CONJUNCTIVE WATER MANAGEMENT: A SOLUTION TO THE WEST'S GROWING WATER DEMAND?

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND RESOURCES

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

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CONJUNCTIVE WATER MANAGEMENT: A SOLUTION TO THE WEST'S GROWING WATER DEMAND?

WEDNESDAY, APRIL 5, 2006

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND RESOURCES,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:05 p.m., in room 2154, Rayburn House Office Building, Hon. Darrell E. Issa (chairman of the subcommittee) presiding.

Present: Representatives Issa and Kucinich.

Staff present: Larry Brady, staff director; Lori Gavaghan, legislative clerk; Tom Alexander, counsel; Dave Solan, Ph.D., and Ray Robbins, professional staff members; Richard Butcher, minority professional staff member; and Cecelia Morton, minority office manager.

Mr. ISSA. This meeting will come to order. A quorum being present, this hearing of the Government Reform Subcommittee on Energy and Resources will come to order.

Good afternoon.

We want to welcome our distinguished panel for today's subcommittee hearing. Today, we will highlight the growing demand for water in Western States and how conjunctive water management provides a partial solution.

Booming population growth, coupled with arid climates, have intensified the need for more efficient water supply management systems. In response, several methods have been employed to maximize water supply, such as conservation programs, construction of new dams, and desalination plants.

Despite these methods of water supply and infrastructure in California and throughout the West, we continue to remain vulnerable to an impending crisis. This issue is of paramount importance to my constituents in southern California and throughout the entire West.

Some experts propose that conjunctive water management is the leading and most effective method of resolving water shortage problems. Conjunctive—thank you, gentlemen. I know you will say it better than I do. Conjunctive water management is a tool which coordinates the use of surface and ground water, focusing on the creation of additional water storage.

This method of water management has the potential to double—I repeat, to double—the amount of on-demand water supply in my

home State of California. However, there also are some challenges to the expansion of conjunctive use management.

These include acquiring necessary resources to build new or refit current facilities, possible environmental problems—which we will deal with today—and lack of data on regional water tables.

The hearing today will provide an overview on how well current conjunctive water management projects are working. Our hearing will also address the benefits and shortcomings of conjunctive water management systems. Finally, we will look at the Federal role in the design, funding, or implementation of conjunctive water management systems.

I look forward to hearing from our distinguished panel today. And today, we have Mr. Jason Peltier, Deputy Assistant Secretary of water and science, Department of Interior.

Mr. Joseph Grindstaff, director of California Bay-Delta Authority. And Anthony Pack, general manager, Eastern Municipal Water District, Perris, CA, within my district, I will mention.

[The prepared statement of Hon. Darrell E. Issa follows:]

COMMITTEE ON GOVERNMENT REFORM
SUBCOMMITTEE ON ENERGY AND RESOURCES

OPENING STATEMENT OF
CHAIRMAN DARRELL ISSA

Oversight Hearing:

"Conjunctive Water Management: A Solution to the West's Growing Water Demand?"

April 5, 2006

Good afternoon everyone and welcome to our Subcommittee hearing. Today, we will highlight the growing demand for water in western states and how conjunctive water management provides a solution. Booming population growth coupled with arid climates has intensified the need for more efficient water supply management systems. In response, several methods have been employed to maximize water supply, such as conservation programs, construction of new dams, and desalination plants. Despite these methods, water supply and infrastructure, in California and throughout the West, are vulnerable to an impending crisis.

This issue is of paramount importance for my constituents in Southern California, as well as for the entire West.

Some experts propose that conjunctive water management is the leading and most effective method for resolving water shortage problems. Conjunctive water management is a tool which coordinates the use of surface and ground water, focusing on creating additional water storage.

This method of water management has the potential to double the amount of on-demand water supply in my home State of California. However, there are also some challenges to the expansion of conjunctive water management. These include acquiring the necessary resources to build new or retrofit current facilities, possible environmental problems, and lack of data on regional water tables.

The hearing today will provide an overview of how well current conjunctive water management projects are working. Our hearing will also address the benefits and shortcomings of conjunctive water management systems. Finally we will look at the federal government role in the design, funding, or implementation of conjunctive water management systems.

I look forward to hearing from our witnesses. Today we have:

- **Mr. Jason Peltier**, Deputy Assistant Secretary for Water and Science, Department of Interior
- **Mr. P. Joseph Grindstaff**, Director, California Bay-Delta Authority
- **Mr. Anthony J. Pack**, General Manager, Eastern Municipal Water District, Perris, CA

Mr. ISSA. I look forward to hearing all of your testimony, and I ask unanimous consent that the briefing memo prepared by the subcommittee staff be inserted in the record, as well as all relevant material.

Without objection, so ordered.

[The information referred to follows:]

COMMITTEE ON GOVERNMENT REFORM

Subcommittee on Energy and Resources

DARRELL ISSA, CHAIRMAN

Oversight Hearing:

Conjunctive Water Management: A Solution to the West's Growing Water Demand?

April 5, 2006, 2:00pm
Rayburn House Office Building
Room 2154

BRIEFING MEMORANDUM

Summary

Booming population growth in Western States during recent decades has intensified the need for a more efficient water supply management system. Western States have long suffered from water supply challenges due to their arid climates. In response, several methods have been employed to maximize water supply, such as conservation programs and the building of new dams and desalination plants. Despite these methods, water supply and infrastructure, particularly in California, are vulnerable to an impending crisis. The California Department of Water and Resources (DWR) estimates that if the current trend of population growth continues, California will need an additional 1-2 million acre-feet of water per year by 2030 to meet demand. There is, however, a management system that may provide a solution to California's challenges as well as those of other Western States.

Experts propose that conjunctive water management is the leading and most effective method for resolving water supply challenges. Conjunctive water management is the method by which surface and ground water are stored in reservoirs and below-ground aquifers for distribution during dry months. Though this method would nearly double the amount of on-demand water supply, the implementation of conjunctive water management raises several areas of concern. The first concern is whether existing waterways can support a switch to conjunctive water management. As it stands, a move to conjunctive water management would require a tremendous amount of investment to retrofit existing infrastructure and storage facilities. The second concern is whether the states have the necessary resources to build and maintain a conjunctive water management program. A

comprehensive conjunctive water management system would require massive funding for maintenance and qualified personnel to manage and maintain the proper facilities.

Another important concern is the environmental impact of implementing a conjunctive water management system. For instance, an aquifer could be rendered useless if the surface water that was pumped into it was contaminated by foreign molecules such as salt. Since most water used for irrigation purposes is not filtered, contaminated water could be detrimental to agriculture. Moreover, as a practical matter, the construction of waterways and storage facilities will undoubtedly disturb wildlife habitats. As such, any construction must conform to state, local, and federal environmental laws. These concerns, taken together, raise the larger issue of whether, and to what extent, the federal government should be involved in the design, funding, or implementation of a conjunctive water management system.

Background

For more than a century, the federal government has been involved in constructing water supply projects through the Bureau of Reclamation (Bureau) of the Department of Interior. Traditionally, Bureau projects were focused on supplying water for agricultural irrigation and homesteading rather than municipal uses, which were primarily the responsibility of local authorities. However, in many Western States, agricultural water requirements are now increasingly in conflict with municipal and industrial needs due to booming population growth and the scarcity of water.

Consequently, the Bureau has increased its presence in delivery of water for municipal uses. The Bureau is now the largest wholesaler of water in the country, and it manages hundreds of storage reservoirs and diversion dams in 17 western states, providing water to approximately 9 million acres of farmland and 31 million people. Therefore, the Bureau has expanded its mission to become a contemporary water management agency that assists Western States, Native American Tribes, and other parties in balancing competing uses while meeting new water supply needs.

Conjunctive Water Management:

Conjunctive Water Management, also called Integrated Water Resources Management, consists of three primary components. The first is to recharge groundwater into an aquifer when surface water is available to increase groundwater storage. An aquifer consists of a mass of water flowing though the pores and cracks below the Earth's surface. Groundwater recharge is the movement of surface water from the land surface, through the topsoil and subsurface, and into de-watered aquifer space. In some areas this is accomplished by reducing groundwater use and substituting it with surface water, allowing natural recharge to increase groundwater storage. The second component is to switch to groundwater use in dry years when surface water is scarce. The third component is to have an ongoing monitoring program to evaluate and allow water managers to respond to changes in groundwater, surface water, or environmental conditions. Conjunctive water management is most widely used in western states including Arizona, California,

Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming.

Potential Cost of Conjunctive Water Management:

Grant applications from the California Department of Water and Resources (DWR) Fiscal Year 2001-2002 Conjunctive Water Management Program show cost ranging from $10 to $600 per acre-foot of increase in average annual delivery. This wide range of costs is due to many factors including project complexity, regional differences in construction and land costs, availability and quality of recharge supply, availability of infrastructure to capture, convey, recharge and extract water, intended use of water, and treatment requirements. In general, urban uses can support higher project costs than agriculture uses. The average cost of all applications received by DWR is $110 per acre-foot of increase in average annual delivery.

Primary Benefits of Conjunctive Water Management:

- **Improved Water Supply Reliability.** Conjunctive water management has the potential to increase average annual water supply throughout the State of California by 500,000 acre-feet with 9 million acre-feet of "new' groundwater storage.

- **Reduced Groundwater Overdraft and Land Subsidence.** Conjunctive water management in the Santa Clara Valley Water district has virtually stopped land subsidence caused by heavy groundwater use and has allowed groundwater to recover to a level last seen in the early 1900s.

- **Wildlife Habitat.** Conjunctive water management can provide environmental benefits when recharge basins are designed to be compatible with wildlife habitat, such as using natural floodplains and wetlands as recharge areas.

Primary Concerns Regarding Conjunctive Water Management:

- **Lack of Data.** There is rarely a complete regional network to monitor groundwater levels, water quality, land subsidence or the interaction of groundwater and the environment. Data is needed to evaluate conditions and trends laterally over an area, vertically at different depths, and over time. However, private property owners are often reluctant to provide information or allow access to collect additional information on groundwater. The result is that decisions are often made with only approximate knowledge of the water basin. This uncertainty can make any change in groundwater use controversial. Additional investment in a monitoring network and data collection can greatly reduce the uncertainty, but must be done in accordance with a groundwater management plan that is acceptable to all stakeholders in the basin.

- **Infrastructure and Operational Constraints.** Physical capacities of existing storage and conveyance facilities are often not large enough to capture surface water when it is available in wet years. Operational constraints may also limit the ability to use the full physical capacity of facilities.

- **Surface Water and Groundwater Management.** In California, water management practices and the water rights system treat surface water and groundwater as two unconnected resources. In reality, there is often a high degree of hydrologic connection between the two. Failure to understand the connection can lead to unintended environmental impacts.

Conjunctive Water Management in California: California Bay-Delta/CALFED

On October 25, 2004, the President signed into law P.L. 108-361 (H.R. 2828), which authorized implementation of the California Bay-Delta Program/CALFED. The initial authorization for CALFED funding (P.L. 104-208, Division E) was in response to a 1994 agreement among state and federal agencies, urban, agriculture, and environmental interests to protect the Bay-Delta while satisfying the primary needs of the various interests involved. A Record of Decision (RoD) for the current CALFED program was issued by a consortium of state and federal agencies in August 2000.

CALFED was created to address critical water quality, water supply and fish and wildlife issues in the 738,000 acre Bay-Delta estuary and has grown into a comprehensive effort to address long-term water supply/quality issues for most of California. The CALFED RoD anticipates that the program will increase groundwater storage by an additional 500,000 to 1,000,000 acre-feet. Consequently, efforts are underway across the State of California to design and develop conjunctive water management programs. P.L.108-361 also authorizes $389 million for the federal share of the cost for activities authorized under the Act for FY 2005-FY 2010.

This hearing will address;

- What conjunctive water management projects are currently being implemented;

- The benefits and shortcomings of a conjunctive water management system;

- The extent to which the federal government should be – or in the very least is compelled to be – involved in the design, funding or implementation of a conjunctive water management system.

Witnesses:

- **Mr. Jason Peltier**, Deputy Assistant Secretary for Water and Science, Department of Interior
- **Mr. P. Joseph Grindstaff**, Director, California Bay-Delta Authority
- **Mr. Anthony J. Pack**, General Manager, Eastern Municipal Water District, Perris, CA

STAFF CONTACT

Larry Brady, Staff Director
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Mr. ISSA. Now for the opening statement, I will yield to the gentleman from Ohio, who is serving for the ranking member today.

Mr. Kucinich.

Mr. KUCINICH. Thank you very much, Mr. Chairman.

I was called by Congresswoman Watson and informed that a death in her family made it imperative that she attend a service in California, and I am glad to fill in so we can start this hearing.

After I make this statement, I am going to have to go to another previously scheduled meeting. But I want to welcome the witnesses, and I want to thank the Chair for calling this hearing on conjunctive water management.

Mr. Chairman, the need for reliable, high-quality water sources in the United States is clear. The population continues to grow steadily, especially in the arid, thirstiest parts of the country. Demand for water is growing even faster.

In fact, many experts fear that the thirsty and rapidly growing Southwestern United States will need water so desperately that it will soon become financially viable for them to try to divert it from the Great Lakes. And that region is expected to experience more frequent, prolonged, and more severe droughts as a result of climate change, making the outlook even more dire. We must look for alternatives.

As has been stated before, conjunctive water management is the simultaneous operation of surface water storage and use, ground water storage and use, and conveyance facilities to meet water management needs and crop demand. In a nutshell, it allows storage of large quantities of water, which would help areas weather the fluctuations in water supply that climate change will bring.

For several decades, the Federal Government, along with many State and local governments, has used conjunctive water management projects for a variety of purposes, such as flood control, power generation, irrigation, and several other purposes. It has also been a resource to improve water supply reliability and protect water quality to improve environmental conditions.

At the same time, there are concerns, especially about potential environmental effects. If the recharge water is contaminated, an entire water supply could be permanently ruined. For example, an illegal discharge of a gallon of gas is enough to render millions of gallons of water undrinkable. If the recharge water will filter through the soil to reach the storage aquifer, some contaminants might still make it through to the water, even in tight soil.

The lands required to allow such infiltration through soil can concentrate water contaminants over time in the soil, rendering the land useless in the future. And the physical infrastructure could adversely affect wildlife habitats.

Conjunctive water management has the potential to alleviate some of the pressure on an expanding population and economy. But we must move forward with our eyes open to ensure our environment is fully protected. And I am hopeful that the testimony before this subcommittee today, Mr. Chairman, will help the Congress better understand some of the potential benefits and pitfalls of conjunctive water management.

I yield back my time, and I thank the Chair.

Mr. ISSA. Thank you, Mr. Kucinich.

As is the rule of this subcommittee, I would ask that all the witnesses and any persons who may advise the witnesses rise to take the oath, please.

[Witnesses sworn.]

Mr. ISSA. Let the record show all answered in the affirmative.

And thanks again, Mr. Kucinich.

Now I will give you the good news and the bad news here today. The good news is that we won't hold you strictly to your 5 minutes for your presentations. The additional good news is that your entire written statement will be placed in the record. So you need not repeat it, if you choose not to.

Now, the bad news is at some time, potentially, between now and 3, there will be an unexpected vote, at which time this will end. So the time used, you know, if a vote gets called, we will not make up.

Additionally, because of a classified briefing being held today, this hearing must end at 3. So I don't expect us to go past that, but I wanted to give you all that opportunity.

And last, but not least, I want to ask if you would all agree, since many Members are in other committee markups right now, to answer additional questions placed to you in writing after the hearing? OK. Then by unanimous consent, I would ask that we be able to do that. And so ordered.

We will begin with Mr. Peltier.

STATEMENTS OF JASON PELTIER, DEPUTY ASSISTANT SECRETARY FOR WATER AND SCIENCE, DEPARTMENT OF INTERIOR; P. JOSEPH GRINDSTAFF, DIRECTOR, CALIFORNIA BAY-DELTA AUTHORITY; AND ANTHONY J. PACK, GENERAL MANAGER, EASTERN MUNICIPAL WATER DISTRICT, PERRIS, CA

STATEMENT OF JASON PELTIER

Mr. PELTIER. Thank you, Mr. Chairman.

I'm pleased to be here today and to talk about conjunctive use with the subcommittee. Indeed, in your opening statement, you put your finger on it. There is an expanding use of this water management strategy where it is possible.

It's not possible—it takes a right combination of surface and ground water resources to be able to make it work. But it is indeed—we're seeing increased use of this approach.

I'm going to talk a little bit about the Bureau of Reclamation's role, but also about the U.S. Geological Survey role because they both have unique and can make significant contributions to conjunctive use.

Relative to the Bureau of Reclamation, it's important to recognize that Reclamation's role in all cases that I'm aware of—and I will give you some specific examples—but it focuses on supplying surface water. Reclamation is on the surface water side of the equation. We are very deferential to State law, which regulates ground water. And so, as a matter of water rights law, we stay away from injecting ourselves—and excuse the pun—into this—into local conjunctive use projects.

There's another Federal component also, which is on the regulatory side, and that has to do with compliance with the Clean

Water Act and the Endangered Species Act. Those are outside of Reclamation or the GS's purview. But we are all mindful that those processes do exist.

I'd like to give you a few examples. One, starting in California. Many of the customers of the Bureau's Central Valley Project do participate in water banks, local water banks. In fact, also the entire Friant Division of the Central Valley Project, approximately a million acres from Bakersfield to Fresno, is one large conjunctive use program. Not operated by us, but our customers—when in years like this, when there's ample surface water, will turn their wells off. Natural recharge will occur, and in drier years, when we cannot deliver surface water, they will turn their wells on, and that's the way they will sustain their irrigation.

In Arizona, unused—Central Arizona Project water is stored underground in the Arizona water bank for use in future years, when the allocation may not be adequate for Arizona's needs. They can then withdraw from their water bank.

In Washington State, a program was developed for local users to pump ground water and store it artificially in a surface reservoir, which has provided a multitude of benefits and maximized use of the Federal facility. Reclamation is also working with the city of Albuquerque in New Mexico on a project to reuse industrial and municipal effluent, to treat and put it underground for future use.

So Reclamation has a number of roles. Mostly, though, it is working with their local customers who have the resource to match up to the surface water.

The U.S. Geological Survey has a number of unique scientific capabilities and skills that they bring to the table to assist local entities that are trying to develop conjunctive use programs. They can provide hydrologic data for planning of these systems. They can provide hydrologic modeling and have techniques to help the planning and design process.

They can apply their ground water models to specific regional systems to evaluate the potential for conjunctive use. And they also have a wealth of hydrologic data that goes into the planning processes for these projects.

As I said, most of the GS's work is conducted through the U.S. GS Cooperative Water Program, and that's on a cost-share basis with local interests. We try to match up our skills and capabilities with the needs of our partners and work together in that constructive manner.

In addition, GS has the capability to provide monitoring of existing and then once constructed facilities to give the project managers the ability to understand—know and understand how the project is going to perform and is performing.

So, in summary, I would just say that we do see it as you do, Mr. Chairman, as a valuable tool. A tool that avoids—and as Mr. Grindstaff will let you know, in California, there has been a significant investment in conjunctive use ground water programs. In fact, significant progress has been made.

And while there is, as you say, significant interest in surface water projects, these ground water projects are quicker, easier to get off the ground. The only caution that I would have is, that we need to be mindful of, I think, is that a lot of ground water banks

and conjunctive use programs have been developed over the last decade in California, where conditions have been relatively wet.

So I don't think we've experienced—we haven't tested the withdrawal part of the formula. We've tested and are capable of getting the water underground. When we have repeat of 1977 or the drought of the late 1980's and we have to extract, that's when we'll see whether the projects that we're investing in today really work.

Thank you.

[The prepared statement of Mr. Peltier follows:]

Testimony of Jason Peltier
Deputy Assistant Secretary for Water and Science
U.S. Department of the Interior
before the
U.S. House of Representatives
Committee on Government Reform
Subcommittee on Energy and Resources
on
"Conjunctive Water Management: A Solution to the West's Growing Water Demand?"
April 5, 2006

Mr. Chairman and Members of the Committee, it is a pleasure to appear today to discuss conjunctive water management.

Conjunctive water management is increasingly being utilized by local water providers throughout the West as they come to the realization that in many locations, there simply is not enough surface water or ground water available, at the right times, to meet water demands. Given the growing and changing demand for water and given that non-structural solutions usually follow structural (i.e., reservoirs), non-structural solutions such as conjunctive water management can improve the efficiency and effectiveness of water delivery systems and are important contemporary issues in the West.

In the mid-twentieth century, farmers and water managers from the Great Plains to Phoenix to California's Central Valley developed an increasingly-heavy dependence on ground water to meet their needs. In locations not served by large surface water storage projects, this was often their only source of water. However, continued pumping over the years has drawn down water tables in some areas, pumping has become more costly, and ground subsidence has been observed. As local water users and providers have witnessed decline of their ground water sources, they have expanded their water portfolios to jointly manage and use ground water and surface water.

Conjunctive water management is therefore a state- and locally-driven endeavor. Under western water law, states exercise jurisdiction and control over their ground water and surface water resources. The Federal government has a long and proud history of creating surface water storage to assist local entities in capturing water for beneficial uses. Bureau of Reclamation projects have generally provided surface water that can be managed jointly with ground water, while the US Geological Survey has conducted research to develop an understanding of surface water and ground water systems and their interaction.

BUREAU OF RECLAMATION

Participation of the Federal government in conjunctive water management projects is on a case-by-case basis, often in relation to preexisting Federal projects. Following are examples of the Bureau of Reclamation's involvement in conjunctive management in each of its five regions.

Central Valley, California
In recent years, banking surplus surface water supplies in ground water aquifers has become a widespread type of conjunctive use of water, referred to generally as "water banking." A number of Central Valley Project (CVP) contractors have entered into long term agreements with the operators of water banking projects, primarily in Kern County, where conditions for ground water storage tend to be good.

Kern Tulare and Rag Gulch Water Districts are CVP contractors who get delivery of their CVP water through the Cross Valley Canal. In the past several years, deliveries to their customers have been limited, resulting in supply shortages in dry years. In response, these districts have entered into long term water banking arrangements with Kern County districts. This provides the ability to store surplus water when it is available, providing water supply reliability in dry years.

Phoenix, Arizona
The Salt River Project (SRP) stores surface water from the Salt and Verde Rivers in reservoirs, and also has rights to pump ground water. Both supplies are used routinely to meet area demands for water. In drought years, ground water supplies are used extensively; in wet years, surface water is relied on more extensively and used to recharge the aquifer for future use.

The Central Arizona Project (CAP) brings Colorado River water into central Arizona, storing water in a regulating reservoir on the Agua Fria River. Originally, there was no conjunctive use envisioned within the CAP because it included no ground water supplies. It was envisioned that agriculture would be able to utilize all of the CAP water in early years of the project. However, due to the high cost of CAP water and the agricultural economy, CAP water in excess of demands for direct use is now recharged and stored underground for future use in time of declared shortages on the Colorado River. The Arizona Banking Authority was developed to ensure that Arizona's entire allocation could be utilized by storing any excess CAP water in ground water banks for future use.

In Phoenix, as in many other cases, Federal involvement is limited to supplying surface water through Federal facilities, with the water districts or individual users managing the ground water.

Wichita, Kansas
The Equus Beds Aquifer has supplied water to the City of Wichita, Kansas since the 1940s. Water tables have declined up to 40 feet in the area of the City's well field. In 1998, the State of Kansas issued the City a conjunctive use water rights permit that replaced and combined two previous City permits, one for Reclamation's Wichita Project, the other for the Equus Beds Aquifer. By combining the permits for these two resources into a single, integrated operation, the City can more effectively and economically deliver water to its customers. The resulting change in ground water use will reduce the stress on the aquifer and allow for increased aquifer recharge.

In addition, the City and Reclamation began planning studies and environmental analyses of an Equus Beds recharge demonstration project in the mid 1990s. The City plans to implement the project and is seeking legislation to amend the Wichita Project authorization (P.L. 86-787, September 14, 1960) to incorporate the Equus Beds as a division of the existing project. Reclamation has testified that the project is well conceived and planned, but that given

Reclamation's tight budget, we are not in a position to support the addition of this project to the long list of projects waiting for Federal funding. This project is similar to many conjunctive use projects in that it would produce significant, but purely local, benefits. Local communities may in many cases wish to pursue conjunctive use projects and Reclamation wants to encourage them to do so, but we believe that Federal money must be targeted towards issues where there are Federal responsibilities.

Quincy, Washington
The Quincy Ground Water Subarea is a ground water area designated under Washington State law and jointly managed by Reclamation and the Washington State Department of Ecology (Ecology). Its ground water "mound" was formed as surface and subsurface flows were contained by O'Sullivan Dam, part of Reclamation's Columbia Basin Project. A portion of the artificially stored ground water was made available for use in 1973, when Reclamation was granted a declaration of claim to the ground water located within the Subarea. Under the resulting program, users may pump Federal ground water for irrigation and municipal and industrial purposes after acquiring a well permit from Ecology and a ground water license from Reclamation that stipulates requirements and parameters for using this water. The program has allowed re-use of project water supplies not originally contemplated when the project was constructed and ensures that users of this water do not interfere with existing and future project needs.

Albuquerque, New Mexico
Historically, the City of Albuquerque relied exclusively on ground water to meet its potable and non-potable municipal water needs. The result has been unsustainable mining of its aquifer. The City has partnered with the Reclamation since 1996 to begin using San Juan-Chama Project surface water and promote sustainable, conjunctive water management. The Albuquerque Metropolitan Area Water Reclamation and Reuse Project fosters conjunctive surface water and ground water use by reusing industrial and municipal effluent and reclaiming naturally impaired surface water and ground water to meet non-potable needs. Once complete, this project will provide up to 6,000 acre-feet per year of recycled surface and ground water to meet irrigation and industrial uses.

U.S. GEOLOGICAL SURVEY

We are pleased to work with our partners in programs like those I just mentioned. In addition to the Bureau of Reclamation's assistance in supplying water, the U.S. Geological Survey provides support to State and local agencies contemplating or using conjunctive water management by providing:

1) hydrologic data for planning of conjunctive water management systems,

2) hydrologic modeling techniques suitable for planning and designing of conjunctive management systems,

3) application of models to specific regional systems to evaluate the potential application of conjunctive management, and

4) hydrologic data that are needed by the operators of these systems to provide continuing feedback on the effectiveness of the systems so that operations can be improved over time.

Most of the USGS efforts are conducted through the USGS Cooperative Water Program on a cost-shared basis with State, local, or tribal governments. Some of the fundamental research and development of simulation models is conducted through the USGS Ground Water Resources Program and USGS Hydrologic Research and Development Program. All of the research and modeling software developed by the USGS is freely available from USGS publications and web sites.

The design of conjunctive water-management systems requires a basic understanding of the water-budget components and hydrologic processes within a watershed. Monitoring of streamflows, ground-water levels, and other hydrologic variables provides information on the availability of water within a watershed, as well as the interaction of ground-water and surface-water systems. Water-use data also are needed to track changes in the supply and demand of ground- and surface-water resources over time. These are all parts of the USGS contribution to advancing the scientific underpinnings of conjunctive management.

Many conjunctive-use systems involve artificial recharge of surface water (whether potable, reclaimed, or waste-stream discharge) into the subsurface for purposes of augmenting or restoring the quantity of water stored in developed aquifers. Several different approaches for artificial recharge are used, and the USGS has provided monitoring and analysis in support of improved understanding of the physical, chemical, and microbiological factors that affect the operation and success of artificial-recharge projects. Some of the methods of artificial recharge in which the USGS has provided scientific monitoring and analysis are:

- Artificial-recharge basins and(or) recharge wells to store excess surface water in aquifers during high streamflow periods for later use during peak water-demand cycles (Antelope Valley, southern California; Wichita, Kansas). The potential benefits of storing surplus surface water by artificial recharge include a more stable source of water supply.
- An instream ground-water recharge facility along Rillito Creek in Tucson, Arizona.
- Bank-filtration projects along the Platte River, near Lincoln, Nebraska, and along the Great Miami River near Cincinnati, Ohio. Bank filtration is the process in which ground-water supply wells located next to surface-water bodies draw some of their discharge from the surface-water source through the river-bank material and into the well. The process has been used to remove potential contaminants from surface water, and can be thought of as pretreating the water.

During the past several decades, computer simulation models have played an increasing role in the analysis of conjunctive-management systems, and the USGS has been in the forefront in model development and real-world applications. On the model-development side, the USGS has developed computer models for both ground-water and surface-water analyses, and is currently working to directly couple two of its most widely-used ground-water and surface-water models into a single, comprehensive modeling tool. The resulting computer model, which is being field tested on data from Sagehen Creek Basin on the eastern slope of the Sierra Nevada range of California, will be applicable to the evaluation of conjunctive-management projects in

hydrologically complex, large-scale watersheds. In collaboration with university researchers, the USGS has also recently released a ground-water management computer program that can be applied to the design and evaluation of many types of conjunctive-management issues, such as determining optimal ground-water pumping strategies that limit instream-flow reductions.

The USGS has worked collaboratively with many western State and local agencies in the development and application of computer models for analysis of conjunctive-management projects. Recently, the USGS worked with the City of Albuquerque in the development and application of a conjunctive-management computer model for the ground-water and surface-water resources of the Albuquerque area for the project described previously in which the Bureau of Reclamation is also participating. The computer model helped determine the effects of ground-water pumping on streamflow leakage from the Rio Grande and storage depletions within the aquifers. The goal of the management model was to determine optimal ground-water withdrawal strategies to achieve particular objectives with respect to the river-aquifer system, such as limiting total leakage of river water to the aquifer.

It is clear that effective water-resources management will require that surface-water and ground-water resources be viewed as a single resource, and that the reliable yield of a system that includes both surface and ground water, when managed together, can be vastly larger than the sum of the yields of the two systems operated individually. The USGS has more than a century of experience working with Federal, State, local and tribal governments, developing and applying hydrologic science to the effective management of water resources. The science conducted by the USGS in this area is highly beneficial to many communities across the Nation that have been a part of these collaborations. The USGS also makes the results of these collaborative studies available through a wide variety of literature, data bases, and computer simulation models, all available freely. The USGS has summarized a number of recent studies related to conjunctive management in a report "Evolving Issues and Practices in Managing Ground-Water Resources: Case Studies on the Role of Science," USGS Circular 1247. http://pubs.usgs.gov/circ/2003/circ1247/

CONCLUSION

Conjunctive management of surface and ground water resources will increase as population growth places increasing stress on water supplies. The Federal government will continue to cooperate with states and water providers as they develop and implement these programs. This concludes my testimony.

Mr. ISSA. Thank you.

I will take that there has never been a run on the bank, and we are waiting for a 1929 test.

OK? Only I can say that, I suspect.

Mr. Grindstaff.

STATEMENT OF P. JOSEPH GRINDSTAFF

Mr. GRINDSTAFF. Thank you very much, Mr. Chairman.

I won't refer to my written testimony, but I'll talk about our experience. I actually have experience both at a local and regional level and now at the State level.

In California, 15 years ago, everyone knew that conjunctive management was a great thing to do, that ground water storage was really important. Over the last 15 years, we've developed more than 7 million acre-feet of ground water storage.

Jason is absolutely right. We have yet to test the extraction because we've really been in a wet cycle since then. But I think even the most optimistic person 15 years ago would never have guessed that we could actually develop the amounts of ground water storage that we've developed today.

The State's role has been, in some cases, to help finance technical studies, and we've invested hundreds of millions of dollars in helping to do that across the State. In some cases, helping to build facilities, both facilities to put water in and extraction facilities, and in general to encourage that.

I also want to point out that you are exactly right in your opening remarks. This is only a part of the solution. Without having the conveyance and the ability to take surface water deliveries when times are wet, having a place to store water doesn't do us a lot of good. So we really have to have a full program in order to truly develop conjunctive use programs.

I also want to address water quality problems. One of the things that happens as you store water is not that you put poor quality water in, but that when you put water in, you actually raise the ground water table. And it comes up into an area where there is contamination.

So one of the largest costs that sometimes occurs actually, is the cost of treating water when you extract it. Some of the contamination problems are natural. So you may find an aquifer that has high arsenic, for example, and that can be a challenge.

But given our need in the West—and in the world, really—for a reliable water supply, it's the kind of investment we have to make. We're past the time of cheap alternatives. We're in a time where we truly have to invest in the future, and we have to understand that some of those things are going to cost more money than we would have paid in the past. But they're worth it.

20 years from now, people will say, boy, those people were visionary because they invested in these things. They cost a lot, but they're very much worth it.

The other point that I'd really like to make is that, in some cases, doing conjunctive management dramatically improves water quality in a region. So there is conjunctive management, for example, what the Orange County water district is doing, where they're

taking recycled water, running it through desalters, and putting that water—or they're planning to put that water into the ground.

That will dramatically improve the water in the Orange County ground water basin, in addition to firming up their supply. So these projects can have multiple benefits that truly are farsighted.

With that, thank you very much.

[The prepared statement of Mr. Grindstaff follows:]

Testimony of
P. Joseph Grindstaff, Director
California Bay-Delta Authority

before the
Subcommittee on Energy and Resources

of the
Committee on Government Reform
United States House of Representatives

regarding
Conjunctive Water Management:
A Solution to the West's Growing Demand?

April 5, 2006

Testimony of
P. Joseph Grindstaff, Director,
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before the
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Regarding

Conjunctive Water Management: A Solution to the West's Growing Demand?

Chairman Issa and members of the Subcommittee on Energy and Resources, I appreciate the opportunity to appear before you today to discuss conjunctive water management. I have been intimately familiar with conjunctive water management – also known as conjunctive use – both as a manager for local and regional water agencies in Southern California, and later as Chief Deputy Director for the California Department of Water Resources. I am currently the Director of the California Bay-Delta Authority.

Today I would like to provide an overview of conjunctive water management. I will also provide you with some examples of how it works across California and discuss some of the major challenges facing us. Finally, I will conclude with recommendations about how this vital form of water management can be improved.

The recently released update of the California Water Plan recognizes the need for a comprehensive approach and the need to work cooperatively in order to succeed in managing the state's water resources. The Plan looks at water as a resource whose management involves many responsibilities and raises many issues.

I am a firm believer that the water supply and reliability issues facing California and, frankly, many other parts of the nation and the world, cannot be solved by any one management strategy implemented by any one level of government or private sector enterprise. Only by using all the management options available, and through collaboration and cooperation at all levels of government and the private sector, will we be able to meet the demands of a growing population, maintain economic growth and prosperity, and do all this in a way that preserves and protects the natural environment.

Conjunctive water management is a vital part of that water management portfolio. It has been practiced in California to varying degrees since the Spanish mission era. The first known artificial recharge of groundwater in California occurred in Southern California during the late 1800s and is now used as a management tool throughout the state.

What is Conjunctive Management?

There are three primary components to a conjunctive water management project when the primary objective is to increase average water deliveries:

- The first is to recharge groundwater when surplus surface water is available to increase groundwater storage. In some areas this is accomplished by reducing groundwater use and substituting it with surface water, thus allowing natural recharge to increase groundwater storage. Another term for this is in-lieu recharge.
- The second component is to switch to groundwater use in dry years when surface water is scarce.
- The third component is to have a groundwater management institutional structure and an ongoing monitoring program to evaluate and allow water managers to respond to changes in groundwater, surface water, or environmental conditions that could violate management objectives or impact other water users.

Together, these components comprise a conjunctive water management project. Conjunctive water management projects may have other objectives in place of or in addition to improving average water deliveries. These other objectives may include improving water quality, reducing salt water intrusion, and reducing groundwater overdraft and land subsidence.

During the last three years, the Conjunctive Water Management Branch of the California Department of Water Resources has implemented several integrated programs to improve the management of groundwater resources in California. These improvements cover many facets of groundwater management. They include developing a basic understanding of individual groundwater basins, identifying basin management strategies or objectives, planning and conducting groundwater studies, and designing and constructing conjunctive use projects. The goal is to increase water supply reliability statewide through the planned, coordinated management and use of groundwater and surface water resources.

When the Conjunctive Water Management Program was formed seven years ago, local agencies had little trust in the overall objectives of the Program and minimal interest in participating. Since that time, the commitment to supporting local management of groundwater resources has allowed the Program to establish strong relationships with many local agencies. The Program has been able to fulfill commitments made to assist our partners' efforts to plan and implement conjunctive water use projects pursuant to the Program goal while, at the same time, providing both local management opportunities and water supply system reliability measures.

There is no comprehensive statewide data on the planning and implementation of conjunctive water management at the local agency level, but the Department of Water Resources' Conjunctive Water Management Program provides an indication of the types and magnitude of projects that water agencies are pursuing. Over the past five years, the Program awarded more than $250 million in grants and loans to leverage local and regional investment in projects throughout California with total costs more than $1billion. When fully implemented, the projects will provide more than 300,000 acre-feet of new water deliveries.

Examples of Conjunctive Management

Some examples illustrate the types of conjunctive management under way on a regional and local scale. In Southern California, including Kern County, conjunctive management has increased average-year water deliveries by more than 2 million acre-feet. Since 1990, artificial recharge in Kern County has helped to increase the water now in groundwater storage by 5.5 million acre-feet.

Santa Clara Valley Water District releases local supplies and imported water into more than 20 local creeks for artificial in-stream recharge and into more than 70 recharge ponds with an average annual recharge capacity of 138,000 acre-feet. Conjunctive management has virtually stopped land subsidence caused by heavy groundwater use and has allowed groundwater levels to recover to those of the early 1900s.

The Groundwater Replenishment System is a groundwater protection and water supply project jointly sponsored by the Orange County Water District and Orange County Sanitation District. The project will take highly treated urban wastewater and treat it to near distilled water quality using advanced membrane purification technologies. The water will be used to expand an existing underground seawater intrusion barrier as well as augment local groundwater supplies. The schedule calls for Phase 1 of the project to produce up to 72,000 acre-feet per year of recycled water, enough for 144,000 families each year, beginning in the Fall of 2007.

While conjunctive water management has been most prevalent in overdrafted groundwater basins, it can be applied in more water-rich areas as well. In the Sacramento Valley, water users are developing programs to use groundwater while transferring surface water to Delta exporters. The storage space created is often naturally refilled the following winter during times of surface water surplus.

Potential Benefits from Conjunctive Management

Conjunctive management is used to improve water supply reliability, to reduce groundwater overdraft and land subsidence, to protect water quality, and to improve

environmental conditions. Conservative estimates of additional implementation of conjunctive management indicate the potential to increase average annual water deliveries throughout the state by 500,000 acre-feet, with 9 million acre-feet of "new" groundwater storage. This new storage includes both re-operation of existing groundwater storage and recharging water into de-watered aquifer space. More aggressive estimates from screening level studies indicate the potential to increase average annual water deliveries by 2 million acre-feet with about 20 million acre-feet of new storage. The more aggressive estimates are based on assumptions that require major re-operation of existing surface water reservoirs and groundwater storage to achieve the benefits and do not fully consider the conveyance capacity constraints for exports from the Delta and other conveyance facilities.

The potential benefits from additional conjunctive water management are highly dependent on adequate water quality and the ability to capture, convey, and recharge surface water. These estimates are based on increases in local water deliveries from individual projects with project-specific sources of recharge supply and do not necessarily reflect a statewide increase in supply reliability. An increase in statewide supply reliability only occurs when the individual projects use water that would otherwise not be used by other water users or that is not needed for regulatory requirements such as water quality, fish and wildlife, and navigation. Expanding existing or developing new storage or conveyance infrastructure can increase the flexibility and ability to conduct conjunctive management projects. It is also possible to re-operate the existing system and to improve the underlying operational conditions to overcome these constraints.

In addition to water supply benefits, conjunctive management can provide environmental benefits when recharge basins are designed to be compatible with wildlife habitat, such as using natural floodplains and wetlands as recharge areas. Re-operation of surface water storage and using the water conjunctively with groundwater can avoid impacts to aquatic species by allowing better management of in-stream flow and water quality conditions.

Major Issues Facing Additional Conjunctive Management

Lack of Data – There is rarely a complete regional network to monitor groundwater levels, water quality, land subsidence, or the interaction of groundwater with surface water and the environment. Data is needed to evaluate conditions and trends on three planes: laterally over an area, vertically at different depths, and over time. Also, there is often a reluctance of individuals who own groundwater monitoring or supply wells to provide information or allow access to collect additional information. The result is that decisions are often made with only approximate knowledge of the system.

This uncertainty can make any change in groundwater use controversial. Additional investment in a monitoring network and data collection can help reduce this uncertainty, but must be done in accordance with a groundwater management plan that is acceptable to stakeholders in the basin.

Legal and Institutional issues – In many areas, political, institutional and legal obstacles stand in the way of implementing conjunctive use projects and effectively managing groundwater resources. For example, we need to encourage better coordination of groundwater management actions, which commonly are implemented under the authority of local water agencies, with land use decisions made by cities and counties. Land use decisions that lead to paving, channel lining, and other changes can have a major impact on the capacity to naturally recharge groundwater. Groundwater management agencies also must be involved early on in zoning and permitting for potential contamination from industry or septic systems.

County governments increasingly are becoming active in the area of groundwater management, with 27 of California's counties currently having groundwater ordinances. These ordinances are not always consistent or coordinated with local water agency groundwater management plans. Local governments and water agencies also need to resolve the potential for conflict that can arise when land is purchased for groundwater recharge facilities, thereby removing it from the local tax base.

As another example, the increasing use of aquifers for groundwater storage can lead to concerns or conflict over storage rights vs. water rights. Although the courts have adjudicated the water rights in many Southern California groundwater basins, the judgments are not always clear with respect to the right to store additional water in available aquifer space.

Infrastructure and Operational Constraints – Physical capacities of existing storage and conveyance facilities are often not large enough to capture surface water when it is available in wet years. Operational constraints may also limit the ability to use the full physical capacity of facilities. For example, permitted export capacity and efforts to protect fisheries and water quality in the Delta often limit the ability to move water to groundwater banks south of the Delta. Facilities that are operated for both temporary storage of flood water and groundwater recharge require more frequent maintenance to clean out excessive sediment often present in flood water.

Surface Water and Groundwater Management – In California, water management practices and the water rights system treat surface water and groundwater as two unconnected resources. In reality, there is often a high degree of hydrologic connection

between the two. Under predevelopment conditions, many streams received dry weather base flow from groundwater storage, and streams provided wet weather recharge to groundwater storage. Water quality and the environment can also be influenced by the interaction between surface water and groundwater. Failure to understand these connections can lead to unintended impacts. For example, studies by the University of California, Davis, indicate that long-term groundwater pumping in Sacramento County has reduced or eliminated dry season base flow in sections of the Cosumnes River with potential impacts to riparian habitat and anadromous fish.

In California, authority is separated among local, state and federal agencies for managing different aspects of groundwater and surface water resources. Several examples highlight this issue:

- First, the State Water Resources Control Board regulates surface water rights dating from 1914, but not rights dating before 1914;
- If that's not confusing enough, the State Board also regulates groundwater quality, but not the rights to use groundwater;
- On a local level, county groundwater ordinances and local agency groundwater management plans often only apply to a portion of the groundwater basin, and those with overlapping boundaries of responsibility do not necessarily have consistent management objectives; and finally,
- Except in adjudicated basins, individuals have few restrictions on how much groundwater they can use, provided the water is put to beneficial use on the overlying property.

As you can see, failure to integrate water management across jurisdictions makes it difficult to manage water for multiple benefits and provide for sustainable use, including the ability to identify and protect or mitigate potential impacts to third parties, ensure protection of legal rights of water users, establish rights to use vacant aquifer space and banked water, protect the environment, recognize and protect groundwater recharge and discharge areas, and protect public trust resources.

Water Quality – Groundwater quality can be degraded by naturally occurring or human introduced chemical constituents, low quality recharge water, or chemical reactions caused by mixing water of differing qualities. Protection of human health, the environment, and groundwater quality are all concerns for programs that recharge urban runoff or reclaimed/recycled water. The intended end use of the water can also influence the implementation of conjunctive management projects. For example, agriculture can generally use water of lower quality than needed for urban use, but certain crops can be sensitive to some constituents like boron.

New and changing water quality standards and emerging contaminants add uncertainty to implementing conjunctive management projects. A water source may, at the time it is used for recharge, meet all drinking water quality standards. Over time, however, detection capabilities improve and new or changed water quality standards become applicable. As a result, contaminants that were not previously identified or detected may become future water quality problems creating potential liability uncertainties. In some cases, conjunctive water management activities may need to be coordinated with groundwater clean up activities to achieve multiple benefits to both water supply and groundwater quality.

Myriad water quality regulations and public perception must be overcome to make the most effective use of source supplies for groundwater recharge. Proposals to recharge high quality treated wastewater have failed in many localities due to public outcry. The Orange County Water District project referenced above is an example where public outreach and education has overcome this obstacle. In other instances, conflict between drinking water and water quality protection regulations have made it difficult to recharge an aquifer with water that has been treated to meet all drinking water quality standards.

Environmental Concerns – Environmental concerns related to conjunctive management projects include potential impacts on habitat, water quality, and wildlife caused by shifting or increasing patterns of groundwater and surface water use. For example, floodwaters are typically considered "available" for recharge. However, flood flows serve an important function in the ecosystem. Removing or reducing these peak flows can negatively impact the ecosystem. A key challenge is to balance the in-stream flow and other environmental needs with the water supply aspects of conjunctive management projects. There may also be impacts from construction and operation of groundwater recharge basins and new conveyance facilities.

Funding – There is generally limited funding to develop the infrastructure and monitoring capability for conjunctive management projects. This includes funding to develop and implement groundwater management plans, to study and construct conjunctive management projects, and to track – statewide and regionally – changes in groundwater levels, groundwater flows, groundwater quality – including the location and spreading of contaminant plumes – land subsidence, changes in surface water flow, surface water quality, and the interaction and interrelated nature of surface water and groundwater.

Grant applications from DWR's Conjunctive Water Management Program show costs ranging from $10 to $600 per acre-foot of additional water delivered. This wide range of

costs is due to many factors, including project complexity, regional differences in construction and land costs, availability and quality of recharge supply, availability of infrastructure to capture, convey, recharge, and extract water, intended use of water, and treatment requirements. In general, urban uses can support higher project costs than agricultural uses.

The state and local investment in these projects of approximately $1 billion to attain 300,000 acre-feet of additional water, would translate to $1.7 billion for the conservative level of implementation and nearly $7 billion for the aggressive implementation.

Recommendations

California Water Plan Update 2005 is the product of a collaborative process that brought together the Department of Water Resources, a 65-member advisory committee representing urban, agricultural, and environmental interests, a 350-member extended review forum, and 2,000 interested members of the public. The result is a plan that includes the very best ideas for meeting our water challenges, and the following recommendations about conjunctive water management:

1. Local water management agencies should coordinate with other agencies that are involved in activities that might affect long term sustainability of water supply and water quality within or adjacent to a groundwater basin. Such regional coordination will take different forms in each area because of dissimilar political, legal, institutional, technical, and economic constraints and opportunities, but will likely include agencies with authority over managing groundwater and surface water quantity and quality, land use planning, human health, and environmental protection. Regional groundwater management plans should be developed with assistance from an advisory committee of stakeholders to help guide the development, educational outreach, and implementation of the plans.

2. Continue funding for local groundwater monitoring and management activities and feasibility studies that enhance the coordinated use of groundwater and surface water. Additional monitoring and analysis is needed to track, both statewide and regionally, changes in groundwater levels, groundwater flows, groundwater quality (including the location and spreading of contaminant plumes), land subsidence, changes in surface water flow, surface water quality, and the interaction and interrelated nature of surface water and groundwater. There is a need to develop comprehensive data and data management systems to track existing, proposed, and potential conjunctive management projects throughout the state and identify and evaluate regional and statewide implementation constraints, including availability of water to recharge, ability to

convey water from source to destination, water quality issues, environmental issues, and costs and benefits.

3. Give priority for funding and technical assistance to conjunctive management projects that are conducted in accordance with a groundwater management plan, increase water supplies, and have other benefits including the sustainable use of groundwater, maintaining or improving water quality, and enhancing the environment. Additional preference should be given for projects conducted in accordance with a basinwide groundwater management plan. In addition, allow funding for projects that make use of wet season/dry season supply variability, not just wet-year/dry-year variability.

4. Assess groundwater management to provide an understanding of how local agencies are implementing actions to use and protect groundwater, an understanding of which actions are working at the local level and which are not working, and how state programs can be improved to help agencies prepare effective groundwater management plans.

5. Improve coordination and cooperation among local, state, and federal agencies with differing responsibilities for groundwater and surface water management and monitoring to facilitate conjunctive management, to ensure efficient use of resources, to provide timely regulatory approvals, to prevent conflicting rules or guidelines, and to promote easy access to information by the public.

6. Encourage local groundwater management authorities to manage the use of vacant aquifer space for artificial recharge and to develop multi-benefit projects that generate source water for groundwater storage by capturing water that would otherwise not be used by other water users or the environment. For example, through reservoir re-operation, water recycling and reuse, and water conservation.

7. Include wildlife agencies in the loop to streamline the environmental permitting process for the development of conjunctive management facilities, like recharge basins, when they are designed with pre-defined benefits or mitigation to wildlife and wildlife habitat.

Mr. ISSA. Thank you.

Once again, all of your statements will be in the record. I do appreciate it when you are able to add to the base text.

Tony, it is all yours. Everyone has been so good. There is high hurdle here.

STATEMENT OF ANTHONY J. PACK

Mr. PACK. Mr. Chairman, you believe how much I've struggled to get this thing down to 5 minutes, and I'm glad it's in the record.

My name is Tony Pack, and I'm the general manager of Eastern Municipal Water District. On behalf of my organization and my board of directors, it's a real privilege to be here to present this testimony on a local agency's perspective on conjunctive water management and the potential participation of the Federal and State government.

EMWD provides water, waste water, and recycled services for about 580,000 people in Western Riverside County in southern California, including parts of the chairman's district, one of the fastest-growing regions in the Nation.

EMWD relies on imported water to meet 65 percent of its needs and supplements the remainder with recycled water, ground water wells, two desalters, a fledgling conjunctive use program, and additional supplies, which have been developed almost entirely through the development of locally funded and managed projects.

Based on our experience with the development of new water through conjunctive use and our efforts to develop a ground water management plan with the local agencies, we would suggest several recommendations in the area of partnership, funding, and environmental areas.

An essential element of the development of a conjunctive water management program is the administrative and operational procedures that are necessary to develop and maintain such an agreement. These rules can be established through a court order adjudication, which requires many years of expensive legal efforts, or a cooperative community effort.

In our area, the two cities, the two water agencies, and the private well users voluntarily began the process to develop a ground water management plan to permit a major conjunctive use project to be implemented and also to resolve a longstanding Indian water rights claim.

It was necessary to overcome years of perceptions, mutual distrust and suspicion, and parochialism. And this was only possible through the efforts of Mr. Grindstaff's Department of Water Resources, which provided an independent facilitator and a technical team of DWR employees and consultants that created a nonconfrontational and credible forum for discussion and validation of data.

First recommendation. Encourage programs similar to DWR's local agency partnership program throughout the Western States and create a similar program within the Federal agencies, perhaps under the auspices of the Bureau of Reclamation.

Recommendation. Except for very large projects that provide a State-wide benefit, design and implementation of conjunctive use projects should be under local control.

The infrastructure costs of implementing a conjunctive use program can be beyond the reach of many agencies. One solution is to develop financing for storage projects through a cooperative cost-sharing agreement with other agencies that recognize the multiple benefits of the project.

Recommendation. Where multiple benefits can be incorporated, work with other local agencies to share the costs.

Serving rapidly growing areas like ours requires enormous capital to provide water and waste water infrastructure. In many cases, it is more efficient and economical to oversize those facilities, although it may take many years to recoup that financial investment.

Faced with limited financial resources, agencies are forced to use available cash to satisfy immediate needs for infrastructure, and beneficial projects such as new sources of water supply which do not always rise to the top of the priority list.

Recommendation. State and Federal assistance for loans and grant programs for the development of new water supplies must continue to be funded. The economic returns of these programs far exceed the investments.

EMWD has developed a highly structured and successful process for securing loans and grants to partially finance resource projects. Not all agencies have the resources to pursue State and Federal financial assistance programs. And therefore, we recommend the development of less costly and cumbersome application processes or, at a minimum, provide assistance to those agencies lacking resources to apply for loans and grants both at the Federal and State level.

The last area is the area of environmental. Environmental permitting processes and the local coordination between Federal agencies is, in many cases, the major challenge in the development of a conjunctive use program. EMWD has spent the past 5 years and $1.8 million in an attempt to obtain a permit for an expanded recharge program in the San Jacinto riverbed.

The proposed approval after 5 years from Fish and Wildlife Service is completely unworkable and will cause the project to be terminated. A chronology of our environmental activities and permitting attempts was provided in my written testimony.

Common threads in this history are a lack of technical knowledge on the part of the agency's staffs, frequent changes in staff contacts, continuous requests for more documents and information, delays and missed deadlines, and, most annoying, a lack of response in just simple communications like a return telephone call or an e-mail.

Our recommendation is to create regional interagency task forces of Federal agencies, such as the EPA, the Corps of Engineers, Fish and Wildlife, and the Bureau that would meet on a quarterly basis to provide for regional coordination of projects where multiple Federal agencies are involved. Agency decisionmakers would be required to attend, and project proponents would have an opportunity to bring up their concerns and issues.

And the last recommendation is ESA reform is currently being discussed in the Congress and is desperately needed. ESA reform needs to move forward.

I thank you and your subcommittee for allowing me, on behalf of my board of directors, to provide this testimony, and I'll now respond to your questions.

[The prepared statement of Mr. Pack follows:]

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March 30, 2006

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United States House of Representatives
B-349-C Rayburn House Office Building
Washington, D.C. 20515-6143

RE: Conjunctive Water Management (April 5, 2006)

Dear Chairman Issa:

The Eastern Municipal Water District (EMWD) appreciates the opportunity to provide verbal testimony to the Committee as it reviews the important role of conjunctive use as a key tool in developing future water supplies in the west.

The attached document presents our thoughts on the challenges, and benefits of such a program and the role that federal and state governments should play in the development of such programs.

Sincerely,

Anthony J. Pack
General Manager

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Written Testimony

Conjunctive Water Management: A Solution to the West's Growing Water Demand

Submitted to:
Honorable Darrell Issa
Chairman

Subcommittee on Energy and Resources
Committee on Government Reform
House of Representatives

Presented by:
Mr. Anthony J. Pack
General Manager
Eastern Municipal Water District

April 5, 2006

Chairman and Members of the Committee:

My name is Anthony J. Pack and I am the General Manager of the Eastern Municipal Water District (EMWD or the District). On behalf of EMWD and its Board of Directors, it is my privilege to present this testimony on one agency's experience in Conjunctive Water Management and the potential participation of the state and federal government in such a program.

EMWD provides domestic water, recycled water, and sanitation services for about 580,000 people in a service area of over 555 square miles in Western Riverside County in Southern California, one of the fastest growing areas in the nation. EMWD relies on water supply from the State and Federal water projects such as the State Water Project and the Colorado River to meet 65% of its needs, and supplements the remainder with recycled water, groundwater, and desalted brackish groundwater; supplies which have been generated primarily through the development of locally funded and managed projects. Recognizing the limited future availability of water from the existing sources, and the need to meet the ever increasing demands of up to 1,000 new connections each month, EMWD has ventured into an aggressive expansion of its water reuse program, and an extensive brackish groundwater desalination program coupled with an integrated groundwater management strategy.

Conjunctive use, defined as the coordinated and planned management of surface and groundwater supplies to maximize the efficient use of the resource, has been practiced for decades in California and is the most efficient and environmentally benign method of storing water in wet years for use in periods of lower precipitation. The underground aquifers throughout California currently hold in excess of 850 million acre-feet of water, nearly 20 times the amount of water that can be stored in all of the state's dams and supplies approximately 30 percent of the state's urban and agricultural water need. I'll not dwell on the statewide issues with such an expert as the Director of the Bay Delta Authority, Joe Grindstaff, also testifying before your Committee and will discuss my own agency's experience and perspective.

Conjunctive use can be applied in several ways. The most common method uses artificial recharge by placing the water directly into the aquifers through percolation and/or injection. Percolation can be enhanced by creating spreading basins atop the aquifers in areas that have high rates of absorption. Another method, in-lieu recharge, works on the idea of reducing the amount of water pumped from the aquifer by providing excess surface water supplies or recycled water when available. Eastern Municipal Water District (EMWD) has used both methods successfully; I'll discuss our in-lieu programs first.

As one of the largest reclaimers of wastewater in the state, we have provided recycled water to golf courses, wildlife refuges, schools, sod farms and a myriad of other agricultural and municipal irrigators who had previously used groundwater wells. In return for a discounted cost, the user agrees to discontinue groundwater pumping and receives, in many cases, more reliable and better quality water. The water that would have been pumped remains in the aquifer. These programs have saved hundreds of thousands of acre-feet of groundwater that can be used for municipal drinking water. We are also completing construction of an untreated water distribution system to provide raw imported water to a number of dairies for use in wash down of the animals that was previously done with well water.

Groundwater is recharged in several areas in the EMWD service area, but the largest operation is located in the San Jacinto (dry) Riverbed along the eastern edge of EMWD's service area. Here two cities and two water agencies as well as a number of private farmers compete for a limited amount of groundwater in a severely over drafted basin. Until recently, groundwater was the only source of drinking water for over 125,000 residents in this community. EMWD has invested several million dollars in system improvements to allow a limited amount of imported water to be brought into the basin and is currently completing a $42 Million water treatment plant that will meet a portion of the demand, but at a much higher cost to the users than local groundwater.

EMWD has been recharging small amounts of untreated northern California water in the river since 1990, averaging about 3,000 acre-feet per year. In the last several years, the four entities have joined together to fund imports of 6,000 to 8,000 acre-feet per year, which is the limit of the capacity of small, currently permitted, five acre recharge site. Faced with continuing over-drafting and declining groundwater levels, EMWD initiated design of a project in 2000 to import substantial amounts of water during the wet months to satisfy four key objectives:

1. Permit the recharge of an average of up to 7,500 acre-feet of imported water during a six-month period as part of a settlement of a 70-year-old Indian water rights lawsuit.

2. Provide for recharge to remedy the estimated 10,000 to 18,000 acre-foot overdraft.

3. Provide for recharge to address the future needs of the area.

4. Provide facilities to enter into an agreement with the Metropolitan Water District of Southern California for a conjunctive use program of up to 45,000 acre-foot to partially drought proof the region.

The future project costs are currently estimated at $50 Million, over and above the $10 Million previously invested in infrastructure, with the first phase estimated at $16 million.

In 2001, the District initiated environmental document preparation with the federal Fish and Wildlife Service (FWS or the Service) as the lead agency. After several years without any progress, in March 2004, the District requested the U. S. Army Corps of Engineers (USCOE) to take the lead on a Clean Water Act 404 permit with a Section 7 consultation with the FWS. After months of delay, changes in project managers at the Corps, additional requirements for documentation, and development and analysis of sixteen different alternatives, the USCOE Statement of Purpose and Need was developed, and the public scoping meeting was held in March 2005. The USCOE, finally initiated the Section 7 consultation with the FWS in August of 2005, after additional documents were requested and produced by the District. The mandated 135-day time period ended in early January 2006; however, no communication was received from FWS until two weeks ago when the Service provided a brief e-mail proposal (without backup documentation) for a much smaller project. The draft proposal reflected a gross misunderstanding of the EMWD project in spite of the months of responding to requests for information and the delivery of hundreds of pages of documents. The current draft proposal offered by FWS is completely unacceptable and will not meet any of the objectives listed above. We have initiated negotiations with the Service and will base our argument on what we perceive as basic errors in their draft proposal. If these negotiations do not result in a more feasible and economically justifiable decision, we will walk away from this project having spent more than five years and $1.84 Million in District expenses; EMWD will forfeit a

$5 Million grant for construction from the State; and twelve years of negotiations over a Tribal Water Rights Settlement will have been wasted. The community will continue to be at risk, with their primary water supply dependent on an over drafted groundwater basin, and future development will be placed on hold until expensive facilities are constructed to treat imported water, if available. In addition, the negotiations on the Indian Water Rights claims have to be completely revised. A detailed chronology is provided as Attachment One.

With our experience with this project and our efforts to develop a Groundwater Management Plan (GMP) in this area, we would suggest several recommendations on how government at each level can work together to advance conjunctive water management.

PARTNERSHIP

An essential element in the development of a conjunctive water management program is the administrative and operational procedures that will govern the development of the facilities, the purchase and conveyance of recharge water, extraction limits for each participant, and financing of future water purchases, to mention a few. These rules can be established through a legal process called adjudication, which requires many years of expensive, legal efforts. In our area the two cities, the two water agencies, and the private well users voluntarily began the process to develop a Groundwater Management Plan and resolve the Indian Water Rights claim via a negotiated judicial action. It was necessary to overcome years of bad relationships, mutual distrust and suspicion, and parochialism. This was only possible through the efforts of the California Department of Water Resources (DWR), which provided an independent facilitator, and technical team of DWR employees and consultants that created an unbiased and credible forum for discussion and validation of data.

First Recommendation: Encourage programs similar to DWR's Local Agency Partnership Program throughout the Western states and create a similar program within the federal agencies, perhaps under the auspices of the Bureau of Reclamation (BUREC).

Second Recommendation: Except for very large projects that provide a statewide benefit, design and implementation of conjunctive use projects should be under local control.

The infrastructure costs of implementing a conjunctive use program can be beyond the reach of many agencies. One solution is to develop financing for storage projects through a cooperative cost sharing agreement that recognizes the benefits from the projects for flood control, recreation and environmental restoration, water supply and water quality improvements. As an example, EMWD developed a project with the County Flood Control District to capture flows from a major flood control channel and divert them to a large percolation basin for recharge rather than channeling the flows to the river as originally planned. Both agencies received benefits and both agencies shared the costs.

Recommendation: Where multiple benefits can be incorporated, work with other local agencies to share costs.

FUNDING

Serving rapidly growing areas like EMWD requires tremendous capital to provide the water and wastewater infrastructure driven by the residential and commercial development. In many cases, it is more efficient and economical to oversize the facilities although the customer growth may require several years to pay for the facility. Faced with limited financial resources, the agencies are forced to use available cash to satisfy immediate needs for infrastructure, and beneficial projects such as new sources of water supply do not always rise to the top of the priority list. With very limited new supplies of water from surface flows and storage, desalination, conservation, recycled water and conjunctive use are the only means to generate these new sources of water.

Recommendation: State and federal assistance for loans and grant programs for the development of new water supplies must continue to be funded. The economic returns of these programs far exceed the investments.

EMWD has developed a highly structured process for securing loans and grants to partially finance community projects like those that have been described in this testimony. Not all agencies have the resources to pursue state and federal financial assistance programs.

Recommendation: Develop less costly and cumbersome application and processes or, at a minimum, provide assistance to those agencies lacking resources to apply for loans and grants, both at a federal and state level.

ENVIRONMENTAL

The environmental permitting process both on the national level with the Endangered Species Act (ESA) and the local coordination between federal agencies is the major challenge in the development of a conjunctive use program. The most efficient and economical method of recharge is by spreading water in surface ponds where the soils permit a high level of percolation. In California and much of the West these are also prime habitat lands for endangered species. While the District recognizes the importance of these species and the protection offered under the ESA, there seems to be a complete lack of cooperation, willingness to compromise, and openness on the part of the agency staffs. A chronology of our environmental activities and permitting attempts since 2001 is attached. Common trends in this process are a lack of technical knowledge on the part of the agency staffs, frequent changes in staff contacts, continuous requests for more documents and information, delays and missed deadlines, and most annoying, a lack of response in just simple communications like a returned call or an answered email.

First Recommendation: Create regional, interagency task forces of Federal agencies such as EPA, USCOE, FWS, and Bureau of Reclamation, etc, that would meet on a quarterly basis to provide for regional coordination of projects where multiple federal agencies are involved. Agency decision makers would be required to attend and project proponents would have an opportunity to bring up their concerns and issues.

Second Recommendation: ESA reform is currently being discussed in Congress and is desperately needed. ESA reform needs to move forward.

We strongly believe that the successful implementation of conjunctive water management programs will create new water sources that will relieve the demand on the existing water projects for other State and national critical needs. This would not be feasible without the leadership and the financial participation of the Federal and State agencies and the desire of EMWD's Board of Directors to diligently invest local funds on innovative water projects.

I thank you and your esteemed committee for allowing me, on behalf of my Board, to provide this testimony.

ATTACHMENT ONE

BACKGROUND PAPER
EASTERN MUNICIPAL WATER DISTIRICT'S
INTEGRATED RECHARGE AND RECOVERY PROJECT

SUMMARY
Eastern Municipal Water District (EMWD) is proposing to construct up to 100 acres of recharge basins in the San Jacinto River along with associated delivery and extraction facilities. The purpose of the project is to eliminate groundwater overdraft; increase reliability by storing water for use during drought years; meet the water supply needs of the Soboba Indian Tribe as enumerated in the proposed Settlement Agreement; and meet critical water resource needs of the Hemet/San Jacinto valley for the future. The project is subject to federal and state permits relating to Waters of the U.S. and the Endangered Species Act (ESA).

DISCUSSION
The project was submitted to the State for consideration of grant funding in 2003. The project was ranked third out of 43 applications during the evaluation process and received notice of a $4,397,750 grant approval in December of 2003, which was later increased to $5,000,000. Current State directives call for environmental permitting to be complete by January 2007.

EMWD and its predecessor agencies (Fruitvale Mutual, et al) have conducted water recharge and extraction activities in the river since the early 1900s. Groundwater replenishment is critical for the longevity of these resources as a water supply for the Cities of Hemet and San Jacinto.

The San Jacinto River is now home to some endangered and sensitive species, the most significant of which is the San Bernardino Kangaroo Rat.

EMWD has been communicating the need for this project to federal agencies since March 2001 in conjunction with negotiations regarding the Soboba water rights settlement, which have been underway since 1995.

In May 2001, an approach was agreed to by the Corps of Engineers (Corps) and U.S. Fish and Wildlife Service (FWS or Service) that included FWS as federal lead agency for a joint EIR/EIS and an ESA Section 10 permit for a Habitat Conservation Plan covering all recharge operations in the river, including the proposed project. This would have been a long term solution to not only water recharge, but the protection of the state and federally listed species in the river. However, due to the staffing requirement of the Riverside County Multi-Species Habitat Conservation Plan, FWS was unable to live up to their commitment. We were essentially put off for two and one-half years.

In March 2004, an alternative approach was suggested by the Corps, for the Corps to be the lead agency on a Clean Water Act 404 permit with Section 7 consultation with FWS, and addressing National Environmental Policy Act (NEPA) compliance through an Environmental Assessment (EA). In May 2004, an application for the 404 Permit and draft EA was submitted by EMWD to the Corps.

At a new project kick-off meeting in July 2004 with the FWS and the Corps, EMWD was informed by a new Corps Project Manager, that an Environmental Impact Statement would be required for NEPA compliance. In August 2004, the California Environmental Quality Act process and project design were completed.

After a site visit and subsequent discussion with the Corps, EMWD agreed to the EIS in order to facilitate moving the project ahead. An extension was twice requested from, and granted by the state, to delay completion of the project environmental permitting from December 2004 to the current date of January 2007.

At a meeting on November 17, 2004, at the Los Angeles District office of the Corps with the Corps project manager, a schedule was agreed upon which called for initiation of Public Scoping in the Federal Register on or about January 14, 2005. An agency meeting with FWS, EPA, Soboba Tribe, Bureau of Reclamation, and State Fish and Game to decide project alternatives and the Corps' Statement of Purpose and Need was proposed for January 18. A public scoping meeting was planned for February 1. Due to other Corps workload, the Federal Register announcement and agency meeting were delayed until March 2.

At the March 2 agency meeting, EMWD was directed by the Corps and FWS to develop an additional project alternative addressing out-of-river recharge to the maximum extent possible. In addition, the Corps project manager promised to draft the federal Statement of Purpose and Need by the following week. The public scoping meeting was held on March 8, with no public attendance.

After several subsequent meetings with the FWS and Commander of the Corps' Los Angeles District, we finally received the federal Statement of Purpose and Need on June 28. On July 13 we were informed that the Corps now needed a 404b(1) alternatives analysis and Biological Assessment to initiate formal Section 7 consultation. (ESA requires neither.) These were delivered on July 24 and 31.

Formal Section 7 consultation with the U.S. Fish and Wildlife Service was initiated by the Corps on August 22, 2005. The 135-day consultation and report period was to end on January 7, 2006 with the issuance of the Biological Opinion by the Service. Helix Environmental Planning, the Corps' Environmental Impact Statement (EIS) consultant submitted a Biological Assessment (BA) for the project to both the Corps and Service on August 25. The BA detailed background and impacts to biological resources in the project area. It also outlined our mitigation proposals.

On October 10 the Service, along with the Corps, received a tour of the project area focusing on the proposed mitigation areas, to aid in their analysis. On that date the Corps was also given the first screen-check draft of the EIS for their internal review.

On December 6, the Corps received a letter from the Service requesting a 60-day extension (to March 8, 2006) of the Section 7 consultation period, justified based on the complexity of the project. The Corps never responded formally to that letter.

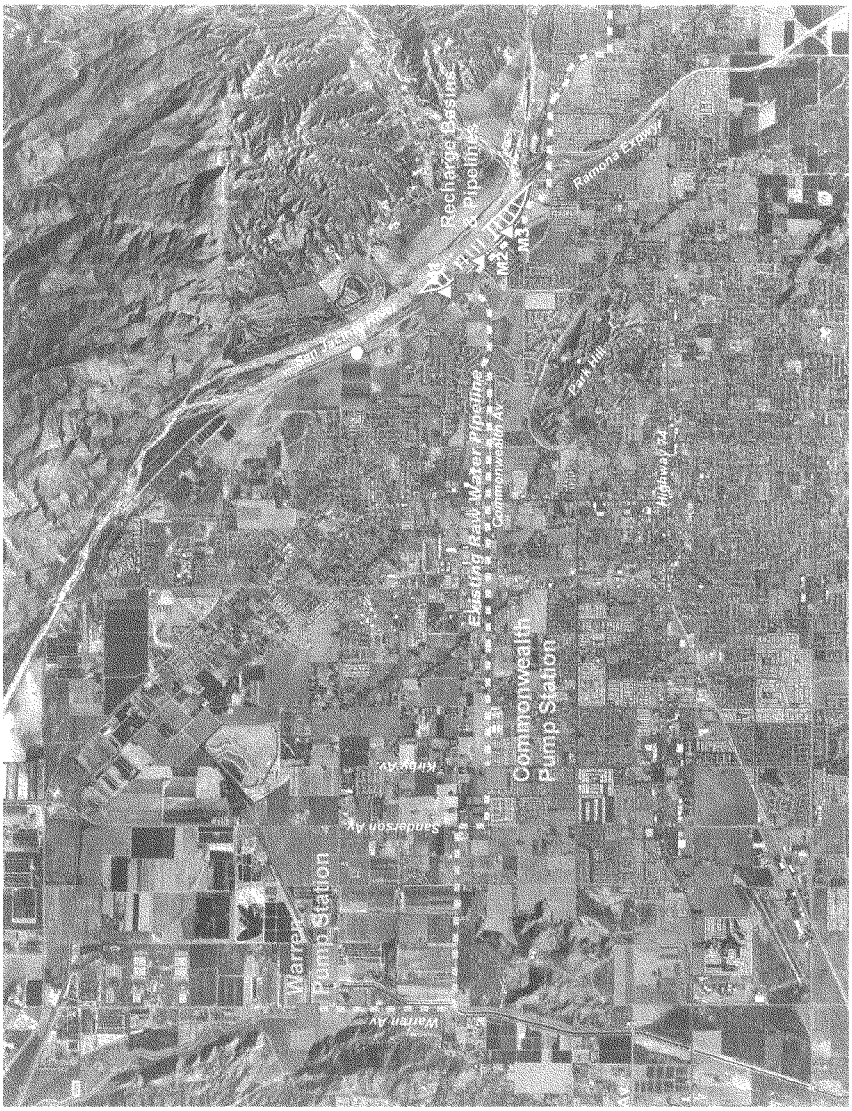
In January 2006, the Corps assigned a new project manager due to the transfer of the previous staff member and on January 10, 2006, after 90 days, the Corps finally returned their comments on the draft EIS. On January 12 a site visit took place to orient the new project manager as well as a representative from EPA. During the visit, EMWD and Helix requested that the Corps set a meeting with the Service as soon as possible to get a decision on whether or not the Service would be rendering a "jeopardy"

decision. Our concern was that the Service's proposed alternative would differ from those covered in the EIS and further exacerbate the delays in that schedule.

On February 15 a conference call was held in lieu of the meeting, however the Service was still not able to communicate a decision. They requested copies of the screen-check draft EIS, which they were subsequently sent.

On March 7, we received a telephone call from the Corps project manager stated that the Service had advised him they were seriously considering a jeopardy decision and requested we delay the release of the draft EIS. After discussion with the Corps, it was mutually decided not to grant the Service's request for a delay.

On March 27, we received an e-mail from the Corps relaying the Service's proposal for an alternative of 17.1 acres of recharge area and 1.4 acres for wells. Our response to that proposal was transmitted to the Corps on March 30 for their review and submittal to the Service.


Warren
Pump Station
Warren Av
Kirby Av
Sanderson Av
Existing Raw Water Pipeline
Commonwealth Av
Commonwealth
Pump Station
Recharge Basins
& Pipelines
M2
M3
Ramona Expwy
Dawn Hill
Highway 72
San Jacinto River

Mr. ISSA. Thank you.

Mr. Pack, I think I will come right back to you. I actually have a very good memory. It is just short, so I will start with you first.

Jason, just because that rings a bell, don't get too attached to it.

I, too, am very disappointed in the lack of accountability and the lack of performance by sort of this combination of the Corps of Engineers and Fish and Wildlife, and I think you touched on it very well. But when you talked about having a task force, if I understood correctly—and I am not trying to put words in your mouth.

But I mean, the failure that we have now is strictly the absence of accountability, absence of a mandate either to the Corps or to Fish and Wildlife. If I understand correctly, what you would like to see is one individual or accountable agency that would be responsible for timelines and, in fact, for the completeness of a request rather than, as I understand it, an infinite amount of, if you answer a question, then 6 months later, they come up with a new one.

I know I am putting a lot in, but is that pretty much what you are trying to avoid?

Mr. PACK. That may be one way to accomplish that, sir. But one of the agencies is usually the lead in the environmental permitting process. We started out with Fish and Wildlife. After about 3 years without any progress, based on a recommendation, the Corps of Engineers took over as lead under a 404 permit.

The problem is that even the agencies, in our case, the Corps had identified our project as their No. 1 priority and communicated that to the Fish and Wildlife. Fish and Wildlife never responded even to the head of the regional Corps office, and much less to me.

So I think there's—they all need to be in a room, and they need to be the principal decisionmakers, not the staff. We need to be able to have a forum somewhere with all the participating agencies that we can bring these issues up, and we can discuss where we haven't made progress.

Mr. ISSA. I want to be very clear on this point because throughout my district and my experience, that has been one of the problems, Fish and Wildlife more than the Corps.

But the bottom line is that you don't get to the decisionmaker normally. Even when you ask for a meeting, the person they send is the person who is going to get back to you. And when they do get back to you, it is someone saying no or coming up with a creative new answer.

If I understand correctly, you are calling for as often as quarterly meetings that would include the decisionmakers to make sure that, in fact, the project stayed on schedule? Is that roughly what you would like to see?

Mr. PACK. That's a proposal. It doesn't necessarily have to be quarterly, but it has to be frequently. And in our case, we're trying to meet our own obligations to the State of California for a $5 million grant that we've been awarded for this project. And we've had to extend the timing of that grant twice because of the failure to obtain the permits.

Mr. ISSA. I would be remiss if, as a Californian, I didn't ask you to contrast Fish and Wildlife versus Fish and Game. [Laughter.]

Mr. PACK. Actually——

Mr. ISSA. Sorry, Tony. No easy questions here.

Mr. PACK. No. Fish and Game sometimes is difficult to deal with, but I have access to the people there, and I have my phone calls returned.

In fact, we're working—we have, for many years, provided recycled water to the San Jacinto Wildlife Refuge, and we are expanding that project four times to provide additional water storage for us. The cooperation in that particular project from Fish and Game has been good.

Mr. ISSA. Excellent.

Mr. Peltier, Mr. Kucinich alluded to taking water from a fifth of the water on the face of the Earth, which lies in the Great Lakes. Is that something you are aware of impending?

Mr. PELTIER. No, sir.

Mr. ISSA. OK. I am just checking. I won't ask you to elaborate.

Mr. PELTIER. I won't even joke about it.

Mr. ISSA. OK. Fair enough.

Dennis and I, by the way, are both native Clevelanders, so I just had to get that one in for my mom.

However, I would like to ask each of you to comment, because we have talked about California, and we will continue to stay on it mostly. But I think, particularly from Mr. Peltier, Florida.

One of our members of this subcommittee who isn't here because she has her own chair that she is presently in—Florida is a place that has a lowering water table and the intrusion of salt water. How do you view conjunctive use relative to regions outside California and Florida, as an example, if you can include it?

Mr. PELTIER. The most relevant thing I can bring to the table in the situations in Florida is that is a great place for the U.S. Geological Survey to deploy its scientific resources to inform the decisionmakers.

We don't have a water management—Interior doesn't have a water management role, per se. But the science behind making conjunctive use work in holding back sea water and so forth is essential to make sure that any investment is, indeed, a wise investment. And——

Mr. ISSA. Please.

Mr. PELTIER [continuing]. Might I comment on Tony's concerns? Nobody will give me permission to talk on behalf of the Fish and Wildlife Service, so I'm a little bit limited in responding to him in that regard.

But I did, when I got an advance copy of his testimony, read it and provided it to Fish and Wildlife Service management and had discussion with them about it. So one—one accomplishment has already occurred, which is getting on the screen of management that we got a problem—or they have a problem here.

I will be pleased to continue to try and facilitate some dialog and discussion between Tony and the service because any citizen can listen to him and say that doesn't sound like the way we want government to work. I don't know all the facts and details, but—so I don't want to dis the Fish and Wildlife Service, but I'll try to see what I can do to help.

Mr. ISSA. Well, I certainly appreciate it. The Fish and Wildlife obviously has an important role. This committee and other commit-

tees in the Congress rely heavily on their providing real protection for not just fish and wildlife, but, in fact, for endangered and potentially endangered species and a maintenance of a lifestyle that American people count on us for. I also don't want to throw them under the bus unnecessarily.

However, when we look at the availability of both surface and ground water, it is one of those areas in which we are supposed to be on the same side. We are supposed to agree to the beneficial effects. Often, we agree to it in principle, and in the case of another project that I have in another part of my district, you end up with a water project that, in fact, is now breeding birds, which is fine, except it is supposed to be a levee to prevent flooding. So we often find some very unintended consequences.

To that extent, and maybe perhaps beyond Fish and Wildlife for a moment, are there Federal actions, policies, or regulations that inhibit or deter local adoption of conjunctive water management? I could probably look at each of you, and from three different places on the totem pole, you could answer that.

Mr. PELTIER. Sure. There are a suite of environmental laws and regulations that are designed to make sure that if people want to propose an infrastructure development, a project, that the values and goals of the Clean Water Act, the Endangered Species Act, etc., are taken into account and accounted for. And then some of those could have an inhibiting impact.

There is, however, also a great desire within Reclamation and in the GS to partner up with folks and make progress because the challenges associated with limited water supply have the potential for great economic impact. It's the kind of the mission of the agencies to be a helpful partner. So there's a little of both there, I would say.

Mr. ISSA. Well, of course, for Interior, if you are going to—speaking as a Californian—if you are going to play Solomon with the Colorado River water allocation, we definitely think we ought to all be working together.

Joseph.

Mr. GRINDSTAFF. Yes, I want to agree with a lot of what both my co-panelists have said.

Mr. ISSA. By the way, this is not one of those in which controversy is required. It often occurs, but we actually don't demand it as a condition of your being on the panel.

Mr. GRINDSTAFF. Oh, good. Good, because I don't think this will be controversial, although my most recent assignment in the last few months has been CALFED. And CALFED was built on, first, trying to get agencies to work together.

And for those that don't know, 15 years ago, California Delta was dysfunctional because the agencies couldn't get together and couldn't develop a plan. We have in fact, developed a plan that hasn't been perfectly successful, but we do have people talking to one another and have a process that I think over time, with probably lots of money, will make a real difference.

I very much support the suggestion by Tony that it's important to have decisionmakers come together and discuss issues because, in the end, we all have to balance the different responsibilities that are out there. And you can't do that by just saying, "Here's a rule,

and here's a rule." If we followed all of the rules, many—you would find that many of them conflict.

It is the responsibility of administrators, at least at a high level, to try and see how do we live within the rules, but also accomplish the major objective that we have, which is to make this a better place for our citizens to live.

Mr. ISSA. Thank you.

Mr. PACK. A couple of points, and I want to acknowledge, Jason, that the local head of the Fish and Wildlife did contact me. I had informed him that I was going to testify and told him basically what I intended to say. And also the regional director received a copy of the testimony ahead of time.

And we're proposing now, the three of us, to get together and see if we can work out some kind of mutual solution to this issue.

On the issue of Federal regulations, I'm a little puzzled why we start with the same Federal/Nation-wide regulations, and they end up so differently interpreted in different places. Jason, you mentioned Florida. I was lucky to live in St. Petersburg for several years while I was stationed with the U.S. Central Command, and we had in my development, we all used recycled water for landscaping for our entire yard.

This was in the mid 1980's, and there never was any issue at all. And of course, recycled water did percolate into the ground and became a major source of natural recharge.

In California, California has been very slow to move to tertiary—to use of recycled water for residential irrigation. They're just beginning. There's been a couple of projects completed, and we have two projects in my district underway right now.

I think California has been a little more conservative in interpreting the same rules and regulations. And even we see that on the State and local—between the State—between the local regional water quality control boards. There's a vast difference in the way that they interpret and the way they work with the agencies, just between two regional boards.

Mr. ISSA. Tony, if you could, for the record, give a rough ratio in California, because we are an interesting place, from the standpoint of our use outside the home versus inside the home, in those communities that already have it, what the quantity of this not potable water consumption is versus the interior drinkable water, wash your clothes and your dishes with it water?

How big a part of the equation that can be if we were to move to dividing our water throughout California?

Mr. PACK. I'm not sure I understood your question, but 40 to 50 percent of all water use is used outside the home is for irrigation. In the State of California, virtually none of that on a residential basis is recycled water.

On large landscapes, we've been very aggressive in moving ahead with recycled water use, and we're now the fourth-largest user of recycled water in the State of California, following only Los Angeles, Orange County, and large cities.

Mr. ISSA. All right, and I want to commend you for that.

The reason I asked the question, as confusing as it might have been, is that we are dealing with 40 to 50 percent of the water that

we presently go through additional treatment, chlorinate, deal with lines that have to be maintained and kept clean.

Concerns about lead, arsenic, all kinds of other substances, even in microscope amounts—or parts per billion amounts—on twice as much water as we would if, in fact, California over a period of time adopted a two water supply use. Then that would be fair to say?

Mr. PACK. Yes, sir.

Mr. ISSA. You can tell I am not only thrilled with what you are doing in Riverside County, but I am hoping that California sees that as a way to dramatically reduce the amount of chemicals and cost that we put into our water supply.

One thing that I don't think we have touched on was the role of conjunctive use in habitat projects. We talked about Fish and Wildlife and Fish and Game. But where do you see the potentials or do you see potentials where conjunctive use can also add to potential habitat in the projects?

Mr. GRINDSTAFF. Looks like I get this one.

Mr. ISSA. You get the whole State of California here.

Mr. GRINDSTAFF. The whole State of California. Conjunctive use is really—in the first place, the places where you can store water are typically places where we've pumped the ground water table down. So when you add water to the ground water table, you are naturally providing more water for habitat, and that can make a significant difference directly overhead.

And typically, if you're next to a stream, then you're going to have water flowing out, and that's going to help provide year-round flow to that stream. That's a critical thing over the long term as a critical way to help provide water for habitat.

It is a significant benefit when we develop those programs. And when we evaluate, as a State, when we give a grant to Tony or to any other entity, that's one of the things that we look for is: have we incorporated that value into the program as we move ahead?

In most cases, where we develop a program, they have. That is one of the benefits that we receive.

Mr. ISSA. I am going to probably close with one last question, but it again goes to Mr. Kucinich, who couldn't remain. He seemed, in his opening remarks, to have considerable concern for ground water contamination, the other potential problems with—Joseph, you were pretty good at saying it can be a factor.

I am not, by any means, experienced as an engineer in any of this. But I do own a swimming pool, and I have a filter. The filter becomes pretty useless if you simply continue to use it to filter forever. But, in fact, you can back-flush it after you run the back-flow, essentially sending down to, in my case, the ocean in San Diego.

The water, you, in fact, have a filter that can be reused again. How does that work or does it work as part of the consideration when we are using the ground table and you potentially, let us say, get a high salt content over time, something along that line? Are there factors where, in fact, there is some similarity, and you can manage the ground as a filter?

Mr. GRINDSTAFF. From my perspective, one of the great benefits of conjunctive management is that you can improve ground water quality, and you have to design that in. You have to think about that when you're starting.

But the solution to poor water quality is to not just leave it in the ground and let the contaminant, whatever it is, buildup there. The solution is to get it out of the ground. And over time, the best way to do that, typically, is to pump the water out and treat it and remove the contaminant.

So whether in Orange County, they're doing the ground water replenishment system, where they're dealing with salt by putting virtually salt-free water into the ground water table, and they're going to reduce the TDS of their ground water table significantly.

Or if it's a program where in the Chino Basin, they're putting recycled water into the basin at a higher TDS level, but at the bottom end of the basin, they're pumping it out and treating it and removing all of the excess salt. Over time, they remove much more salt than they put in. So they're improving the water quality.

I think it's a key element, and there are issues. But they are certainly the kinds of things that you can address. In fact, I think it provides an economic incentive, if done right, to clean up the ground water. So that Tony has an interest in maintaining quality in that basin and improving that basin because he's putting more water in.

So I'm—you can tell I'm an unabashed supporter.

Mr. ISSA. Go ahead, Tony.

Mr. PACK. I would almost echo what Joe has said. In the Menifee/Romoland/Perris/Moreno valley—that entire valley basin there—the ground water levels are rising because many of the agricultural users have left. And as that has risen, it is going into the Vatos, and it is picking up contaminants. But it also is four to five times more saltier than we're allowed to serve as drinking water.

So we've been developing an extensive well conveyance and desalination system in that area. We have two plants up and running now and a third under design. And we're actually removing all the salts and sending them down through the SARI line to the Pacific Ocean.

We're not only preventing further contamination as the ground water levels rise, but we're actually taking out the salts and replacing it with lower salinity water.

Mr. ISSA. Yes, Jason.

Mr. PELTIER. Yes. The U.S. Geological Survey will be—is scheduled, anyway, to release a report. It's kind of a national survey of volatile organic compounds found in ground water across the United States later this month. I think, you know, it's safe to say that we find VOCs a lot, not, however, at levels—very, very rarely at levels which are of concern, but they're there.

You have hit on something, that the re-injection or the percolation of chlorinated water back into the—in the ground water basin has implications, and we need to be mindful of them. Because the notion of what a gallon of gasoline can do to an aquifer is real.

So I think that's part of those things that some might view an impediment. Others with responsibility for protecting water resources would look at as that's part of our role and responsibility in making sure that future generations have the benefit of a good water supply.

Mr. ISSA. I want to thank you all. I am going to revise and extend in one sense because you brought up gasoline.

California is very concerned about the legacy of MTBE. We continue to have, to be honest, a fertilizer is not an insignificant contamination, and I am always befuddled to realize that fertilizer into the ground water is more of a problem in residential areas than it is agricultural areas. It is always amazing. We assume it is farms when, in fact, it is sod as often as not.

Is it fair to say—I don't want to put words in your mouth, but I am almost doing that—is it fair to say that in all cases, active management of the water table, including conjunctive use, gives us an opportunity to do more about taking out MTBE or other contaminants than, in fact, not doing it?

That there is no case, the reverse of it, there is no case in which by definition we are better off not doing, injecting anything into the ground table, dealing with the ground table and just hoping that it goes away?

Mr. PELTIER. I'm really tempted to—my degree is in agriculture, and my minor is in economics. It's not in geohydrology or geochemistry. I don't want to answer your question. I would say——

Mr. ISSA. But you were glad I defended the farmer on his fertilizer, weren't you?

Mr. PELTIER. I would say the simple answer to your absolute question is, no, it's not always true. Because nothing is, in my experience, always true. There is always exceptions.

Mr. ISSA. Didn't I say generally? I could have the record read back, and I guarantee that they will read it back the way I want it to. [Laughter.]

Generally?

Mr. PELTIER. Generally.

Mr. ISSA. Thank you.

Joseph.

Mr. GRINDSTAFF. Active management, I think, is always better. But that doesn't mean that there aren't cases where, for example, you have a concentrated plume of a contaminant, where it is not better to treat that plume without putting water in there and spreading it further.

I think you have to look at those issues on a case-by-case basis.

Mr. ISSA. OK. Tony.

Mr. PACK. The bottom line really is there isn't any more surface water. We've got to use conjunctive use, desalination, recycled water. We've got to go to all these options to meet the future demands.

You really don't have a choice not to use ground water, and like Joe says, you manage it, and you look to what you're treating. In many cases, treatment is a function of how much money you want to spend.

Mr. ISSA. Well, you have completed the record very well for us. I thank you for doing it in a timely fashion.

The record will remain open for at least 10 legislative days so that you may add any comments that you think of, things that you want to revise and extend with, and so that Members that will have an opportunity to put their comments or questions in.

And once again, I thank you all for your presence.
This meeting is adjourned.
[Whereupon, at 2:55 p.m., the subcommittee was adjourned.]
[Additional information submitted for the hearing record follows:]

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April 21, 2006

VIA EMAIL

The Honorable Darrell Issa
Chairman
House Committee on Government Reform
Subcommittee on Energy and Resources
B-349C Rayburn
Washington, DC 20515

Dear Chairman Issa:

Please find attached testimony to be submitted for the record by the Coachella Valley Water District and the Desert Water Agency. Their statement pertains to the April 5, 2006 hearing on "Conjunctive Water Management: A Solution to the West's Growing Water Demand?".

Sincerely,

Joseph T. Findaro

Conjunctive Water Management for Growing Water Demands in the West

Submitted for House Government Reform Subcommittee on Energy and Resources Hearing, of April 5, 2006

"Conjunctive Use: Linking the Colorado River and Central California Systems"

Statement from the Coachella Valley Water District and the Desert Water Agency

Summary

Neither the Colorado River system nor the Central California systems (Central Valley Project and State Water Project) manage high flows to maximize the satisfaction of both consumptive and in-stream needs. During wet periods, high runoff from both systems flows to the ocean despite critical unmet needs for the systems and the environment (see Figure 1).

High flows to the ocean are common in the Central California system during wet years. For example, the current wet conditions this winter have resulted in large volumes of water flowing to the ocean via the Sacramento River. This is due to the relatively small volume of surface storage in the Central California systems compared to its average annual flows. Linking the Central California systems to the Colorado River system would make better use of existing storage and enhance capture of a portion of water runoff during wet years that would otherwise flow to the ocean. Effectively, the yield of both systems would be improved.

Once linked, the two systems could move water to groundwater basins for long-term storage. Groundwater aquifers in California, Arizona, and other states could be linked by the ability to move water from either excess surface flows or from surface storage in one system or area into groundwater storage in another, making more room for flood waters in the surface reservoirs. While there are many institutional hurdles that would have to be overcome, the new water created by this linkage could be used to benefit a multi-state region.

Hydrologic Systems

Colorado River System. The Colorado River system has roughly 60 million acre feet of storage in Lakes Powell, Mead, Mojave, Havasu, and other reservoirs. Historically, Colorado River flows average about 14 million acre-feet annually. Average inflow is the subject of much debate with some estimates significantly less than 14 million acre-feet.

In all estimates, available storage is more than four times greater than the average annual flow.

While the Colorado River system has significant storage capacity, nevertheless during years like 1983 the reservoirs filled entirely and excess water flowed to the ocean in the face of critical unmet needs for the systems and the environment. As demand grows, years with flow to the ocean can be expected to diminish.

Central California Systems. The combined federal Central Valley Project (CVP) and California State Water Project (SWP) have average annual flows of roughly 18 million acre-feet. The variability of the flows in the Central California systems is greater than the variability of annual flows in the Colorado River. Storage volume available to capture water is much lower, with roughly 12 to 15 million acre-feet in Lakes Shasta, Oroville, Pyramid, Castaic, Perris, San Luis Reservoir, and other California reservoirs.

Total surface storage of the two Central California systems is less than the systems' average annual flow highlighting the need for storage (see Figure 1). The Central California systems also rely extensively on the snow pack in the Sierra Nevada Mountains to store water. Because the melting of the snow pack is unpredictable, there are frequently periods when excess water flows to the ocean via the Sacramento River Bay-Delta. This decreases the potential yield.

The need for storage in the Central California systems presents challenges to both environmental and system objectives as well as hindering optimal conjunctive use of groundwater storage. Regional groundwater storage programs benefit from using surface storage as a "holding basin", moving the water quickly into groundwater aquifers to free up storage volume in the surface reservoir for the next wet period and allowing in-stream benefits to be continued for longer periods. This enhances both the environmental and system benefits for the watershed.

Groundwater Storage

Linkage of the Colorado River and the Central California systems would enable management of existing water supplies including conjunctive use of surface and groundwater storage. Use of existing groundwater storage instead of surface storage has the following or environmental benefits:

- Does not require new dams
- Does not flood existing habitat
- Does not have significant evaporation losses
- Naturally filters the water

Groundwater storage has another advantage over surface storage long-term. It does not need to be drained each year to make room for potential spring flooding when the snow melts in the mountains.

Facilities

Large conveyance facilities to move Colorado River water from east to west already exist. These are the Metropolitan Water District of Southern California's 1.2 million acre-foot per year Colorado River Aqueduct (1800 cubic feet per second capacity) and the Coachella Branch of the All American Canal with a capacity of 0.95 million acre-foot per year (1300 cubic feet per second capacity). Both facilities can move Colorado River water west to large groundwater basins. Once delivered to groundwater basins, there are existing recharge basins and extraction wells to enable use of the water in lieu of State Water Project water.

The major new facility that is still needed to move State Water Project water from the west to the east is the planned "Desert Aqueduct". It will connect the State Water Project north of San Bernardino to the 30 million acre-feet groundwater basin jointly managed by the Coachella Valley Water District and the Desert Water Agency. While some water can currently be "moved" from west to east now through in-lieu or exchange agreements (the Metropolitan Water District of Southern California trades some of its Colorado River water to the Coachella Valley Water District for some of the latter's State Water Project water), the amounts are small and constrained by the exchange capacity of Metropolitan's Colorado River Aqueduct (for every acre-foot "moved" eastward, Metropolitan must reduce Colorado River imports by an acre-foot).

A "Desert Aqueduct" would enable better use of the Coachella Valley's 30 million acre-feet groundwater basin for storage. Also, it could enable additional conjunctive use of the two largest river/reservoir systems in the West. Extensive groundwater basins exist in both watersheds. Whenever excess water is flowing to the ocean rather than being stored in surface or groundwater basins, there is potential to better manage water resources for unmet environmental and system needs.

Preservation of Water Rights and Allocations

Linkage of the Colorado River and the Central California systems would have to be based on preservation and protection of existing water rights and allocations. The potential to improve the yield of both watersheds could not be allowed to interfere with existing water rights. Better use of surface and groundwater storage would proceed only when it has been demonstrated to be "win-win" as a result of capture of water that would otherwise flow to the ocean.

Energy Benefits

Linking the two watershed systems would result in energy savings as well. New yield from conjunctive use of surface and groundwater storage saves energy by avoiding the need to utilize energy-intensive new sources of water. This is because the marginal new source of supply for much of Southern California may become the desalination of seawater. Desalination of seawater with reverse osmosis membranes requires 4,000 to

5,000 kilo-watt hours of electricity to produce one acre-foot of water. Harvesting additional yield in both watersheds would require much less energy.

Potential Difficulties

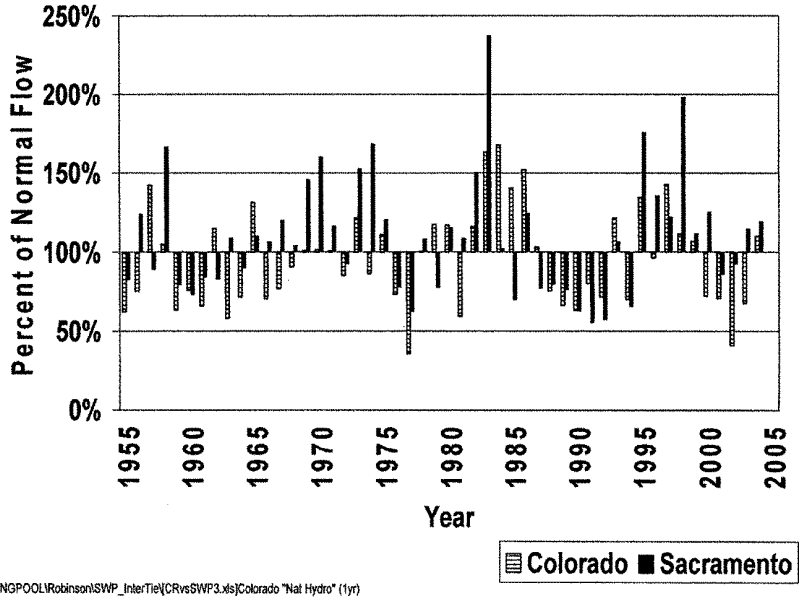
Linking the Colorado River and the Central California systems would take a major effort. There would be many institutional, legal and technical hurdles to overcome. A few of these difficulties are as follows:

- **Institutional Issues**. Melding the Law of the River (Colorado River) with existing Central Valley Project and State Water Project contract and institutional requirements would be difficult. Federal legislation and leadership of federal agencies such as the US Bureau of Reclamation would be needed to overcome these institutional hurdles.
- **Water Rights**. All of the flows in both watersheds involve water rights issues. Basically, all of the flow is allocated. Existing holders of water rights must be made whole if transfers between watersheds are to take place. This may require incentives and/or the leadership of the US Bureau of Reclamation.
- **The need for a Bay-Delta Solution**. To fully realize the potential of a linkage between the Colorado River and the Central California systems, a Sacramento River Bay-Delta solution is also needed. Without a Bay-Delta solution, "new" water developed by this linkage could be mired in controversy and subject to seismic risks. Also, the vulnerability of existing levees in the delta to seismic failure needs to be resolved to ensure reliable use of storage and to ensure reliable basin yield.
- **Financing the Desert Aqueduct**. The Desert Aqueduct is estimated to cost at least $1 billion. The capacity and potential of the Desert Aqueduct to enhance conjunctive use of surface and groundwater storage is constrained by cost. Federal financing could help pay for a proportionate share of this facility to optimize the regional benefits.

Benefits

The new water created by this linkage could be used to benefit a multi-state region. Effectively, the potential for both systems would be improved. Linking the two systems together would better manage water that otherwise would flow to the ocean. Also, it would enhance regional ability to conjunctively use surface and groundwater. In addition to water benefits, linking the two watershed systems could result in energy savings because new yield from existing reservoirs reduces the need to use seawater desalination.

Figure 1
Wet Verses Dry Cycles of
Colorado and Sacramento Rivers



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