe freshwater at a reasonable cost, a combination of water conservation, reuse and recycling, as well as development of new water resources is critical. Since conventional water resources are limited, the development of new water resources will most likely come from existing impaired resources such as brackish water and seawater, in addition to water generated during energy production (oil, natural gas or coal bed methane production). It is imperative the U.S. government recognize this growing need and act quickly to fund research and development of enabling technologies in areas such as industrial water reuse, generation of potable water from non-potable sources using desalination powered by renewable energy, and low-cost seawater desalination. In all of these areas it is clear that various membrane technologies can play a significant role in helping the U.S. to protect and increase one of its most valuable resources.

Desalination holds the potential for addressing the shortage of safe freshwater in the United States by processing vast inland brackish water supplies and coastal seawater. While desalination has the potential to address existing and future water needs, it has been plagued by high cost, making it non-competitive with natural resources used today. Of the available desalination techniques, reverse osmosis (RO), multi-stage flash, multi-effect distillation, and vapor compression, RO consistently has the highest demonstrated energy efficiency, typically 3-8 kWh/m3. Even at this higher efficiency, energy cost still accounts for roughly 45% of the cost of water in RO based systems. For many projected water starved regions of the country and remote, inland areas where grid connectivity is limited, the retail cost of energy ranges from $0.08-$0.12/kWh. While the cost of energy generation has dropped, for remote areas, the cost associated with transmission and distribution makes up a large percentage of the retail energy cost. Hence, alternative solutions are required for the production of safe freshwater.

Two prevailing concepts for reducing energy cost associated with RO are to 1) reduce overall operating costs ($ per 1000 gallons of water produced) of desalination systems and 2) couple RO with renewable energy sources, such as wind and photovoltaics. Research and development focused on high recovery, low energy desalination systems would include efforts on high efficiency energy recovery devices and pumps, vertically nested signature system designs, enhanced pretreatments (antiscalants and filters), and finally low energy, high rejection membranes. The table below shows the dramatic improvement made in the industry to increase the permeability of RO membranes, which results in a decrease in the required power consumption of desalination systems. Membrane permeability, denoted by A-value, correlates directly to the operating pressure required for desalination. Cellulose acetate membranes require around 28 bar of driving pressure to achieve common flux targets, the most common polyamide membranes operate at only 15bar. In the past ten years there has been significant development of RO membrane technology that has lead to the commercialization of membranes with about twice the permeability. GE has presently working to develop RO membranes with even greater permeability, with a target driving pressure around 4bar. Combining the improvements in RO membranes with energy recovery devices and pretreatments could lead to an overall reduction in operating cost per 1000 gallons of at 30%, and a reduction of capital and land cost of 25%.

Membrane	Permeability (A-value)*	Driving Pressure (bars)
Cellulose Acetate	35	28
1993 state-of-the-art polyamide RO	10	22
1997 state-of-the-art polyamide RO	17	15
2002 state-of-the-art polyamide RO	22	11
New GE polyamide RO	30-50	2.8-4.8

*A-value has units of 10_{-5} cm/(sec*atm)
Table: Industry improvement in RO membrane permeability

Desalination via a hybrid approach, where renewable energy sources (RES) such as wind energy or photovoltaic are coupled with RO desalination, is another attractive alternative to conventional RO systems. It is apparent from investigating the cost structure of a traditional desalination system that energy, capital, and operation and maintenance cost are major factors. The advantages of a combined RES-RO system would address these factors. Coupling the energy generation directly to RO systems through the use of renewable energy sources the energy cost associated with transmission and distribution is avoided. In addition the RES resources throughout the nation correlates to potential impaired water resources that can be used for the development of new, safe freshwater, as shown below. Specifically, the plain states have abundant saline aquifers, which if cultivated, can yield freshwater for the agricultural economy. In the plains states, both wind and photovoltaic sources are prevalent and can be used for desalination. In the southwest, specifically New Mexico, Texas, and Colorado, significant growth in population is projected. These areas not only face the challenge of meeting the ever-increasing water demand, but also the restrictions of water rights on the use of available freshwater sources. The development of novel membrane materials and modules, energy recovery devices, and operating strategies in a flexible, modular RO configuration coupled with renewable energy sources offers an excellent opportunity to provide cost-effective freshwater.

Potential Program Scope

GE Global Research in conjunction with its Infrastructure and Wind Energy business units will collaborate in the development of flexible, modular RO configurations. The key objectives of the program are:

- Design and fabricate advanced membrane materials
- Establish optimal efficiency through fluid dynamic modeling of module designs
- Develop system level energy integration to design flexible, modular RO configurations

This program allows for the complete system development of cost-effective desalination strategies that can be commercialized to meet the growing freshwater needs in the U.S. GE Infrastructure has state of the art membrane research and fabrication capabilities in its Osmonics facility located in Minnetonka, MN. Osmonics employs approximately 700 people in areas including membrane research and development, design of modules and filters, and complete membrane systems fabrication.

They have recently completed the construction of a 50,000 sq. ft. building to house a new $7 million state of the art membrane coater for desalination.

The CHAIRMAN. Thank you very much.

Tom Graff.

STATEMENT OF THOMAS J. GRAFF, CALIFORNIA REGIONAL DIRECTOR, ENVIRONMENTAL DEFENSE

Mr. GRAFF. Thank you, Mr. Chairman. I am Tom Graff, California regional director of Environmental Defense. The proposal that we submitted to the committee was jointly drafted, really principally drafted, by my Texas-based colleague, Mary Kelly.

One can look at Western water policy in the United States as a glass being in effect half empty or half full. There are real problems. That is the half empty part. There is very substantial population growth. The most substantial population growth overall in the United States is occurring in the driest States of our country, and absent focused conservation efforts that will mean added stresses on our water supplies.

We already have very significant environmental stresses and inequities. Declines of salmon and other iconic species, endangered species losses, starved rivers and parks have been impacted by dams and reservoirs and water operations, and climate change appears to be a looming challenge that we are going to have to face as well.

We of course have uneven water supplies. Droughts are a fact of life in the West. Just in the last dozen years, California, the Mountain States, New Mexico, and now the Northwest have faced significant droughts. I would say we have only slowly reforming institutions and laws to cope with all these very real problems.

But we also have—there is also an optimistic view, a glass half full point of view. Our institutions and public processes have been adapting. To take a California perspective, I go back to the omnibus bill that Senators Bradley and Garn were so intimately involved with in 1992 that led to the Central Valley Project Improvement Act of 1992 that was such an innovation in California, that led in turn to the CALFED program that Senator Feinstein had a big hand in prompting and nurturing along.

The Colorado River States have gotten together on surplus criteria. We will see if they can do the same on shortage criteria. That of course was prompted and passed in part by the California 4.4 plan, which I actually did not think could happen, and then a quantification settlement agreement among southern California entities, both urban and agricultural, which has been another innovation.

Of course, none of these innovations are perfect. They are all works in progress, but they have prompted positive change.

The other and last major point I would like to make is bringing economics to bear on water policy is a healthy thing. Having beneficiaries pay the costs of the water that is stored and delivered to them is useful to prompt innovation. It is useful to prompt technological innovation, which is of course another topic of this panel. Urban water pricing reform can do the same. It will prompt conservation. It will prompt innovation.

Last, voluntary transfers, which have also been discussed at some length already today, are another way for a limited water supply to be widely shared and usefully deployed.

I would just, last, end by saying that one should account in these voluntary transfers for social and community and worker and environmental impacts. I think there was a question earlier about where is that happening in a way that is constructive and innovative. I would have people look at the local entity that has been created by the San Diego-IID transfer in southern California. There is a group of us that got together, a group of United Farm Workers, California Rural Legal Assistance Foundation, Latino Issues Forum, Environmental Defense, and others, who have been advocating for community and worker impact assessment and relief in connection with those transfers.

Remarkably, the farm workers and the farm bureau down there are actually working together now in the context of this local entity. So I think voluntary transfers can be made to work, but one needs to take account of all the different impacts.

Thank you.

The CHAIRMAN. Thank you very much.

Let us see. David Wunsch, National Groundwater Association.

STATEMENT OF DAVID WUNSCH, STATE GEOLOGIST OF NEW HAMPSHIRE, ON BEHALF OF THE NATIONAL GROUNDWATER ASSOCIATION

Mr. WUNSCH. Thank you, Mr. Chairman, members of the committee. My name is David Wunsch. I am the State geologist of New Hampshire, but I am representing the National Groundwater Association this afternoon. Our association has over 16,000 members and our association is predicated on the safe use and wise development of our groundwater resources.

We are a unique association that is comprised of three different divisions, one being contractors, one manufacturers, and the scientific and engineering division which I represent. So diversity is truly one of our strengths.

Recently we polled our membership as well as other State regulatory agencies that deal with water and State geological surveys about the knowledge of groundwater and the state of the science throughout the country, and our answers of course conform to some of the questions you asked for this committee.

Some of our results are both consistent and alarming. For example, only 2 of 28 States reported that they have sufficient knowledge of the potential yields of their aquifers. In a follow-up survey, 41 of 43 States indicated they expected localized groundwater shortages within the next 20 years.

There was also reported a wide disparity in the quality of groundwater monitoring programs and networks from State to State. These issues are not isolated to the arid Southwest. My native State of New Hampshire is also suffering water shortages, even with our humid climate, along the seacoast region of the State.

Our membership consistently stated that the most useful and efficient action for the Federal Government—that the Federal Government could take, would be to increase funding for cooperative

groundwater programs and data collection. A good example of a successful Federal-State partnership is the National Cooperative Geologic Mapping Program, which I know members of the committee are acquainted with. In this program the States leverage Federal funds and direct research to areas of their States in most need and share the data with the Federal Government, which creates national data bases.

This same model could be utilized for programs such as aquifer mapping, which it was reported by our group needs more work, as well as enhancing State groundwater monitoring networks and trying to create parity among the States. One strength of this program is that it is statutorily established to define the work, it produces timely deliverables, and it keeps overhead costs under control.

Another Federal initiative that has been echoed by others today is that there is a need for a national clearinghouse of both groundwater information and data, including real-time data, such as groundwater levels, that could aid in drought management, which hits different parts of the country at different times.

Other research priorities cited by our membership include research on water use and conservation, aquifer storage and recovery and artificial recharge, alternative treatment systems, including using brackish water supplies, development of models and standards that bring data together, and translating this information in a usable form for policymakers.

Studies on emerging contaminants and technologies to address these pollutants are also needed by the regulatory community. Of course, education for the public nationwide so they will understand the urgent need for responsible water use.

I do not have written comments to submit for the record, but I will offer that National Groundwater has position papers and the results of our survey available for the committee.

Thank you.

[The prepared statement of Mr. Wunsch follows:]

PREPARED STATEMENT OF DAVID WUNSCH, STATE GEOLOGIST OF NEW HAMPSHIRE, ON BEHALF OF THE NATIONAL GROUNDWATER ASSOCIATION

QUESTION 5: KNOWLEDGE OF WATER RESOURCES

Given the fundamental role that water plays in dictating the quality of life and economic opportunities in our communities, do we have the level of scientific understanding needed to assess accurately the sustainability of the surface and groundwater resources upon which we depend? Do we have an adequate scientific understanding to address potential water use conflicts? What initiatives should be undertaken to improve our scientific understanding in these areas?

While states are gathering the necessary data to inform decision-making, no state has met its data collection goals. In fact, only two of 28 states responding to an NGWA survey are very confident they know the potential yield from all of the state's major aquifers. We lack the fundamental data necessary to adequately understand the nation's ground water resources and make informed decisions regarding its use and management (NGWA 2003a; 2003b).

The federal government is currently playing and must continue to play a vital role as well. Although actual ground water management decision making is most effective when taking into account site-specific considerations, federal funding of cooperative water quality and quantity data collection and aquifer mapping leverages the expertise and resources of the federal government with partners around the country.

NGWA members identified increased federal funding for cooperative ground water quantity and quality data collection and aquifer mapping as the most useful actions the federal government could take. Additionally, NGWA identified increased re-

search related to ground water availability and the development of a national clearinghouse for ground water quality and quantity information as a top priority requiring federal government leadership. The most important types of water data to expand identified by NGWA members include: accurate water use, water quality for all aquifers, ground water level monitoring networks, on-line aquifer data and ground water recharge rates. Within each area, examples of possible specific activities are provided for consideration and further discussion.

DATA GAPS

- Establish a collaborative framework among federal, state, local and non-governmental entities to address data gaps on ground water resources. Collecting ground water data is costly, given its location and variability. While specific data gaps and priorities may vary around the country, collaboration will help maximize everyone's data-gathering efforts.
- Increase federal funding for cooperative ground water quantity data collection. Ground water professionals identified the need for additional federal funding for cooperative ground water quantity data collection as the most useful federal action. The data would be used to fill information gaps and will assist states in developing and implementing overall ground water management goals. The federal government should develop a cooperative program with the states and other interested parties so goals meet not only the national but also state and local needs as well. First steps include assessing available data and identifying the appropriate role of federal agencies. A potential model to follow is the National Cooperative Geologic Mapping Program, which includes a federal, state and educational component.
- Provide federal support for aquifer mapping. Funding for geologic mapping is provided to state geological surveys through the USGS STATEMAP program, the state component of the National Cooperative Geologic Mapping Program. The STATEMAP program utilizes state staff knowledgeable in the local geology that maintains the data upon which much of the mapping is based. The states, not the federal government, also select the areas of the state that are in most need of mapping data. The program provides a comprehensive understanding of the geology at/near land surface, in which ground water is commonly a major consideration. Limitations of the program are that it requires 1:1 matching of state funds; the mapping is required to be completed within one year; derivative maps such as fracture trends are not considered for funding; and maps do not necessarily focus on delineating subsurface aquifers.
- Another federal-state cooperative program involves the USGS and the state surveys from Illinois, Indiana, Michigan and Ohio. This partnership, known as the Central Great Lakes Geologic Mapping Coalition, is conducting three-dimensional geologic mapping mainly at 1:24,000—scale, specifically targeting the delineation of glacial aquifers. Limited funding has allowed only pilot study areas to be mapped during the last three years. However, the states and USGS have contributed considerable federal and state funds toward the effort. If additional funds are not forthcoming, it will take about 170 years to complete this mapping in high-priority areas of the four states. Although under funded, the Coalition serves as an excellent example of how a federal-state partnership can address the specific needs of a region that is united by common ground water issues
- Establish a national clearinghouse to identify sources of ground water data and links to those sources. These data should be disseminated widely to the public—or at least to authorized public and private water professionals—using several formats. These formats should include maps and reports showing interpreted data as well as Internet-based access to archived data and real time data collection. These data should be available from links on already existing National Spatial Data Infrastructure (NSDI) sites to make the information easier to find and assure that the proper documentation of these data is maintained.

RESEARCH PRIORITY AREAS

The following research areas have been identified by our ground water professionals as top priorities in the area of developing long-term ground water sustainability plans:

- Research on water reuse and conservation
- Research on alternative treatment systems
- Research on development of brackish ground water supplies

- Development of models and data standards that can bring together scientific data and inform local policy decision makers.
- Research on aquifer storage and recovery or artificial recharge.
- Research on emerging contaminants and the development of remediation technologies that can be used to address new and current pollutants.

EDUCATION AND COLLABORATION AMONG FEDERAL, STATE, AND LOCAL DECISION MAKERS

It is important for collaborative efforts among federal, state, local, and non-governmental entities and water professionals to educate decision makers, professionals, and the general public on topics including:

- What ground water data are being collected and what data are needed.
- How to utilize ground water data to make sound decisions.
- What current research projects and technologies are being developed, and how to incorporate these developments into ground water management decision making.
- What long-term effects does water supply infrastructure design have on the sustainability of the natural ground water system, and how do we design systems that take those impacts into consideration.
- What constitutes effective ground water conservation measures and how to incorporate these initiatives on a state and local level.

The CHAIRMAN. Thank you very much.

The city of Albuquerque. We are glad to have you, Jean Witherspoon.

STATEMENT OF JEAN WITHERSPOON, ON BEHALF OF THE NEW MEXICO WATER CONSERVATION ALLIANCE

Ms. WITHERSPOON. Thank you, Mr. Chairman and Senators. Thank you for this opportunity to speak. I am speaking on behalf of the New Mexico Water Conservation Alliance, although I am a city of Albuquerque employee.

I am here to urge that conservation continue to be seen as a significant component of the strategy, the long-term water resource strategies in this country. Conservation is critical to the future of our being able to meet demand with a diminishing supply. Conservation has proven to be successful in many cities in the West, with reduction rates in per capita usage of 30 percent or more. This provides additional water to meet growth demands, to meet environmental demands, to meet endangered species demands, and that is water that you could not have bought anywhere else. So it is an amazing source of additional water supply.

Another beauty of conservation is that it can be most effective in addressing new development, which many perceive as a lot of the problem. So conservation is getting directly at that source of additional demand.

The Federal Government has been key to conservation being successful in this country, initially with the bold step to adopt the new plumbing fixture standards in 1992. There are a number of additional ways that the Federal Government supports conservation, including the Bureau of Reclamation Water Conservation Field Services Program, which gives grants to both small and large projects that are related to conservation. FEMA is involved in water conservation. Many of the Federal facilities go through performance contracting that includes water.

The Energy Star program, which the Federal Government supports, has been incredibly helpful in getting energy efficient and water efficient appliances on the market and in people's homes.

I would urge you in closing to continue this involvement, to make water conservation—to integrate it into even more programs where conservation is a requirement of water and waste water project funding, to include it in FNMA provisions for mortgages, and the many ways in which water efficiency can be integrated into existing programs and legislation.

Thank you again for the opportunity.

[The prepared statement of Ms. Witherspoon follows:]

PREPARED STATEMENT OF JEAN WITHERSPOON, ON BEHALF OF THE NEW MEXICO WATER CONSERVATION ALLIANCE

CONSERVATION AND TECHNOLOGICAL DEVELOPMENTS—EXECUTIVE SUMMARY

Water conservation is critical to the future of this country. As population grows over time, demand increases, and supplies remain essentially the same, conservation must play a significant role in helping water providers meet demand. Water conservation is the easiest, quickest, and least expensive way to extend supplies dramatically.

Urban areas have led the way in demonstrating that conservation can achieve dramatic results. In the West, major urban areas like Seattle, Washington, El Paso, Texas, Denver, Colorado, and Albuquerque, New Mexico have achieved reduction rates of 30% or more—extending adequate supply many decades into the future. These programs and others have proven that conservation can be successful, can significantly reduce usage, and will benefit both suppliers and users with little or no change in their quality of life.

Technological advances in plumbing fixtures, appliances, irrigation equipment, and landscaping techniques have led the way in this effort. Replacing older equipment and appliances can immediately reduce user's water use dramatically. Focusing on management of water use, which requires education and understanding, is equally important. A xeriscape can use as much or more water than turf if it is not managed properly. Low flow plumbing appliances, if installed properly, can save one-third of a customer's usage almost "overnight." But these fixtures and appliances must be properly maintained to continue to operate effectively.

Many improvements in water delivery and use have not received the attention needed. Water systems typically have water losses or non-revenue producing water of 7% to 40% of production. Smaller systems, in particular, may not have the resources to install even basic tools like meters in order to determine how much water is being lost between the source and the customer. Water pressure, though specified in the nationally-adopted Uniform Plumbing Code, is often ignored. Meters, which are essential to understanding usage, are often not replaced when malfunctioning or broken.

The federal government, through the Bureau of Reclamation, the Environmental Protection Agency, and other agencies, has supported conservation through grants and promotion of advanced technology. These programs have suffered more recently, however, as some emphasis has shifted back to large supply and "hard" solutions. Competition for limited funds will become even more intense as the nation is forced to address its aging water and sewer infrastructure and the need for replacement. Federal support of water conservation, including "soft" components like education, must continue in order to maintain the success that has been achieved to-date and to more fully realize the benefits yet to be achieved through conservation.

CONSERVATION AND TECHNOLOGICAL DEVELOPMENTS

Introduction

The nature of water conservation in the United States has changed dramatically over the last decade. In the 1970's and '80's, conservation was used largely as a tool to carry utilities over periods of drought or infrastructure inadequacies. Conservation was utilized as a short term solution to a short term problem. In the last decade, it has become increasingly clear that conservation must be a component of many, if not most, long term water resource strategies for communities and states. In the West and in some areas east of the Mississippi, supply cannot meet the existing and/or growing demand if usage levels remain at the high per capita rates common in the '70's and '80's. Without reduction of usage and further development of new technology that increases supply at reasonable cost, many areas of this country cannot meet future demand. And as most areas become more conscious of this situa-

tion, the willingness to share and/or allow limited commitment of currently unused supply decreases.

This presentation will focus on urban or community water use and conservation. While urban or domestic use is a small percentage of overall use in most western states, urban areas have led the way in demonstrating that conservation can achieve dramatic results. Many major urban areas, including Seattle, El Paso, Denver, and Albuquerque have achieved 30% or better reductions in per capita use. This has occurred concurrent with natural drought that has dramatically decreased precipitation for many of the last ten years. Areas historically dependent on ground water are now preparing to use surface water while, overall, use of ground water has increased as precipitation becomes less dependable. And, as flows in rivers decrease, demands for water for environmental purposes, e.g., endangered species and riparian habitat, increase.

Lower precipitation levels are expected to become the norm in portions of the Southwest. Rivers such as the Colorado and Rio Grande, which were appropriated in the early, historically very wet twentieth century may very well not supply as much water as has already been appropriated, further increasing supply shortfalls. Population growth, while it has slowed in many portions of the Sun Belt, is still occurring at 3% to 10%, a trend which is not likely to change, particularly given the expected higher growth rates of Hispanic Americans (through both natural increase and immigration). Water conservation is vital to the future economic and environmental health of the country.

Technology and the Federal Role

Technological advances affect water conservation in many ways. At the household level, the development of well-functioning, low water use toilets, showerheads, and other plumbing fixtures has provided the easiest, quickest, and least expensive "fix" to reduce water usage. For less than $200, any household can reduce its indoor per capita water use by one-third by simply replacing higher use fixtures. With minimal maintenance, these inexpensive fixtures will continue to keep usage down indefinitely. However, people must be educated to watch for and repair leaks, replace flappers with correct models, and manage their water use habits to reduce even further. Plumbing models which will further reduce the waste taken for granted with every flush are under development. Research is not adequate, however, to understand the limits of conventional sewage collection systems, i.e., whether sewer flows become inadequate if toilet flush volumes go too low.

The federal government, through adoption of plumbing fixture standards in 1992, led the country into the needed, new conservation-oriented mentality. Passing these laws at the federal level avoided much of the confusion and backlash that would have occurred if each state had to adopt its own laws. This same leadership is needed relative to new products which circumvent the intent of these laws, such as gang showers (multiple low flow shower heads used simultaneously in one stall) and continuous bleed-off evaporative coolers. Egregious water waste should not be acceptable just because a homeowner can afford expensive fixtures and high water bills.

The federally-supported Energy Star program has been very successful in promoting the development, sale, and use of high water efficiency appliances. While the primary focus has been on energy, most low energy use appliances also use less water. At some point in the future, manufacture of high water use appliances should be prohibited, just as federal law now prohibits manufacture of high water use plumbing fixtures. Effort is now underway to develop a program for water use labeling requirements. This effort will help educate and inform the public in making wise water use purchasing decisions, in ways not possible now. Federally-supported financing programs, such as Fannie Mae mortgages, could also be utilized to increase the market penetration of high efficiency appliances and hot water on demand systems in new construction.

In the dry West, landscaping can consume 30% to 50% of total urban use. This usage creates the high seasonal peak which drives and then underutilizes water system capacity. And, unlike indoor usage which can be treated and reused, this outdoor water use generally evaporates. Led by the landscaping community in Denver, xeriscaping (low water use landscaping) techniques and plants have been developed and individualized for the climate conditions in different parts of the West. The endless possibilities of this low use alternative to turf are being explored and promoted. And irrigation technology has changed dramatically as newer landscapes require less water and customers demand higher efficiency systems. Sprinkler system efficiency, particularly for large turf areas that are professionally managed and maintained, has gone from 50% to 70%+. Drip irrigation hardware continues to become both more sophisticated and easier for do-it-yourselfers to understand.

Additional research, promotion, and education is necessary before the potential reductions in landscaping use are approached even in the urban setting, however. The Bureau of Reclamation's Conservation Field Services Program, among other federal programs, has helped to fund local research and education projects. More recently, in some regions, these funds have been substantially reduced and restricted to exclude education efforts. At the customer level, research and development can provide products and information, but proper management and maintenance of the products depends on education and public information. Excluding this important component is diluting the effectiveness of more efficient products and plants. Uneducated homeowners are also more likely to overuse pesticides and herbicides, often leading to additional water use as well as contamination of storm and ground water.

For the remaining non-residential urban water uses, research and development into lower use equipment, education to ensure efficient water management and maintenance, and financial assistance for major improvements is even more important. Commercial, industrial, and institutional users often ignore water costs and efficiencies while focusing on high cost, energy usage. Longer-term paybacks are often less acceptable, even if the changes will benefit the company, and saving water is often not within the accepted corporate mandate. Hospitals, for instance, often run high use wash equipment twenty-four hours a day even if that flow is not needed much of the day. Water bills are often paid by financial people who have no direct connection to either management or operational staff. And management may not communicate a commitment to efficient water use to staff, diffusing the ability of the organization to minimize usage.

The federal government, through FEMA, educates facility managers about water conservation, as well as working more directly on some federal facilities to reduce usage. Performance contracting for federal facilities to reduce usage of energy is common, but is often not feasible for water because water costs are so low. And funds to implement water conservation improvements are often not available for federal facilities, similar to non-federal facilities. Since 9/11, security issues and the financial demands to meet these concerns have reduced the federal resources focused on water conservation in many areas. While the need to counteract terrorism is unquestionable, the need to ensure that federal facilities and the communities in which they are located will be able to meet future water demand is also critical. Excessive turf landscaping, leaking and inadequate infrastructure, and no metering of individual water uses are examples of inefficient use of water under federal control which need attention in many areas. In Albuquerque, development of innovative approaches to individual building water reuse was severely reduced or lost as a result of the focus on security issues.

At the water provider or system level, many potential methods to reduce conservation have been inadequately addressed. Unaccounted-for-water (UAW) or non-revenue water ranges from 7% to 50%, tending to the higher end for small utilities, which typically have volunteer boards, minimal staff, and very low water rates. While these losses cannot be eliminated, UAW rates of 7% to 12% are entirely feasible. The new standards for calculating these losses, while maybe improving understanding in the long term, have confused the issue and made data from different systems incomparable. Federal assistance in funding efforts to audit UAW, reduce loss from leaks, replace malfunctioning meters, and meter unmetered uses would help address this area.

Federal water and wastewater funding should be available for these improvements, as well as rehab and replacement of older or worn lines. The need for rehab and replacement will become greater as the majority of the nation's water and sewer systems reach forty plus years; but other system needs, including UAW, cannot be ignored. Even self-supporting UAW efforts, like testing, maintenance, and replacement of large meters, are often cut first when budgets get tight. And more low volume uses, like drip irrigation and continuous bleed-off evaporative coolers, may not be registered by meters, increasing the non-revenue water. Pressure issues have been addressed by a few utilities, but too many systems are not meeting the national Uniform Plumbing Code requirement for 80 psi. Pressure reduction valves are often not installed where needed, even though much of the conservation-related equipment, particularly drip irrigation, needs to operate on lower pressure.

The Environmental Protection Agency assists utilities through Clean Water Act and Safe Drinking Water Act funds. Provision of these funds should be linked to development, adoption, and effective implementation of a water conservation plan, including measures aimed at customers, and education. The amount charged for water, i.e., rates, is a crucial component of these plans since low and/or decreasing block rates falsify the value of water, provide inadequate resources for utility improvements and conservation incentives, and may lead to utility failure.

The EPA itself could also launch a more aggressive education campaign related to conservation, both by promoting conservation issues and solutions itself and through making materials available to communities and utilities. This federal role was more evident in the '80's when the need for "permanent" conservation was just beginning to be recognized. EPA grants should also be available for state conservation efforts, where issues and target population are much more diverse, the logical link between revenue and program doesn't exist, and the conservation effort may not be "owned" and/or financed by one agency.

"Larger" ways to extend supply such as reuse and desalination are necessary, also. While reuse is not a solution in some cases, since it may reduce river flows, reusing gray or treated water for irrigation and other purposes help preserve potable water for drinking water purposes. In an urban setting, large scale reuse is most practical and safe while, in a rural setting, individual reuse is most practical. The Bureau of Reclamation has helped fund and will hopefully continue to help fund many large scale reuse efforts. The Bureau is also helping to fund some desalination projects. In inland areas, these may involve recovery of brine water which was formerly considered nonpotable. In the coastal areas, if costs can be brought down over time, desalination may provide a source for drinking water supply that would allow inland states to use more of the country's surface water supply. Additional research and expanding technology to bring the costs of treating ocean water down are needed.

Conclusion

Water conservation can have a dramatic impact. In Seattle, Washington, which most people are surprised to find even needs conservation, water use has been cut dramatically over the last twenty-five years. Over that period, the motivation for conserving has varied from avoiding the cost of new facilities to ensuring that water remains in the rivers for salmon, and the reductions have been significant. The city expects that, by finding additional ways to reduce usage, they will be able to keep production level for another ten to twenty years. To-date, Seattle has saved over 267 billion gallons of water or about 820,500 acre feet.

El Paso, Texas has reduced usage from 230 in 1978 to 140 gallons per capita per day in 2004. Water utility officials estimate they've saved $300 million in infrastructure costs through this reduction in usage.

Albuquerque, New Mexico's sole source of water supply to-date has been ground water. Usage has been reduced from 250 to 177 gallons per capita per day. The program, which was adopted only ten years ago, has already saved over 54 billion gallons of water (167,250 acre feet) the equivalent of a year and a half's production. Despite a population growth rate around 3%, production is at mid-'80's levels; per capita usage is at an amazing late-'50's level (see Chart*). Albuquerque recently adopted a 40% goal which should continue to reduce production through 2010. Albuquerque also intends to begin using surface water by 2007, providing a "window" of significantly reduced ground water pumping to allow the aquifer water levels to partially recharge.

Denver, Colorado initiated a conservation program around twenty years ago. The effort, which focused primarily on voluntary and education measures, was forced to change dramatically in 2001 due to the extreme drought. With the addition of mandatory measures, higher cost measures like rebates, and drought rates, usage dropped dramatically (see Chart).

Each of these cities and their conservation efforts is unique. Annual rainfall ranges from 9 inches in Albuquerque to 37 inches in Seattle. Initial usage rates ranged from 253 gallons per capita per day in Denver to 154 in Seattle. One city uses exclusively ground water to-date while three use a varying mix of ground and surface supply sources. What unites these cities is a community-supported commitment to reduce usage significantly through conservation programs supported almost entirely through utility revenues. Logically, as water becomes more limited, rates rise, though three of these cities' commodity rates do not exceed $3.50 per 1,000 gallons, a bargain compared to other potable liquids and compared to most other urban areas. While further reductions and price increases may be required, these cities have been able to greatly extend the water supply currently available to them for decades. (*Please note—results from 2004 may be unusually low due to the wet fall and winter.)*

The federal government has played a part in the success of each of these conservation programs, through adoption of the federal plumbing standards, Energy Star promotions, Bureau of Reclamation grants, federal facility use reductions, and other programs. Support for communities and utilities that do not have the level of

*The chart has been retained in committee files.

resources available to these cities of half of million or more population is needed even more. Conservation is, in fact, the easiest, quickest, and least expensive way to extend water supply. Reduction of per capita usage must be a component of this country's water resource strategy. Federal assistance, whether through funding or other methods, is essential to helping make this happen.

The CHAIRMAN. Thank you very much.

Texas Water Development Board, William Mullican.

STATEMENT OF WILLIAM F. MULLICAN, III, TEXAS WATER DEVELOPMENT BOARD

Mr. MULLICAN. Thank you, Mr. Chairman, members of the committee. On behalf of the State of Texas, we want to thank you for your energy and interest in this very critical issue to the State of Texas. On behalf of the State, we will commit to working with you and your committee as you work for solutions to this very, very important issue.

Sir Arthur Doyle, wearing his Sherlock Holmes hat, once said: "It is a capital mistake to theorize before one has data." While I suspect that Sir Doyle was reflecting on trying to solve a crime mystery when he developed that concept, I think that there is a direct corollary between this and our issues with water. That is, for us to try to resolve our water issues without having a good foundation of good data and then the good tools to analyze that data, it would be a capital mistake for all of us.

In the State of Texas, in 1997 we were suffering through severe drought and as a result of that the State put in place a bottom-up, public participation-based, regional water planning process that now is being utilized pretty much coast to coast as people work to address their water supply needs. When we first put that regional water planning process in place, the first thing that all of the public participants, the local entities, regional entities, that were participating in this process recognized was that we did not have good enough data on which to be making those policy decisions that were going to be impacting the State of Texas for the next 50 years.

As a result of that, we have worked on aggressively developing both groundwater availability models and surface water availability models for all the major and minor aquifers and the river basins in the State of Texas. However, there continues to remain a need, a critical need, for additional data and tools to help us understand our water resources.

Three recommendations I bring to you today that relate to data, water data, and issues that we would like you to take into consideration. First and foremost, at this time we have got to stop the erosion of Federal funding for the stream gauging program in the Nation. This is both going to create short-term problems and long-term problems. Without this information there is a variety of areas, both flooding and drought, development of projects, water supply projects, the whole water gamut is negatively impacted if we are not out there collecting good long-term record, scientifically based water data.

The second recommendation—and Mr. Chairman, I think this would go to one of your questions. That is, a recommendation related to not only the identification and the assignment of a clearinghouse for water resources research, but also an entity that

would be charged with roadmapping or developing the course of action for how that research should be conducted. Nothing is more frustrating, as one who is responsible for conducting a significant amount of water research in the State of Texas, as the realization of exactly how much duplication of effort is ongoing with respect to water research.

So if we could put in place a process where not only is all the research that is developed readily available to the water community, but also to assign at least one entity to be charged with the recognition of all the Federal agencies that are being involved in water-related research and State agencies and other organizations, so that that process could be laid out and be done in the most efficient and effective manner. I think that would be a good thing.

I think this relates also to, for example, the USGS has some wonderful groundwater scientists and surface water engineers that they can bring their strengths to. But also, the Department of Energy has some wonderful scientists that have been involved and will continue to be involved. If we could through a clearinghouse process—perhaps we could put in place where we would be able to take advantage of all those wonderful assets as we work together to try to ensure the future water supply needs of the Nation.

Finally, in my written remarks that were submitted there are a number of specific topics of research that we would like to focus on, including we just do not have the science or the tools, for example, to understand surfacewater-groundwater interaction at a level that is demanded today by the policymakers, at least in the State of Texas and in other areas, like for example the quantification of recharge.

Those are areas that there just needs to be a tremendous amount of additional effort put into.

Thank you, sir.

[The prepared statement of Mr. Mullican follows:]

PREPARED STATEMENT OF WILLIAM F. MULLICAN, III, TEXAS WATER DEVELOPMENT BOARD

QUESTION 5. KNOWLEDGE OF WATER RESOURCES

"It is a capital mistake to theorize before one has data."

Sir Arthur Conan Doyle

Our knowledge of water resources is the foundation upon which we build our solutions to water needs. If this foundation is faulty and inadequate, our solutions are doomed to collapse, costing taxpayers billions of dollars and, in times of drought, adversely affecting millions of lives. Unfortunately, our knowledge of our water resources, our foundation, is not as strong as it needs to be, especially as our water demands grow relative to a fixed resource. Federal support for collecting and interpreting basic water resource information has been cut and continues to shrink. This is unfortunate because the data we need to make important policy and financial decisions concerning our water resources is shrinking at a time when problems with meeting our water demands are growing.

During the drought of the 1990s, Texas instituted regional water planning, a process infused with local guidance of water planning in sixteen regions across the state. This process required a significantly more refined understanding of water resources in Texas, including the development of water availability models (WAMs) for water rights permitting of the major rivers and numerical groundwater availability models (GAMs) of the major and minor aquifers. As water becomes scarcer and scarcer and as people look closer and closer at water issues, the need grows for more water data and more thorough analysis of that water data.

DO WE HAVE THE LEVEL OF SCIENTIFIC UNDERSTANDING NEEDED TO ACCURATELY ASSESS THE SUSTAINABILITY OF GROUNDWATER AND SURFACE WATER RESOURCES?

We do not have the scientific understanding to assess the sustainability of our water resources at the level currently required by our policymakers and citizens. For groundwater, we need a better understanding of the outcrop processes that affect recharge, the primary parameter for estimating sustainability. These processes include evapotranspiration and surface water and groundwater interaction. Many of our aquifers have no field-measured estimates of recharge. Our aquifers in the western part of the state are often lacking basic hydrologic information related to hydraulic properties, flow paths, and quality.

DO WE HAVE AN ADEQUATE SCIENTIFIC UNDERSTANDING TO ADDRESS POTENTIAL WATER USE CONFLICTS?

We need more scientific studies to address potential interstate and international water conflicts. Streamgaging is less than adequate (less than 70 percent of needed gages are reporting data), and groundwater information is less than adequate (many aquifers with little information). Many water issues requiring more data are interstate and international in scope. Texas shares surface and groundwater resources with four states and Mexico. We have had surface water conflicts with New Mexico and Mexico (Rio Grande, Rio Concho, and Pecos River) and concerns about water conflicts with Oklahoma (potential export of surface and groundwater from reservations in Oklahoma to Texas and a potential reservoir in the Panhandle that would have affected Oklahoma). Other states face border issues as well. As demand for water grows, new issues and conflicts will appear. Good science is needed to understand the facts behind the issues so that fair and defensible solutions can be reached. More federal support in transboundary studies would help create a common database for resolving transboundary water issues.

WHAT FEDERAL INITIATIVES SHOULD BE UNDERTAKEN TO IMPROVE OUR SCIENTIFIC UNDERSTANDING IN THESE AREAS?

Federal agencies have a long history of working with Texas to lay a strong foundation for water policy and financial decisions. After Texas joined the United States in 1845, the U.S. military dug wells on the High Plains in search of artesian water in one of the first hydrogeologic studies in North America. The U.S. Geological Survey (USGS) arrived in the 1880s to begin seminal work to characterize the surface and groundwater resources of the central part of the state. Over the years, the U.S. Geological Survey worked closely with various state and local agencies to characterize water resources in the rest of the state and implement and maintain water monitoring networks.

Many local water-related activities are inherently federal in nature. Historical streamflow data are needed to accurately estimate the water supply yield and spillway requirements of a proposed reservoir; this data may derive from neighboring states. Two of Texas' largest reservoirs are located on state boundaries; two other major reservoirs are located on the border with Mexico.

Streamflow monitoring

In 1998, at the request of Congress, the USGS prepared a report entitled "A New Evaluation of the USGS Streamgaging Network" stating that the network's ability to meet long-standing federal goals was being compromised because of the loss of streamgages, particularly those with long periods of record, and the declining ability of the USGS to continue monitoring flow at high priority locations when local funding is discontinued.

In 1999, the USGS went to Congress to create the National Streamflow Information Program (NSIP) program. The vision of the program was to provide 100 percent funding for a base streamgage network and complement the continuous monitoring data with intense data collection during floods and droughts. There are 4,424 identified NSIP sites across the nation, and less than 70 percent are currently active and reporting data. This lack of basic data compromises our ability to conduct water resources research and assessments.

Assistance in meeting federal requirements

The permitting and construction of a dam and impoundment of a reservoir or any project that crosses a water course requires compliance with the Clean Water Act (U.S. Army Corps of Engineers) and the Endangered Species Act (U.S. Fish and Wildlife). The supporting studies require the compilation and analysis of large amounts of data, the burden of which is generally placed on the local sponsor. More federal support in collecting the data and guiding the studies would benefit both the

local sponsor and the federal interests, by ensuring that minimum standards of quality assurance on the data are met and that the ensuing studies are standardized and widely accepted.

Surface-water/groundwater interaction

The interaction between surface water and groundwater is important for understanding both resources. Groundwater discharge to rivers and streams amount to substantial amounts of water, especially in the drier parts of the state. For groundwater, understanding how much groundwater flows into rivers (what flows out of the aquifer is equal to recharge) and out of rivers into the aquifer (direct recharge) helps better understand how to manage groundwater resources and the effects of pumping on water resources. More federal support in characterizing these interactions on a basin-aquifer scale would be useful for developing better models and protecting natural resources.

Climate change

There remain significant uncertainties regarding the magnitude and impact of future climate change. What is known is that global temperatures are on the rise, as are sea levels. Most climate models also predict hotter summers and more evaporation for the United States in years to come; many predict increased hurricane activity and frequency of extreme weather events. Whatever our future climate looks like, it doesn't seem sensible to address the issue of climate change at the local level. Some kind of coordinated federal effort is needed to fully investigate the likely impacts of climate change and the recommend measures that need to be taken in order to minimize these impacts.

Research clearinghouse

Many different federal agencies conduct work associated with water. There should be one user-friendly Webpage that users can visit to find reports and data from all of the federal agencies related to water. The information could be site specific (for example, to a particular state) or of wider applications across a large area. This research clearinghouse would ensure that money invested by the federal government in research projects is available and being used by stakeholders.

SUMMARY

We do not have the scientific understanding to assess the sustainability of our water resources at the level currently required by our policymakers and citizens. We need more scientific studies to address potential interstate and international water conflicts. The federal government can assist in these issues by:

- expanding streamflow monitoring;
- assisting states in meeting Clean Water Act and Endangered Species Act requirements;
- researching the interaction between surface water and groundwater;
- assessing the effects of climate change on the nation's water resources; and
- developing a research clearinghouse.

Together, local, state, and federal governments can build a strong foundation of basic data and scientific solutions to for our water needs.

The CHAIRMAN. Thank you very much.

Our administration witnesses, we want to thank all of you for coming. Did you hear anything that prompts you to say something to us, which you just heard, any of you? Mr. Baldwin, Mr. Hirsh, Ms. Bach?

[No response.]

The CHAIRMAN. Do you have anything further?

Senator BINGAMAN. Mr. Chairman, if I could just ask a question. The Texas Water Development Board, I know you folks have endorsed the bill that we reported out of the Senate for a transboundary aquifer assessment along the U.S.-Mexico border. I believe that your board has gone on record in favor of that legislation.

In the last Congress I also had a bill that tried to get the Geological Survey authority and additional resources to pursue under-

ground aquifer monitoring in the Ogallala. Is that something that you would also support?

Mr. MULLICAN. The majority of my professional career was spent as a groundwater hydrologist, including a significant amount spent on the Ogallala Aquifer. There are many things that remain to be done on the Ogallala Aquifer and one of the things that we would like to work with you on on that particular piece of legislation is perhaps expanding what that legislation would allow, to go beyond the more basic aspects of that, because the Ogallala has had a lot of the basic hydrologic information collected, but looking at, for example, how can we enhance recharge to the Ogallala Aquifer, that is going to be—if we are talking about sustainability of a resource, we have got to look at mechanisms that would allow us to enhance recharge to the Ogallala.

When we worked with your staff on that, that was one of the major elements that we really wanted to emphasize with you, was that that would be something that we would very strongly support.

Senator BINGAMAN. We will try to get back with you on that and see if we can get your support. Thank you.

The CHAIRMAN. Anything further?

Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

I guess I looked at some of the comments from several of you and thought you should have been at the first part of the panel, because so much of what we have talked about today goes back to: Where is the water? Hop much water do we have? Once again, an incredible resource in this country, and we do not have a real accurate assessment of it. We have not mapped it, we have not surveyed it.

I am sitting in a situation in my State, I am trying to define what the watershed capability is for a large project. We do not have any stream monitoring systems. We have got 12 up there now and we need another 100 to actually make a dent in what we are doing up there. But we have not mapped our resource. Whether it is oil or whether it is gas or whatever the resource is, until we know what we have and where we have it, it is tough to say, well, we have got to conserve this much and we have got to be doing this much over there.

So I would just urge at the agency level, at the Department level: Let us identify what it is that we have. I am pleased to hear that within the National Groundwater Association you are working to push the monitoring that we need to do, to push the assessment.

We will work with you, but it seems like we have got the cart before the horse here on a lot of this. Until we know what we are dealing with, it is tough to make good solid policy decisions.

The CHAIRMAN. I want to thank all of you very much. I think the panel gave us some very good things to think about.

On GE, I just wanted to ask. You described this enormous research capacity and then you suggested that the Federal Government ought to do the research. Was I hearing you right or were you saying on desalinization improvement that you have reached the point where you needed some other science applied?

Mr. SABOL. You heard me right. I think, while there is a great deal of money that GE puts toward research and development, the

pace of change and the pace of what we need to develop can always be accelerated with additional funding. We think that putting additional funding toward desalinization membrane technologies can only get us ready for when we really know what our problem is and we will be prepared to deal with it.

The CHAIRMAN. Could I just ask you? Maybe you are not the right one, but I am rather upbeat about the possibility that desalinization will become economic in all respects, both the closed circle, get rid of the end product, and cost. Do your experts share the same thing?

Mr. SABOL. I am not sure that desalinization will ever be as cost effective as dealing with surface water, so treating a lake or a river, it is hard to imagine it will ever be that cost effective. But brackish water treatment can certainly become close to what it costs to treat surface water, and I think desalinization can be reduced to a point where it becomes a much more attractive alternative.

Senator BINGAMAN. I should have said "brackish." I think that we have ignored the inland brackish water in the United States. There is a lot of it in our State. That is what we are looking at, not the ocean water. And brackish is easier to clean up, some kinds of brackish water.

Mr. SABOL. Absolutely.

The CHAIRMAN. Thank you all very much. We stand adjourned. Thank you very much.

[Whereupon, at 5 o'clock p.m., the symposium was adjourned.]

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