Address to Colorado Water Congress

Thank you to the Colorado Water Congress for hosting today's meeting. Over the last year, I have visited with water leaders from across our state and continue to see the collaborative and innovative spirit that makes this community special.

When I last joined you, we asked you through Doug Kemper's nifty crowd-voting app about three priorities of our office—(1) The Colorado River Guidelines renegotiation; (2) Innovation in Water Management; and (3) Voluntary Demand Management Solutions. You ranked the importance of such priorities in that order—and suggested, in side conversations, how we can continue to serve our state in leading on water management. Thanks so much for your engagement.

Today, I will address our state's commitment to innovation in water management. At the Department of Law (as we call the Attorney General's Office), innovation is one of our four core values—we are committed, in short, to being principled public servants who are innovative and better together. As we work to follow these values, there is no greater source of inspiration for me than this community. As I have said before, the spirit of your work—including innovation and collaboration—informs and inspires not only our work on water management, but on other priorities, too, including addressing the opioid epidemic, improving our criminal justice, and protecting consumers.

Innovation runs deep in Colorado's water history, going back to 1872 when Chief Justice Moses Hallet first broke from the dominant model of the riparian system of water rights. In *Yunker v. Nichols*, he recognized that the riparian system was not well-suited to Colorado's dry climate and—due to "*the force of necessity*"—recognized an irrigator's right to divert water.[1] This started our prior appropriation system.

Fast-forward 150 years and Colorado faces new "force[s] of necessity"—explosive population growth, climate change[2], and competing uses for water. To meet today's water challenges, we must develop innovative solutions. We need to push the envelope in how we manage water and then elevate best practices and scale successful ideas.

Today, let me focus on three specific areas of water innovation: (1) increasing water supply, (2) managing demand, and (3) meeting multiple beneficial uses. I am going to highlight examples in each area that demonstrate the innovative mindset of water managers and providers across Colorado.

1. Water Supply

First, I want to discuss water supply. As detailed in the Colorado Water Plan, we face a projected total water supply-demand gap of 310,000 to 560,000 acre-feet by 2050.[3] And the effects of climate change, such as prolonged drought and variable precipitation, portend less natural snowpack and decreased yields from existing sources.[4] Faced with this challenge, we are seeing a range of innovative responses take shape.

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[1] Yunker v. Nichols, 1 Colo. 551, 556 (1872).
[2] *See* Jeff Lukas, *Climate Change in Colorado: Recent Trends, Future Projections and Impacts*: *An Update to the Executive Summary of the 2014 Report*, WESTERN WATER ASSESSMENT (Aug. 2018), https://wwa.colorado.edu/climate/co2014report/ExecSummary_Climate_Change_CO_Report_update_August2018.pdf.
[3] Colorado Water Plan at 6-18.
[4] Colorado Water Plan at 4-11.

Consider, for example, how Aurora is approaching the need for more sources of water. As a growing city, Aurora recognizes that it must continue to identify sustainable sources of water to meet rising demands. That's what drove the City to acquire the water rights of the London Mine, a gold mine in Alma, from MineWater in 2018. Through this creative partnership, Aurora purchased 1,411-acre feet of water that gets pumped from a contained basin below the mine, thereby bypassing contaminated mine infrastructure, into South Mosquito Creek for delivery to Aurora.[5] The London Mine Project is truly a win-win-win. It provides "non-tributary" water that can be reused and recaptured through Aurora's Prairie Waters System, reduces the water table in the mine to protect against contamination from the polluted site, and increases stream flows that benefit the ecosystem.[6]

In Colorado Springs, the water utility is taking a leadership role in pushing for more aggressive water re-use strategies. It has launched a Direct Potable Reuse Demonstration Project—collaborating with the School of Mines—to develop strategies for reusing wastewater while keeping the maximum amount of water in streams. When I was in Israel recently, I learned more about that country's internationally-recognized leadership in this area, which, like Colorado, is born of necessity. I am looking forward to continuing to learn from best practices around the world and supporting Colorado's leadership internationally.

In line with the tremendous collaboration in this community, another form of innovation is how water infrastructure and supply are shared creatively between different users. Consider, for example, how the South Metro Water Supply Authority formed a path-marking regional partnership called WISE, which will give Douglas County entities an option to buy excess water from Denver and Aurora (delivered via the Prairie Waters pipeline). This successful example of sharing infrastructure and excess resources is a promising development that is likely to be followed in other regions.

2. Managing Variable Demands

Let me now turn to managing demands. Our office's agenda includes helping the State evaluate the feasibility of Demand Management—as it has come to be known—in the Colorado River Basin. Yesterday's workshop was just one example of how we are supporting the Colorado Water Conservation Board and Colorado Commissioner's efforts to evaluate the feasibility of demand management.

The concept of managing variable access to water also includes working with communities and conservation districts to identify flexibility in existing laws to meet variable demands. As the Colorado Water Plan makes plain, the permanent loss of agricultural land through wholesale "buy-and-dry" strategies—such as we witnessed in Crowley County—is not a viable option going forward. Such strategies threaten to decimate rural economies, undermine our food security, and degrade Colorado's cultural identity as an agricultural state.[7] By contrast, alternative transfer methods (ATMs) promise to protect these agricultural interests while helping municipalities meet growing demands. To provide some context for this development, let me highlight two projects that are using ATMs to prevent the threat of involuntary curtailment (or "calls") on both the Colorado River and Yampa River.

As you all are well aware, climate scientists are predicting that flows on the Colorado River will decrease by 20 percent by 2050 as compared to the prior century, increasing the risk of curtailment to the

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[5] *London Mine Water Rights*, AURORAGOV.ORG, https://www.auroragov.org/residents/water/water_system/water_sources/london_mine_water_rights (last visited Nov. 25, 2019).
[6] *Id.*
[7] Colorado Water Plan at 6-115.

Upper Colorado River Basin States under the Colorado River Compact.[8] Driven by a commitment to plan ahead, the Grand Valley Water Users Association partnered with The Nature Conservancy to compensate water users for agreeing to fallow specified acreage in return for compensation. In its pilot irrigation season, the program resulted in approximately 3,200 acre feet of consumptive water savings along with $315,710 in secondary benefits—such as increased hydropower production, improved recreation opportunities, and reduced costs for salinity mitigation and endangered fish programs.

In 2018, for the first time ever, there was a "call" on the Yampa River, reflecting the impact of rising temperatures and increased droughts. In response, several local stakeholders joined together in a coalition to create an endowment specifically designed to keep the Yampa flowing. The goal of the Yampa River Fund is to reach an endowment of $5 million by 2021 to put towards two granting cycles each year for leasing water rights. These leases will improve flow in the river, keeping the river at a healthy temperature, moving sediment down the river, and allowing water users some breathing room when there is a "call" on the river.[9]

As I highlight the realities of water management in a changing environment, it is worth noting that a range of innovations will be necessary to improve how all users manage their water consumption. Consider, for example, Mammoth Water's TAPP H2O application, which provides farmers with an opportunity to more closely monitor their water use. Notably, the company behind this application was a recent participant in the Nature Conservancy-Techstars Accelerator headquartered here in Colorado.[10] Similarly, an Israeli company supported by the Israel Colorado Innovation Fund (Viridix) has developed a sensor that can monitor the soil and enable farmers to better manage their water use, even testing different strategies for how they can use less water or gain greater yields using the same amount of water.

Moving further up the chain, NASA has developed an Airborne Snow Observatory (ASO) to measure snow depth in the high country with remote-sensing lasers, providing precise prediction about snowmelt and run-off levels as well as affording users advance visibility on water levels. Last year, this technology enabled Denver Water to better manage its use of Dillon Reservoir, recognizing that there was additional water available that was not captured by the traditional SNOTEL sites.[11] Going forward, we must continue to improve how we monitor water supplies, enabling better water management decisions by irrigators, municipalities, and conservation entities alike.

3. Other Strategies

Let me address a number of other emerging strategies, including how innovation in water management relates to Colorado's outdoor recreation industry. As you are aware, how we manage our water has a direct impact on recreation, fish passage, and river health.

Though the Upper Arkansas River is "one of the most recreated stretches of river in the U.S. and is a Gold Medal Trout Fishery," the Arkansas River Diversion between Granite and Buena Vista forced

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[8] Anne Castle & John Fleck, *The Risk of Curtailment under the Colorado River Compact* (Nov. 8, 2019).
[9] *Yampa River Fund*, THE NATURE CONSERVANCY, https://www.nature.org/en-us/about-us/where-we-work/united-states/colorado/stories-in-colorado/yampa-river-fund/ (Aug. 29, 2019).
[10] https://mammothwater.com/2019/techstars-sustainability-accelerator/

[11] Cathy Proctor, *Using high-tech equipment in the air to measure snow on the ground*, DENVERWATERTAP.ORG, https://denverwatertap.org/2019/07/23/using-high-tech-equipment-in-the-air-to-measure-snow-on-the-ground/ (July 23, 2019).

rafters to portage their boats and blocked fish from any passage.[12] When the original Arkansas River Diversion fell into disrepair, Colorado Springs and Aurora saw an opportunity to re-design and re-envision its function. The cities hired a whitewater park designer and a design firm to craft an in-channel diversion that would accommodate boaters and fish. Along the way, they produced both numeric models and a real replica—with a boater the size of a thumb—to make sure the engineering functioned as planned before pouring any cement.[13] The new diversion is expected to open in spring 2020.

The Rio Grande Headwaters Restoration Project has long used data-driven approaches as part of its effective collaboration with ditch companies, recreationists, and water managers alike to craft projects for multiple uses. In 2001, for example, the Restoration Project conducted a study on the Rio Grande between South Fork and Alamosa that revealed multiple aspects of infrastructure in need of updating. It also recognized that, to get the projects done effectively, the Restoration Project needed to develop better relationships with the ditch companies.

Starting with the McDonald Ditch, the Project demonstrated that updating infrastructure can benefit irrigators, conservation groups, and the river—a win-win-win. Following this successful effort, other ditch companies started lining up to work with the Restoration Project. To date, the Irrigation Infrastructure Improvement Program has worked with seven ditches to replace aging diversion dams and head gates along the Rio Grande that improve diversion efficiency while meeting aquatic species management needs and improving boater safety.

On the Front Range, the Water Connection and Greenway Foundation have challenged business leaders and students alike to transform the South Platte River from singular urban dump into a multi-use recreational, cultural, scientific, and historical amenity. At the first edition of TAP-IN, they pitched urban waterway trash as a pervasive problem, challenging Denver entrepreneurs and business leaders to develop an innovative way to capture the trash before it ends up in the South Platt River.[14] As a result, they connected to a new technology offered by a start-up business, and installed 15 Gutter Bins throughout Denver, which, in just 15 months, captured 3,284 lbs of trash and pollution. And through their Clean River Design Challenge, they have invited college students to design products to capture and remove trash that is already in the river. The first prototype is already installed and is cleaning up Cherry Creek.

Finally, it is worth noting water re-use will be an important frontier for how we gain more bank from our water buck. In Israel, which like Colorado has placed a premium on innovation in water management, there are important new developments in this area. One company, Kando, for example, is finding ways to better trace what is going into wastewater treatment facilities, enabling those facilities to operate more effectively and address any misuses of them. I had the opportunity to visit this company when I was recently in Israel on a National Association of Attorneys General trip as part of what I envision will be a continuing effort to learn from best practices on water management from around the world.

In Colorado, we are innovators and collaborators at our core. That spirit is on display in our water community. At the Attorney General's Office, we share that spirit and will continue to work to implement the Colorado Water Plan in a manner that works for our entire state. Thanks for all you do and I would welcome any questions.

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[12] Jason Blevins, *Fish ladders and boat chutes part of a massive dam rebuild on the Arkansas River*, Colorado Sun (Aug. 22, 2019), https://coloradosun.com/2019/08/22/homestake-aurora-colorado-springs-arkansas-river-dam/.
[13] Jason Blevins, *Fish ladders and boat chutes part of a massive dam rebuild on the Arkansas River*, Colorado Sun (Aug. 22, 2019), https://coloradosun.com/2019/08/22/homestake-aurora-colorado-springs-arkansas-river-dam/.
[14] http://tapinco.org/colorado-source-cycle/