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WATER RESOURCES
REPRESENTING THE STATE OF ARIZONA

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER
COMMITTEE ON NATURAL RESOURCES

UNITED STATES HOUSE OF REPRESENTATIVES

REGARDING

WATER QUALITY ISSUES IN THE LOWER COLORADO RIVER

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Thank you for the opportunity to provide the following comments regarding important Lower Colorado River water quality issues. The Colorado River provides water to seven western states and the country of Mexico. This valuable water supply irrigates 1.8 million acres of cropland producing 15 percent of U.S. crops. Eighty percent of U.S. winter vegetables are produced with Colorado River water, mostly from Arizona's Yuma Valley. The River provides drinking water to over 25 million people, and is a vital part of the water supply for mainstream Arizona communities and the cities of Phoenix and Tucson. Colorado River water is Arizona's largest renewable water supply.

The Director of the Arizona Department of Water Resources (ADWR) is generally responsible for formulating plans for the development, management, conservation and use of water throughout the state (A.R.S. § 45-105). The Director has specific statutory authority with regard to Colorado River water. Arizona statute directs Arizona entities to confer with and obtain the advice of the Director regarding negotiations, contracts and subcontracts that affect the allocation and use of mainstream Colorado River water or Colorado River water delivered through the Central Arizona Project. The Director represents the State of Arizona in policy negotiations regarding Colorado River operations and administration of water rights, referred to as entitlements. To more fully represent the state of Arizona's position on Colorado River issues dealing with water quality, the Department of Environmental Quality's (ADEQ) views also need to be included. I have conferred with the ADEQ and soon to be ADEQ Director Benjamin Grumbles, who was EPA's Assistant Administrator for Water, about my testimony and have included their input in this testimony.

With a growing population placing additional demands on a limited supply, water quality issues can further impact the availability of that supply for industry, agriculture and municipal needs. Although the ADWR is not the agency charged with compliance with the Clean Water Act or the Safe Drinking Water Act, it closely monitors Colorado River water quality issues

and confers with the ADEQ on remediation or pollution issues. This coordination is necessary because of the inseparable link between water quality and quantity. Collaboration with our sister agency is essential to maintaining a safe and adequate water supply for Arizona. Existing compliance programs, federally funded remediation work, and cooperative programs involving all of the Colorado River Basin States have created an effective framework for successfully managing most Colorado River water quality issues. The ADWR and the ADEQ are particularly interested in the continued successful management of Colorado River salinity and selenium, and the successful completion of the project to remove the uranium mill tailings outside of Moab, Utah.

Colorado River water salinity has been a major concern in the U.S. and Mexico for many years. The river becomes increasingly saline as it flows downstream. Colorado River system salinity is due to naturally occurring saline sediments that were deposited in prehistoric marine environments. The salts contained within these sedimentary deposits are easily eroded and transported into the River.

Increased salinity levels affect agriculture by reducing crop yields and adding labor and chemical treatment costs. Urban water users must replace plumbing and water-using appliances more frequently and industrial water users and water and wastewater treatment facilities also experience reduced useful life of equipment. Salinity damages within the United States are estimated at $330 million per year. Unquantified but substantial economic damages also occur in Mexico.

In the early 1960's, Colorado River salinity became a contentious issue with regard to the water delivered to Mexico pursuant to the Mexican Water Treaty of 1944 (Treaty). In 1961 Mexico lodged a formal protest with the United States claiming that the saline Colorado River water delivered to Mexico was damaging agricultural crops. The salinity of the Treaty delivery increased after the Wellton-Mohawk Irrigation and Drainage District began discharging saline groundwater and return-flows to the Colorado River above Morelos Dam, Mexico's primary diversion point.

A number of measures have been implemented to address the salinity of the Colorado River. In 1972, the Environmental Protection Agency (EPA) required development of water quality standards for salinity of the Colorado River in accordance with Section 303 of the Clean Water Act. The following year the seven Colorado River Basin States formed the Colorado River Basin Salinity Control Forum (Forum).The ADWR along with the ADEQ represent the state as members of the Forum.

The Forum developed numeric salinity standards for three locations in the Lower Basin as well as a basin-wide plan of implementation. The numeric criteria are as follows:

Below Hoover Dam	723 mg/L
Below Parker Dam	747 mg/L
At Imperial Dam	879 mg/L

The EPA approved the numeric salinity standards and the plan of implementation adopted by the States. Implementation of the salinity control plan has ensured compliance with the

numeric criteria while still allowing the Basin States to develop water allocated under the Colorado River Compact.

Damages to agriculture in Mexico led to the passage of the Colorado River Basin Salinity Control Act of June 24, 2974 (Public Law 93-320). The Salinity Control Act (Act) authorized a temporary measure to reduce the salinity of the Treaty water delivery by redirecting the brackish Wellton-Mohawk drainage water away from the Colorado River, where it had previously been counted as part of the Treaty delivery of 1.5 million acre-feet, and redirected this water to the Cienega de Santa Clara (Cienega) in Mexico where it is not counted as part of the Treaty delivery. The Cienega now forms an important habitat for migratory birds and other animals. Each year approximately 110,000 acre-feet of water is bypassed to the Cienega.

Title I of the Act authorized the construction of the Yuma Desalting Plant, which was intended to capture and treat the drainage water flowing to the Cienega, and return most of it to the River for delivery as part of the Treaty obligation. The Yuma Desalting Plant was built and operated briefly, at one-third capacity in 1993, but the test run was cut short when flood flows on the Gila River damaged the intake canal. High flows in subsequent years reduced the salinity of the river sufficiently that the plant was not run for many years. Ultimately, the plant was placed in "ready-reserve" status, when costs to repair the damaged intake canal and to operate the plant were considered too high to warrant its operation. The plant was operated again at ten percent capacity for a 90-day test period in 2007. The impact of a prolonged drought in the Colorado River Basin has generated renewed interest in operation of the Yuma Desalting Plant. Efforts are currently underway for a pilot run of the plant at one-third capacity to evaluate the potential for future operation.

Title II of the Act created the Salinity Control Program, and authorized the construction of specific salinity control projects by the Bureau of Reclamation and the U.S. Department of Agriculture. Additional salinity control projects under Title II are implemented and funded through the Basin States Program.

An additional benefit from the control of salinity is selenium control. Selenium is a metalloid substance and like salt it is also found in marine sedimentary rocks. Although trace amounts of selenium are essential in the human diet, elevated selenium levels were identified as the cause of mortality, deformities and reproductive failure in aquatic birds at the Kesterson Reservoir in California in 1983.

In 2004, the Selenium Subcommittee of the Salinity Control Forum issued a recommendation to the Forum on selenium control. After review of the available literature, the Subcommittee recommended that selenium control should be considered a benefit from salinity control projects. The Subcommittee recommended that salinity control project applicants be encouraged to apply for salinity control projects that also control selenium. If projects control both salinity and selenium at the same cost to the Salinity Control Program, the joint control project should be chosen. The Subcommittee recommended that selenium reductions caused by all salinity control projects be measured, quantified and reported to state and federal agencies with water quality and selenium management responsibilities on the Colorado River. The reported data is expected to aid regulatory agencies in the development of standards and control technology that is consistent with the Colorado River Salinity Control Program.

The ADWR and the ADEQ are pleased that the Department of Energy (DOE) has begun work to remove the uranium tailings at the Moab Uranium Mill Tailings Remedial Action Project (UMTRA) site. In May 2009, Salinity Control Forum members had an opportunity to visit the UMTRA site located just north of Moab, Utah on the west bank of the Colorado River. The uranium tailings cover approximately 130 acres and when mining operations ceased in 1984 approximately 12 million cubic-yards of mill tailings and tailings-contaminated soil were present at the site. DOE has constructed facilities to transport the tailings from Moab to a disposal site at Crescent Junction. The UMTRA site has been a concern not only because of potential erosion of the tailings into the Colorado River, but also because of elevated ammonia levels in groundwater at the site.

In 2003, DOE installed a series of wells to intercept contaminated groundwater before it could reach the river. The system has been expanded over time and now consists of four sites with ten interceptor wells each. More than 130 million gallons of contaminated groundwater have been extracted so far. DOE conducts monthly sampling to monitor surface and groundwater conditions.

The ADWR and the ADEQ believe that the Salinity Control Program is a great example of a successful cooperative effort between federal agencies and the seven Colorado River Basin states to meet state, national and international water quality objectives. Salinity control measures implemented by this program control 800,000 tons of salt annually. In 2008, the Forum reviewed the numeric criteria and determined that based on current water use trends in the Lower Basin and ongoing progress toward accomplishing all measures identified in the plan of implementation, the current numeric criteria are adequate and should be maintained for the next three years.

The ADWR and the ADEQ have also been monitoring mitigation efforts for hexavalent chromium (chromium 6) sites in California at Topock, near the I-40 river crossing, and at the former McCulloch manufacturing plant in Lake Havasu City. Chromium can be ingested, inhaled or absorbed through the skin. Chromium can cause systemic poisoning, skin ulcers, eye damage and lung cancer. Both sites are being monitored, and a groundwater extraction mitigation project was implemented at the Topock site in 2004, to remove contaminated groundwater and change the direction of local groundwater flow away from the river. Injection wells have also been drilled at the Topock site to re-inject treated water back into the aquifer. The ADEQ has initiated a study to determine if contaminated groundwater has reached Arizona. Monitoring continues at both sites to better define the extent of the chromium plume.

Other pollutants of concern include nitrogen and coliform bacteria. The ADWR and the ADEQ are aware of the work that has already been completed by the Colorado River Regional Sewer Coalition (CRRSCo), and particularly by Bullhead and Lake Havasu City to provide municipal sewage treatment for these communities. These projects have been implemented to address nitrogen and coliform bacteria pollution from septic systems. High levels of nitrogen can cause a number of problems which range from algal blooms and cloudy water which may impact local tourism, to human health threats. Elevated nitrate levels can be accompanied by higher than normal fecal-coliform counts, which may indicate the presence of pathogenic bacteria. ADEQ, California EPA and Nevada Department of Conservation and Natural Resources have adopted nitrate-nitrogen and nitrite Maximum Contaminant Level (MCL) limits of 10 mg/L and 1 mg/L respectively. Great progress has been made by these communities and other

CRRSCo members to address nitrogen and coliform bacteria pollution, but increased costs due to factors largely beyond the control of the communities have put these efforts at risk. We remain concerned about the project being completed in a timely manner.

While perchlorate contamination was found in Metropolitan Water District of Southern California's Colorado River supply in 1997, the primary sources were quickly identified at southern Nevada industrial sites and a joint remediation plan was implemented. The remediation plan has shown excellent results and while treatment and monitoring continue, the immediate concern has been mitigated. The ADWR and the ADEQ support continuation of the remediation and monitoring plans until all sampling sites exhibit a non-detect level for perchlorate.

Another form of "biological contamination" is the invasive quagga mussels recently discovered in the Colorado River system. This species of mussel is threatening the integrity of the entire water infrastructure of all Colorado River water users. This bivalve reproduces so rapidly that it can clog inlet structures, pumps, pipelines, gates and other conveyance facilities in few months. Unless a way is found to control this infestation, maintenance of water facilities will require constant attention at drastically increased expense. This mussel that has infested the Great Lakes Region for many years has a totally different environment in the West. A cooperative research program is urgently needed to evaluate different treatment and control methodologies that would be effective in the West. Federal assistance will be required in this concentrated effort.

The Colorado River water supply is dependent on snowfall in the mountains of Eastern Utah, Southwest Wyoming and Western Colorado. This area is currently experiencing a prolonged drought. Global warming will only exacerbate these periods of drought on this already over allocated, water short drainage. The Seven Basin States that share the water resources of the Colorado River will need federal assistance in developing and implementing mitigation and augmentation plans to counteract the impacts from global warming.

Although Colorado River water quality issues must continue to be researched, monitored and remediation efforts completed, the ADWR and the ADEQ believe that existing compliance programs, federally funded clean-up work, and cooperative programs involving all of the Colorado River Basin States have created a basic framework for successfully managing most Colorado River water quality issues. Still more needs to be done with continued focus on collaboration at the federal, state and local levels. Although the Department of Water Resources is not the agency responsible for implementation of the Clean Water Act or Safe Drinking Water Act, it works hand in hand with the Department of Environmental Quality to make certain that water quality issues do not impact the availability of the state's Colorado River water supply for agriculture, industrial and municipal use. Both the ADWR and the ADEQ support the work of CRRSCo to further improve Colorado River water quality, but understand that this important work is at risk because of the high cost. The ADWR and the ADEQ support federal assistance for these communities to complete the work that they have started, and which benefits all Colorado River water users.

We also support continued research associated with emerging pollutants such as pharmaceutical residuals. It very important to identify the potential human impacts associated with these contaminants so we can remove them from our water supplies where necessary.

Research on cost effective methods of treatment for these chemicals is also needed. Incoming Director Grumbles has particular experience under the SDWA and the CWA on emerging contaminants and looks forward to efforts to strengthen the science, increase understanding, and strengthen product stewardship and waste management in response to concerns over pharmaceuticals and personal care products.

In conclusion, the ADWR and the ADEQ support efforts to foster a regional collaboration at the federal, state, and local levels using existing tools and exploring new ones so that we can address current and emerging challenges to the heath of the River in the most sustainable manner possible.

Again I want to thank you for the opportunity to share State of Arizona's concerns on Colorado River water quality issues with this Subcommittee on Water and Power