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Testimony
Before the Committee on Resources
United State House of Representatives

Colorado: Options to Increase Water Supply And Improve Efficiencies

December 12, 2003

Denver, Colorado

INTRODUCTION

Denver Water is an agency of the City and County of Denver, the largest municipal public utility in Colorado, serving water to over 1 million people, about one-quarter of the state's population. Because Denver was one of the earliest communities in Colorado, and thanks to a number of visionary leaders in the early 20th century, Denver Water enjoys relatively senior water rights, and storage and transmission facilities that are the envy of water suppliers nationwide.

DENVER WATER'S APPROACH TO WATER SUPPLY

Denver Water completed an Integrated Resource Plan (IRP) in 1996 that identified an overall requirement of 100,000 more acre feet of firm yield in order to serve our combined service area to geographic build-out. A more detailed description of the IRP and Denver Water's resulting activities appears later in this testimony. Upon completion of the IRP, the Denver Water Board determined to produce the increased supply needed until 2030 through three basic approaches:

1. ***Conservation*** – Elements of conservation include the "natural replacement" that occurs when older water fixtures are replaced with newer, more efficient fixtures; incentive programs funded by Denver Water; and regulatory programs implemented by both Denver Water and general purpose governments. The IRP concluded that 16,000 acre feet of "supply" could be created through conservation. (An average single family residence in Denver Water's service area uses about .6 acre foot of water per year.)

2. ***Reuse or recycling*** – The IRP proposed that approximately 15,000 acre feet of new supply be created by treating effluent from a wastewater treatment plant to nonpotable standards to be used for irrigation and industrial purposes. For every acre foot of recycled water used, one less acre foot of potable water needs to be stored, treated and distributed. As a result of the IRP analysis, Denver Water's recycled water plant was put on a fast track. The $60 million treatment plant is nearly completed and will begin delivering water next spring.

3. ***New supply*** – While new supply might be viewed as the traditional solution to water needs, the IRP emphasized alternatives to Denver Water's time-honored approach of unilateral construction of new reservoirs. The IRP recommended system refinements, which could include changing ditch irrigation rights to municipal use, conversion of park irrigation from potable to nonpotable water, and improvements in distribution facilities, and joint-use cooperative projects developed with partners. In addition, the plan contemplated new supply projects that could include enlargement of existing reservoirs or construction of relatively small new reservoirs.

With regard to Denver Water's water supply, or any other water supply in Colorado, the truth discerned through the three-year IRP process is that there is no silver bullet. No

single approach, much less a single project, can resolve the need for water supply. Conservation is very important and can provide the least-cost supply, but it is not a panacea. Certainly any entity contemplating new supply must first ensure that it has placed the maximum reasonable reliance on conservation in order to minimize the costs of new supply and maximize the acceptability of the project. Reuse of effluent is also important. If the appropriate water rights exist, the supply of effluent is dependable and relatively drought-proof. However, reuse of effluent requires expensive treatment capacity and also results in lower flows in streams to which the effluent is presently being discharged. New supply in the form of reservoirs is also beneficial, but presents the well-known tension between the environmental benefit of water left in streams and the human benefit of water used for domestic purposes. All three approaches should be included in efforts to enhance water supply.

OPTIONS TO INCREASE WATER SUPPLY

As discussed above, new supply projects are not the sole or even the primary solution to water needs. However, when new supply is an appropriate solution, there are several ways in which Congress could improve the likelihood that viable projects will in fact be implemented.

1. ***Remove regulatory limitations on the use of federal loan funds.*** The Safe Drinking Water Act Amendments of 1996, *P. L. 104-182*, created the Drinking Water State Revolving Fund (DWSRF) to provide financial assistance to public water systems. Although the statute does not require such a result, *see 42 U.S.C. § 300j-12 (a)(2),* EPA regulations do not permit the funds to be used to enhance water supply, at least in the ways that supply is normally enhanced in the West. While eligible projects are allowed to "rehabilitate or develop water sources," EPA specifically prohibits use of the funds for reservoirs, dams, dam rehabilitation or water rights. *40 C.F.R. § 35.3520(e).* This regulatory limitation has caused problems for water projects in Colorado; Congress could easily rectify this situation by means of instructions to EPA.

2. ***Clarify that water transfers do not require NPDES discharge permits*.** The judiciary has recently increased dramatically the scope of the Clean Water Act's requirement that any addition of pollutants to the nation's waters be subject to an NPDES permit issued by EPA. Despite 30 years of contrary experience under the Clean Water Act, two federal circuit courts have held that transfers and diversions of natural, untreated water as part of water supply or water quality systems are subject to regulation by means of NPDES permits. *Catskill Mountains Chapter of Trout Unlimited, Inc. v. City of New York, 273 F.3d 481 (2nd Cir. 2001); Miccosukee Tribe of Indians v. South Florida Water Management Dist., 280 F.3d 1364 (11th Cir. 2002)*. It is almost impossible to overstate the danger these cases pose to the operation of water supply systems, both current systems and certainly any new supply project. More than two million dams and countless other diversion structures throughout the United States would become subject to permit requirements that might well be impossible to satisfy. Fortunately, the U. S. Supreme Court will hear one of the cases in January.

South Florida Water Management District v. Miccosukee Tribe of Indians, et al., *No. 02-626*. However, a decision would probably not be forthcoming for several months, and judicial interpretation is not always predictable. Since the issue in the litigation is whether Congress intended to regulate water transfers diversions as point sources rather than nonpoint sources, *compare 33 U.S.C. § 1362(12) with 33 U.S.C. § 1314(f)(2)(F)*, Congress has the ability to clarify its intent and provide definitive protection for the water supply systems on which the nation depends.

3. ***Ensure that the Endangered Species Act does not prohibit water supply projects.*** In the semi-arid West, the competition for water is fierce, and the competitor with the trump card is the Endangered Species Act. If the U. S. Fish and Wildlife Service determines that flows are needed by a threatened or endangered species, then water is not available to be developed or stored for human needs. *See Rio Grande Silvery Minnow v. Keys, 333 F.3d 1109 (10th Cir. 2003)*(holding that the Bureau of Reclamation must reduce deliveries required by contracts that pre-date the ESA to protect the minnow). The fundamental protections of the ESA should remain in place. The ESA works to protect important habitat and ecosystems, and the public supports its purpose. What would be most useful to water suppliers is the development and implementation of recovery programs for all species that have been listed. Where recovery programs are in place, water development can occur. For example, the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, developed over many years, has allowed existing and new depletions to the Colorado River to occur without jeopardy opinions. Congress should provide significantly increased funding for recovery programs under the ESA. To make the development of recovery plans more workable and rational, Congress should also amend the statute to move the designation of critical habitat to a more sensible place in the process, the development of the recovery plan. At present, the statute requires designation of critical habitat "concurrently" with the listing of the species, or at least within one year. *16 U.S.C. § 1533(a)(3)(A) and (b)(6)(C)*. This requirement forces Fish and Wildlife either to make completely uninformed decisions about habitat and, in the interest of caution, designate much more area than necessary, or to violate the statute. Fish and Wildlife has been placed in the untenable position of routinely losing lawsuits for failure to designate critical habitat within the statutory deadline, *e.g., Forest Guardians v. Babbitt, 174 F.3d 1178 (10th Cir. 1999),* and then losing another lawsuit because its hasty compliance resulted in an inadequate designation. *E.g., Middle Rio Grande Conservancy District v. Babbitt, 206 F.Supp.2d 1156 (D.N.M. 2000)*. Congress can rectify this counterproductive dilemma by including critical habitat designation as part of development of recovery plans, and providing sufficient funding that recovery plans can actually be implemented.

4. ***Clarify the meaning of "waters of the United States" under the Clean Water Act*.** In the years since the passage of the Clean Water Act in 1974, the extent of its jurisdiction has been subject to "regulatory creep". The Act regulates under

the NPDES program discharges into "navigable waters", *33 U.S.C. § 1344(a),* which are defined in the statute as "waters of the United States." *33 U.S.C. § 1362(7).* The U. S. Supreme Court recently held that the Corps of Engineers had exceeded its authority when it interpreted the Act to cover an isolated, intrastate gravel pit. *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, 121 S. Ct. 675 (2001)*. However, a new threat to water suppliers arises from a Fourth Circuit case, *United States v. Deaton*, *332 F.3d 698 (4th Cir. 2003)*, which upholds the Corps' assertion of jurisdiction over a roadside drainage ditch. The Corps' theory is that the drainage ditch eventually empties into a navigable water. Of course, that is what drainage ditches are intended to do, transport storm water and other surface water off roads and developed land into streams and rivers. These drainage ditches are considered sources of pollutants at the point where they discharge into streams and rivers, and are regulated under stormwater management programs. It is difficult to see how they can also be "waters of the United States." The problem for water suppliers is that water systems frequently include ditches of many types, and any eventual connection with a stream could subject them to control by the Corps of Engineers and EPA under the Clean Water Act. Congress could clarify the definition of "waters of the United States" to exclude ditches and other manmade structures.

OPTIONS TO IMPROVE WATER USE EFFICIENCY

As discussed above, conservation and reuse can be important sources of water supply. Congress has an important role to play in enhancing the productivity of these potential sources.

1. ***Create water efficiency standards for appliances*.** The federally mandated production of low-volume toilets has been very effective in helping to reduce indoor water consumption. Congress could further increase indoor water conservation by creating water efficiency standards for other water-using appliances such as dishwashers and clothes washers. These standards could either be mandated, as was the case for toilets, or could form the basis for water efficiency product labeling. Denver Water offered a rebate for horizontal axis clothes washers during the recent drought, and the response from our customers was overwhelmingly positive.

2. ***Enhance the effectiveness of irrigation systems*.** Automated irrigation systems are becoming the norm in residential developments in the West. Since irrigation constitutes more than 40% of Denver Water's water use, any savings in irrigation enhances overall supply. Congress could facilitate the manufacture of more efficient irrigation systems in two respects. First, water efficiency labeling could be initiated, so the customer could determine in advance which system would produce greater efficiency. Second, Congress could mandate that new controllers include a rain sensor, which prevents operation of the irrigation system during precipitation events. Since rain sensors avoid wasting water, their inclusion in new irrigation controllers would benefit both consumers and water

providers.

3. ***Prohibit restrictive covenants that restrict water-wise landscaping.*** Although restrictive covenants are contractual, when they violate important public policy, they are unenforceable. Several local governments have prohibited new covenants that require a certain amount of turf, or restrict the use of Xeriscape or other drought-tolerant landscaping. *E.g., Denver Rev. Municipal Code § 57-100;Colo. Rev. Stat. § 37-60-126(g)(11).* Congress could greatly enhance the use of water-wise landscaping, resulting in significant water savings, if it declared such restrictive covenants to be contrary to public policy.

4. ***Increase funding for recycling of water.*** Recycled water projects are eligible for loans under the Water Pollution Control State Revolving Loan Fund established under the Clean Water Act. However, such funding has in the past been quite limited. As the technology for recycling water has improved and public acceptance has grown, this would be an opportune time to increase funding for recycling projects.

DENVER WATER'S INTEGRATED RESOURCE PLAN

Denver Water's approach to water supplies has undergone profound change during the past several years. In part, this change has resulted from a new and complex political and regulatory environment that culminated in the federal government's 1991 veto of the Two Forks project. Two Forks was designed to capture and store an additional 1.1 million acre-feet of water and was intended to provide for the needs of much of the metropolitan Denver area well into the 21st century.

With the project's veto, Denver Water moved to redefine the boundaries of its service area and reassess its traditional assumptions for providing the water supply needed to meet customer demand within that area. This reassessment was accomplished through Integrated Resource Planning (IRP). Such planning includes techniques to factor in changing public and regulatory sentiment and new technologies, as well as traditional engineering and financial aspects of water utility planning.

A principal policy decision made in the context of the IRP process was that Denver Water would not attempt to expand its service area. Denver Water defined a "Combined Service Area" comprised of the City and County of Denver and 78 suburban Contract Distributors. *See Attachment A.* Denver Water committed to serve the build-out needs of this area, but also agreed to provide fixed amounts of water to certain entities outside the Combined Service Area. This approach allows Denver Water to estimate with more certainty future water needs, as growth within the Combined Service Area proceeds to build-out. The Denver Water Board decided to look outside its Combined Service Area for potential efforts, only when such efforts would be provide a substantial benefit to the Combined Service Area.

In the 1996 IRP, the Board indicated that no single option or project would be sufficient to close the 100,000 acre-foot shortfall between its available supply and demand at build-out. As a central feature of its resource strategy, the Board emphasized the need for a strong

water conservation ethic and additional cost-effective water conservation measures. The Board also committed itself to development of a nonpotable recycled water project and small-scale system refinements, such as conversion of park land from potable to nonpotable irrigation. The Board indicated that new surface water storage would likely be needed toward the end of the near-term timeframe to supplement conservation, reuse and small-scale refinements. To implement its near-term and long-term strategies, the Board set forth certain guidelines:

- When meeting future needs, including development of cooperative projects with others, the Board will pursue resource development in an environmentally responsible manner;
- The Board recognized that "cooperative actions" with other metropolitan entities outside its service area can enhance its near-term and long-term strategies, and directed staff to explore such cooperative actions with entities grouped by quadrants of the metropolitan area;
- The Board cautioned that, as a result of maximizing use of its existing supply, flows in the Platte would be reduced downstream north of Denver, and fluctuation of its reservoirs, such as Dillon Reservoir, would be increased; and
- The Board emphasized that it would not undertake future structural projects on the Western Slope unless such project is developed cooperatively with Western Slope entities for the benefit of all parties concerned.

Supply and Demand. As part of its 2002 update of the IRP, Denver Water revisited various water supply and demand management options. The results of that update show that the Denver Water Board currently has a supply of 375,000 acre-feet of firm annual yield. Much of that increase can be attributed to projects under construction and processes presently underway. For example, 17,000 acre-feet results from Denver Water's nonpotable recycling project, which is under construction and will be fully used over the next decade. Similarly, 5,000 acre-feet are attributable to gravel pit storage, even though these storage reservoirs will not be fully operational for several years.

Current demand on the Denver Water system is now 285,000 acre-feet. Denver Water projects its requirement for build-out of the system in the middle of the 21st century at approximately 450,000 acre-feet.

Conservation. In 1996, the Board set a goal of saving 29,000 acre-feet through additional conservation efforts by the year 2045. The IRP identified two planning horizons: the near-term from 1996 through 2030 and the long-term from 2030 through build-out of the Combined Service Area. The near-term conservation goal established in the IRP was 16,000 acre-feet . Based on this near-term goal, the conservation measures are considered to have saved approximately 2,300 acre-feet.

Staff is currently researching new incentive measures, effective mandates and reasonable rates that meet other Board goals, as well as the conservation goal. This approach will include the education and information measures already in place, and even more cooperation with neighboring utilities, non-profit organizations and trade associations to maximize results.

Non-Potable Reuse. Denver Water is currently constructing a nonpotable water recycling project. The recycling project will take secondary treated wastewater from the Denver Metro Reclamation District plant and treat it to a tertiary level. The basic treatment processes include coagulation, sedimentation, filtration and disinfection with chlorine. Colorado recently implemented control regulations for nonpotable reuse water for urban irrigation areas. Denver Water's recycled water will meet or exceed both adopted and proposed state regulations.

In Colorado, 15 recycling projects are on-line, including Colorado Springs, Aurora and Westminster. Broomfield is planning a new project, and expansions of existing systems are also planned. When constructed, Denver Water's project will be the largest in the state. When it is fully operational in 2013, it in combination with exchanges operated pursuant to state water rights will, in effect, exhaust the yield that can be generated from reusable water until additional reusable water becomes available due to additional growth.

System Refinements or Modifications. The IRP process in 1996 identified numerous small-scale projects to improve water system efficiency, resulting in 10,000 acre-feet of additional firm yield. Today, the yield estimate is 13,000 acre-feet. As a result of the long lead-time and uncertainties of many of these projects, Denver Water is implementing the largest projects to determine their capabilities. Estimated yields and completion dates are shown below.

System Refinement Projects

Project	Firm Yield (acre-feet)	Scheduled Completion
Gravel Pit Storage	5,000	2008
High Line Canal Efficiency	3,000	2009
Strontia Fish Flow Recovery	3,000	2003
Lawn Irrigation Return Flows	500	2009
Others	1,500	Varies
Total	13,000	

Denver Water and South Adams County Water and Sanitation District have jointly acquired six gravel mining sites to develop 8,000 acre-feet of storage needed for river exchanges and 4,000 acre-feet of storage for augmenting the recycling project.

Nearing completion is a Future Management Study investigating the effects of reducing deliveries in the lower third of the High Line Canal and conveyance of that section to a recreation management entity. Aurora has expressed interest in operating most of the lower canal and helping provide canal flow to maintain the vegetation.

The Lawn Irrigation Return Flow study began in 2000 and is expected to be complete in 2004. Denver Water will enhance its supply by claiming its reusable LIRF's through a water court proceeding. Denver Water has constructed a pump station near the South Platte, which will allow it to recover bypass flows that must be released from Strontia Springs Reservoir as a regulatory condition. Denver Water customers on or near the City Ditch are being converted to the recycling plant.

Cooperative Actions. Denver Water believes it can find the additional water to build out its Combined Service Area from its own resources. That is, the Board is not dependent on resources—water rights, facilities, or dollars—from those outside its Combined Service Area to find additional water supply or demand reduction needed to meet its future obligations within the Combined Service Area. The combination of Denver Water's infrastructure and extensive conditional water rights puts it in an enviable position in terms of preparation for its future**.**

However, the Board also realizes that there may be economies and efficiencies to be gained by pooling its efforts and resources with those outside its Combined Service Area, and is willing to engage in mutually beneficial cooperative actions with those outside its Combined Service Area. The Board is not willing to permanently dedicate its infrastructure or water rights capacity to those outside its Combined Service Area without receiving yield, infrastructure or other commensurate benefit beyond payment of the costs involved.

Denver Water has been exploring cooperative actions with water suppliers outside the Combined Service Area. The following cooperative actions have been discussed or implemented within the four metro regions:

Aurora. Aurora and Denver Water are discussing potential steps for rebuilding Denver Water's Antero Dam to allow storage of the full decreed amount in the reservoir. Cooperation on the enlargement of Denver Water's Eleven Mile Reservoir also is part of the discussion. The Antero project would provide an additional 65,000 acre-feet of storage, while the Eleven Mile project could provide an added 18,000 acre-feet of storage. Preliminary steps include an engineering feasibility study, on-site environmental evaluation, an outreach program in Park County to identify crucial issues, and an assessment of probable regulatory hurdles.

Northeast**.** The northeast regional group includes Aurora, Brighton, Farmers Reservoir and Irrigation Company, South Adams County Water and Sanitation District (South Adams), Thornton, the Rocky Mountain Arsenal, and the State of Colorado. Early meetings of this group also included Public Service Company of Colorado (now Xcel Energy) and Metro Wastewater Reclamation District. Denver Water has implemented one cooperative action in this region—a three-way agreement among Denver, South Adams and the Rocky Mountain Arsenal. South Adams and Denver Water are cooperatively building 8,000 acre-feet of gravel pit storage for Denver Water's use, which will produce 5,000 acre-feet of new yield. South Adams will receive 4,000 acre-feet of this new yield, and Denver Water will

acquire the remaining 1,000 acre-feet. The Rocky Mountain Arsenal will receive 1,200 acre-feet of recycled water for the wildlife refuge. A further outcome of northeast regional efforts is an agreement between Denver Water, Farmers Reservoir and Irrigation Company, and two other irrigation companies that settled long-standing disputes surrounding the acceptability of Denver Water's reusable effluent as a replacement supply in exchanges and Denver Water's ability to use pumps at Metro Wastewater to operate exchanges.

Northwest. The northwest regional group includes Arvada, Broomfield, Consolidated Mutual and Westminster. Denver Water's first priority in this region is to solve its Moffat System problem. Denver Water and Consolidated Mutual have entered into an arrangement that provides Denver Water with 440 acre-feet of yield in exchange for Denver Water paying $3 million toward the construction of a small reservoir (Walter S. Welton Reservoir) built by Consolidated Mutual. In 1999, the Board entered into an agreement with the City of Arvada to purchase land and preserve the option to build Leyden Gulch Reservoir as a possible answer to Denver Water's Moffat reliability problem.

South Metro. The south metro group includes Douglas County, the Town of Castle Rock, Centennial Water & Sanitation District, Parker Water & Sanitation District, East Cherry Creek Valley Water & Sanitation District, Castle Pines North Metropolitan District, Cottonwood Metropolitan District, Inverness Water & Sanitation District, Stonegate Village Metropolitan District, Meridian Metropolitan District, Pinery Water & Wastewater District, Roxborough Park Metropolitan District, and Arapahoe County Water & Wastewater Authority. Denver Water, the Colorado River Water Conservation District, and the south metro entities listed above have agreed to study collaboratively possible water supply options. The expected completion date for the study is December 2003. When the study is completed, the Douglas County water users expect to prepare a cooperative action proposal for Board consideration.

***Upper Colorado River Basin Study*.** While not a part of the metro Denver regional efforts, the Board has extended its outreach to the Western Slope as well as to the Northern Colorado Water Conservancy District (Northern). On the Western Slope, Denver Water has been engaged in a four-year effort known as the Upper Colorado River Basin Study. The study includes as participants the Colorado River Water Conservation District (Colorado River District), Summit County, Grand County, the Northwest Colorado Council of Governments' "QQ Committee," the Northern Colorado Water Conservancy District, and Colorado Springs. Other interested entities, including the environmental community, have participated from time to time. The study is intended to identify current and future impacts of growth and increasing water demand on the Upper Colorado River Basin, whether from the headwater counties themselves or the Eastern Slope. That study is now moving toward the "negotiation" stage to see if mutually beneficial solutions can be found for the problems and issues identified in the study's data-gathering efforts.

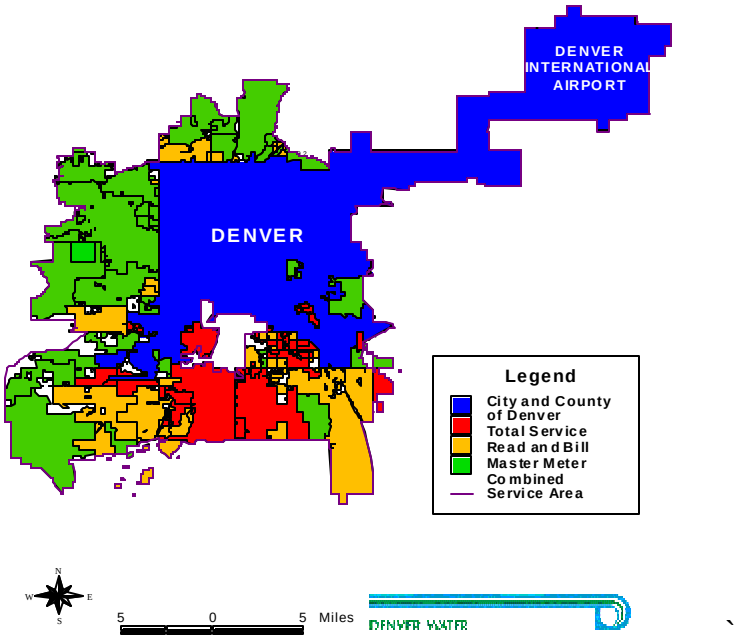
***Eagle River Basin*.** The Board has numerous water rights in Eagle County and is currently participating in a study to develop information regarding the feasibility of storing Eagle River water supplies near Wolcott, Colorado. The importance of this effort is that the east and west slopes are working together to understand how a joint use project may improve their respective water supplies. The participants in this work are the River District, Vail Consortium, Aurora and Denver Water.

The Moffat Project. Denver Water is facing an increased likelihood that it will not be able to meet its customers' water demands reliably on the north end of its system during dry periods. The reason is a water availability problem at the Moffat Water Treatment Plant. Denver Water currently has adequate water in its supply system, but not enough of that water is available for treatment at the Moffat plant.

Denver Water is examining several potential solutions for providing more water to the Moffat plant during dry years, such as enlarging Gross Reservoir; building a new off-channel reservoir; or recycling water for drinking purposes. The NEPA process for this project, being conducted by the Corps of Engineers has just begun, with the scoping completed only a few days ago. Phase II, which involves the initial screening of potential alternatives, will begin shortly.

Attachment A

Denver Water's Combined Service Area



DISCLOSURE REQUIREMENT
Committee on Resources
United States House of Representatives
December 12, 2003

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