

**PERSPECTIVES ON NEW AND EXISTING
U.S. ARMY CORPS OF ENGINEERS
AUTHORITIES TO RESPOND TO WATER
MANAGEMENT ISSUES INCLUDING
DROUGHT AND WATER CONSERVATION**

HEARING

BEFORE THE

SUBCOMMITTEE ON TRANSPORTATION AND
INFRASTRUCTURE

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

ONE HUNDRED EIGHTEENTH CONGRESS

FIRST SESSION

MAY 16, 2023

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COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

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ARMY CORPS OF ENGINEERS AUTHORITIES
TO RESPOND TO WATER MANAGEMENT
ISSUES INCLUDING DROUGHT AND WATER
CONSERVATION**

TUESDAY, MAY 16, 2023

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The committee met, pursuant to notice, at 2:30 p.m. in room 406, Dirksen Senate Office Building, Hon. Mark Kelly (chairman of the subcommittee) presiding.

Present: Senators Kelly, Padilla, Cramer, Ricketts.

**OPENING STATEMENT OF HON. MARK KELLY,
U.S. SENATOR FROM THE STATE OF ARIZONA**

Senator KELLY. The subcommittee will come to order.

I want to welcome everyone to the first hearing of the Transportation and Infrastructure Subcommittee for the 118th Congress. This is my first hearing chairing this committee.

I want to thank my colleague, who will be with us shortly, Senator Cramer, for his partnership and assistance leading up to this hearing. I look forward to our future work together.

I also want to thank Senator Cramer's staff, I think they are here, and the EPW Committee staff, for their assistance in making today's hearing a reality.

I had the opportunity to say this to each of them right before the hearing gavelled in but I also want to again say thank you to all of our witnesses for joining us today and taking part in this important discussion.

The topic of today's hearing is an important one, understanding how the Army Corps of Engineers has been successful at responding to emerging water management challenges like drought risks in the western United States or increased flooding in the midwest, and how the Corps can be a better partner in responding to these challenges.

For Arizona, the most prominent challenge that we face today, and one I talk about on this committee all the time, is drought. Arizona and the entire western United States is in the midst of a two decade-long drought. This has put incredible strain on watersheds throughout the West.

In Arizona, this strain is seen most prominently along the Colorado River, but it is by no means the only impacted watershed. We had an unseasonably wet winter this year. We got great snow pack in the Rockies. This means we have better than usual runoff. All that is good news. It really is. We know from experience that wet winters are often followed by dry winters the next year.

We need to continue to prepare for this. Congress has already acted to take emergency actions to respond to the drought in the west. I secured \$4 billion in the Inflation Reduction Act for the Bureau of Reclamation to respond to drought conditions along the Colorado River. Already the Bureau of Reclamation has used that funding to conserve nearly 500,000 acre-feet of water on the Colorado River through some short-term water reduction agreements.

I will also note that the Gila River Indian Community and Governor Lewis stepped up here and made one of the most significant contributions in this process, agreeing to leave 125,000 acre-feet of water in Lake Mead. This helps us stop the bleeding.

We know more is needed. The name of the game in the western United States is long-term system conservation and efficiencies. Those efficiencies will limit water loss and promote better conservation.

The Bureau of Reclamation is making some investments to support these projects but this must be a whole-of-government effort. That includes the Army Corps of Engineers. That is why I worked hard in last year's WRDA to secure key provisions to help address these water supply challenges.

This included a number of things like providing new authorities to the Army Corps to respond to drought risk, to reauthorizing the tribal partnership program for 10 years. It also included requiring the Corps to study ways to better support and manage aquifer recharge efforts, and examining how installing natural features at Federal reservoirs can improve storage capacity.

I want to give Senator Cramer some credit for his work to establish a Western Water Cooperative Committee in WRDA which is going to foster more collaboration between States when addressing supply challenges in the western United States.

I look forward to hearing more from our witnesses today about how these programs and provisions are being implemented. I also hope we can explore what more needs to be done. For example, do the flood control curves established by the Army Corps, which govern how much water can be retained in all Federal reservoirs for drinking water or flood control, does it make sense, given the changing hydrology in the western United States, do those curves still make sense or should we modify them?

At a time when we do not have time or water, we do not have either to waste, is the Corps able to move quickly enough to support needed infrastructure investments in the western United States? What more can and should the Corps be doing to address invasive plant species in these rivers and in these watersheds?

I look forward to discussing all of these questions and more with our witnesses today. I am going to start with some introductions. Depending on the timing, we will see where we go next because I would like to hear from Senator Cramer for his opening remarks and some further introductions.

Let me first start with Governor Stephen Lewis. He is currently serving his third term as Governor of the Gila River Indian Community and previously served as the Community's Lieutenant Governor.

Governor Lewis was born in Sacaton on the Gila River Indian Community. He graduated from Arizona State University like my younger daughter, Claire, and pursued graduate studies at the JFK School of Government at Harvard University.

During his tenure leading the Community, Governor Lewis has developed a track record for bringing innovative solutions to water challenges on the Community. He spearheaded the development of the Community's Managed Aquifer Recharge Sites, which I have visited on multiple occasions. He restored the Community's riparian area. He has also been a key collaborative partner in the ongoing negotiations around Colorado River Conservation issues.

Governor Lewis has also spearheaded education initiatives, collaborations with the Community's veteran population and advocated for protection of the Indian Child Welfare Act, both at home and nationally.

Governor Lewis serves as Secretary for the National Congress of American Indians; he is the President of ASU's American Indian Policy Institute; he is on the Executive Board of the National Indian Gaming Association; and is on the Board of Trustees for the Heard Museum in Phoenix.

Leslie Meyers is the Associate General Manager and Chief Water Resources Executive for the Salt River Project. Ms. Meyers joined SRP in 2022 and has more than 30 years of experience with water resources management in Arizona and the southwest.

Prior to joining SRP, Ms. Meyers served as the Area Manager for the Phoenix Area Office with the Bureau of Reclamation. Ms. Meyers received her BS in Civil Engineering from Texas A&M University, and is a registered professional engineer.

Christy Plumer is the Chief Conservation Officer for the Theodore Roosevelt Conservation Partnership, or TRCP. Ms. Plumer joined TRCP in 2016 before which she worked with Solar City, the Nature Conservancy, and the Conservation Fund on issues related to Federal land and renewable energy policy.

For 7 years she worked on Capitol Hill working for former Senators John Chafee and Bob Smith, and was staff director for Senator Lincoln Chafee when was Chair of the Fisheries, Wildlife and Water Subcommittee of this committee.

Ms. Plumer has a BA in Biology and Environmental Studies from the University of Pennsylvania and an MA in Environmental Studies from Brown University.

With that, let me turn it over to it over to Senator Cramer. I said all these great things about you but you weren't here. I will turn it over to him for his opening statement and also to introduce our remaining two witnesses.

Senator Cramer.

**OPENING STATEMENT OF HON. KEVIN CRAMER,
U.S. SENATOR FROM THE STATE OF NORTH DAKOTA**

Senator CRAMER.

[Presiding.] Thank you, Chairman Kelly, for that and for the kind words you said earlier. I will verify them later.

I like this committee a lot. I like this subcommittee a lot. I enjoyed my work on it previously. As the Ranking Member with Senator Cardin, we accomplished some big things. I look forward to even bigger things with Chairman Kelly who is going to do what I just did and that is to vote on the floor.

Thank all of you witnesses for being here as well. As I said, this is a good committee. The whole committee is a good committee. This subcommittee especially, I think we have worked on some really important things together. I look forward to many more of those. I think today's hearing is a good place to start with that.

We are focused today on gathering feedback and information from stakeholders regarding new and existing authorities that enable the Corps of Engineers to respond to challenges related to drought, floods and water supply. It is amazing all those things have happened at the same time in our great big Country for some years.

Additionally, the hearing will provide an opportunity to discuss the Water Resources Development Act of 2022 and help inform future WRDA legislative action concerning water management issues.

Before we turn to that, I want make a few comments about the doctrine of cooperative federalism and the States' well-established rights regarding water management. I happen to think that the States' rights have been overlooked in lots of areas, not just water management, but it is probably as good a display of some of the imbalance that we should not see in cooperative federalism.

Regarding the western States, Congress and the courts have given clear and consistent deference to States for water allocation through the 1944 Flood Control Act and the Water Supply Act of 1958. The history matters.

Despite this, the Corps has pursued various regulatory actions over the years and decades, namely their proposed Water Supply Rule in 2016 threatening to erode western States' authority to manage water resources within their boundaries, the States' boundaries.

Cognizant of this continued State and Federal conflict over water management, Congress established the Western Water Cooperative Committee through the Water Resources Development Act of 2022. It was harder to do than I thought it would be but the committee, through this, will provide a platform of dialog for western States to work out water appropriation and other issues with the Corps. I am hopeful this committee will help bring about a more cohesive State-Federal partnership relating to water management.

This committee can serve as a first step toward improving the existing partnership to better account for States' rights and better resemble the model of cooperative federalism envisioned by Congress.

One of the things about this committee that we are forming is it recognizes two important facts. One is that water belongs to each of us when it is in our State but it belongs to all of us collectively. It also recognizes while not every State is the same, the halves of

our Country are very different. The west is different than the East. West Mississippi and West Missouri is different than east.

I am anxious to see how well the committee works and if it is going to work as well as the members of it apply themselves.

In addition, I want to also take a moment to briefly touch on the Snake Creek Embankment issue in my State. In 2007, the Corps realized they were experiencing some foundational problems with the embankment. The relief wells they put in place were not properly maintained over the years. Instead of physically fixing the problem to prevent embankment failure, the Corps decided to implement a water control plan that would limit the pool differential between Lake Sakakawea and Lake Audubon. Only people from North Dakota would know what I am saying when I do this. The State and others objected to this change as it would inhibit water supply to what is called the McClusky Canal, among other concerns.

I worked hard to secure a provision in WRDA 2020 requiring the Corps to reevaluate structural and operational alternatives to reduce risk of an embankment failure and to properly account for the economic benefits provided by the embankment. Boy, aren't there economic benefits or economic consequences if there is adequate water or not adequate water. Water is pretty critical to economic opportunity.

The Corps has since conducted a dam modification study and completed the associated draft environmental assessment earlier this year. The State and the Garrison Diversion Conservancy District have raised concerns with the Corps' recommended plan primarily as it fails to fully account for the economic impacts associated with the entire embankment. I look forward to getting into that a little bit today.

I have since communicated with General Spellman and urged the Corps to take an all-encompassing perspective on the importance of the embankment, fully recognizing its integral role in ensuring water supply to roughly 50 percent of North Dakota's population and the billions of dollars' worth of development that are on the line due to the need for consistent water supply. This issue is simply too important for the future of the State to get it wrong.

I look forward to speaking more with our witnesses and getting valuable feedback on a variety of water management issues. Thank you to all our witnesses for being here today. I know you all bring tremendous expertise and certainly a lot of local and regional understanding of the importance of this issue.

Now I get to introduce my witnesses. I call them my witnesses. You are all of our witnesses and you are all wonderful.

It is an important hearing and it is my honor to introduce as witnesses Andrea Travnicek, Director of the North Dakota Department of Water Resources and Jennifer Verleger, Chair, Western States Water Council. Thank you both for being here.

Dr. Travnicek, we call her "Trav." You all will eventually. It is easier to pronounce and spell. It is Dr. Andrea Travnicek.

She was appointed by Governor Burgum in 2021 to serve in this role as the Director of the North Dakota Department of Water Resources. She has had lots of very important roles. She oversees the

management of water resources for the State through water development, regulatory responsibilities, planning, education and safety.

Previously, Dr. Travnicek was the Director of the North Dakota Parks and Recreation Department and also worked in various roles at the United States Department of the Interior, including serving in the Water and Science Hallway. She is intimately familiar with western water issues and the impacts Federal policy has on States.

Further, Dr. Travnicek has a Ph.D. in Natural Resource Management Communication from North Dakota State University and was recently given the 2023 Horizon Award which honors NDSU graduates doing outstanding work and community service. Congratulations on that.

She certainly keeps herself busy. She testified earlier this morning at the House Transportation and Infrastructure Committee. We are grateful to have you here today.

Jennifer Verleger is testifying before this committee today as Chair of the Western States Water Council. However, she is also North Dakota's Assistant Attorney General and provides general counsel and litigation services to the North Dakota Department of Water Resources and State Water Commission, a lot of work.

Ms. Verleger has represented the State on water issues in the U.S. Supreme Court, Federal appellate courts, the North Dakota Supreme Court, State and Federal district courts and Office of Administrative Hearings in several areas including interState rivers, federalism, water rights, water appropriation, drainage, and sovereign lands. It is hard to imagine a more important legal job than that one.

Ms. Verleger sits on the National Water Supply Alliance Board and is a member of the Conference of Western Attorneys General. She has been an excellent resource to me and my staff. They talk about you a lot, Jennifer, as we have worked through water supply and water law conflicts with the court.

Thank you both, Andrea and Jennifer, for being here today. I value this opportunity to gather input from all of you and your insights. I look forward to a meaningful discussion on water management in our western States and other issues pertaining to the Corps.

Senator CRAMER. I should have read slower. Maybe the Chairman could have gotten here. We will proceed without him and he will catch up.

We are going to start with witness statements. You will each have 5 minutes. You can see the lights in front of you. It is just like driving. You know what red, yellow and green mean.

We will start with Ms. Plumer. Thank you for being here.

STATEMENT OF CHRISTY PLUMER, CHIEF CONSERVATION OFFICER, THEODORE ROOSEVELT CONSERVATION PARTNERSHIP

Ms. PLUMER. Thank you, Senator Cramer. Thank you to Chairman Kelly and other members of the subcommittee for the opportunity to testify today.

I am Christy Plumer, Chief Conservation Officer of the Theodore Roosevelt Conservation Partnership, a coalition of 63 hunting, fishing, outdoor recreation, landowner, and scientific associations that

was founded in 2002. At the TRCP, we are dedicated to ensuring the places Americans love to hunt and fish are conserved and the species upon which we depend as hunters and anglers are managed at sustainable levels.

Water conservation and Federal and State authorities related to water quantity and quality are therefore core to our mission and we work closely with Federal, State, tribal and regional partners to accelerate the pace and scale of aquatic restoration.

As a part of this effort, we host working groups through the TRCP Policy Council that bring together our organizational partners to develop, respond to, and advance water and natural infrastructure policy, and we engage with Congress on the biennial Water Resources Development Act and with the U.S. Army Corps of Engineers to implement aquatic restoration programs and authorities.

Today, I will touch on the growing water management challenges, particularly in the west, and the opportunity for the Corps and this committee to advance nature-based solutions.

The Corps plays an important but often-overlooked role in the West providing water to meet the needs of around 101 million people and supporting agricultural irrigation from 24 projects. Corps-owned facilities also provide abundant hunting, fishing and outdoor recreation opportunities in the west and across the country. Drought and wildfire, aging infrastructure and increasing levels of water demand, along with climate change, are growing challenges for the Corps.

Addressing these challenges, we believe, will require rapid deployment of nature-based solutions and natural infrastructure such as restoring wetlands and improving watershed health. The Corps has several existing tools and authorities at their disposal to scale natural infrastructure investments. One example is the Sustainable Rivers Program, a partnership with the Nature Conservancy that funds local efforts to integrate environmental flow and natural infrastructure objectives into existing Corps operations.

In southern Arizona, this program supports a partnership to design releases from the Alamo Dam on the Bill Williams River to enhance riparian areas and reduce flood risk. Another example is the Continuing Authorities Program, specifically the Section 206 Aquatic Ecosystem Restoration Authority, which provides a streamlined process for the Corps to design and implement natural infrastructure projects.

The Water Resources Development Act of 2022 includes new authorities and direction for the Corps to address drought with provisions on managed aquifer recharge, updating water control manuals in response to drought, and facilitating dialog on western water management.

We specifically appreciate Section 8208 of WRDA 2022 which directs the Corps to assess opportunities to use natural infrastructure to reduce drought and wildfire risk to Corps infrastructure in the southwest United States. This study will provide information on how natural infrastructure may be integrated into existing agency risk management and operational guidance. We encourage Congress to fully fund the study.

Looking ahead, this Congress has numerous opportunities to continue to build on existing programs and authorities to tackle drought. First, Congress should invest in the existing Drought Resilience Program to meet the outsized demand in the west, including the Sustainable Rivers Program, the Continuing Authorities Program authorities and WRDA 2022 drought-focused provisions.

Second, Congress should strengthen technical assistance. The Silver Jackets Program is one successful model for flood risk management and should be expanded to address drought.

Third, Congress should encourage the Corps to enhance cross-boundary partnerships with Federal land management agencies and non-Federal partners.

Fourth, Congress should consider directing the Corps to update their benefit cost analysis process to account for the multiple benefits of natural and nature-based infrastructure.

Finally, on the topic of hunting and fishing access, Congress should enable the Corps to invest in recreational infrastructure through the bipartisan LAKES Act, spearheaded by Senator Cramer, thank you, and Senators Heinrich and Padilla.

In closing, we stand ready to work with this subcommittee and the full committee, Congress and the Corps to advance these fish and wildlife-focused solutions. Once again, thank you, Chairman Kelly and Ranking Member Cramer, for holding this important hearing today. I look forward to answering your questions.

[The prepared statement of Ms. Plumer follows:]

**Testimony of Christy Plumer
Chief Conservation Officer, Theodore Roosevelt Conservation Partnership**

**Senate Environment and Public Works Committee
Subcommittee on Transportation and Infrastructure**

**“Perspectives on New and Existing US Army Corps of Engineers Authorities to Respond to
Water Management Issues including Drought and Water Conservation”**

May 16th, 2023

Good afternoon, Chairman Kelly, Ranking Member Cramer, and members of the Subcommittee. I appreciate the opportunity to represent the Theodore Roosevelt Conservation Partnership (TRCP) at today’s hearing. I am Christy Plumer and I serve as the Chief Conservation Officer of the Theodore Roosevelt Conservation Partnership, a coalition of 63 hunting, fishing, outdoor recreation, landowner, and scientific organizations that was founded in 2002. At the TRCP, we are dedicated to ensuring the places Americans love to hunt and fish are conserved and the species upon which we depend as hunters and anglers are managed at sustainable levels. Water conservation and federal and state authorities related to water quantity and quality are therefore core to our mission and we work closely with federal, state, tribal and regional partners to accelerate the pace and scale of aquatic restoration. As a part of this effort, we host working groups through the TRCP Policy Council that bring together our organizational partners to develop, respond to, and advance water and natural infrastructure policy and we engage with Congress on the biennial Water Resources Development Act (WRDA) and with the U.S. Army Corps of Engineers (USACE; Corps) to implement aquatic restoration programs and authorities.

Today, I will touch on the Corps’ growing water management challenges, particularly in the West, and the opportunities we believe the Corps has to advance solutions that benefit fish and wildlife.

Growing Water Management Challenges for the U.S. Army Corps of Engineers

The USACE has a central role to play in responding to the variety of water management challenges in the United States. The USACE has 136 multi-purpose reservoirs that store water supplies in 26 states. These projects provide nearly 10-million acre-feet of water supply storage for municipal and industrial use, sufficient to meet the indoor household needs of 101 million people. The USACE also provides irrigation water to western farmers who steward millions of acres of land, with approximately 480,000 acre-feet of storage in 24 projects in the western United States. Aside from water management, USACE-owned facilities also provide access to a wide variety of hunting, fishing, and outdoor recreation opportunities.

Steadily increasing demands for limited supplies of water, interstate conflicts over water use, pressures from drought and wildfire, and aging infrastructure all present growing challenges to water management at Corps reservoirs and facilities. In the western United States, the increasing severity and duration of drought and wildfire are already having significant impacts on USACE infrastructure, assets, and the people and places that rely upon them. Wildfires damage

watersheds in part by reducing infiltration rates and increasing runoff, thereby destabilizing stream channels and increasing sedimentation, which in turn reduces storage capacity. For example, the 2011 Las Conchas wildfire in New Mexico resulted in rapid and massive flooding in the burned areas directly upstream of Cochiti Reservoir, which is managed by the USACE for flood control, sediment control, recreation, and wildlife. As a result, the reservoir experienced increased sedimentation rates far above its historical averages, affecting reservoir operations and increasing costs. Climate change compounds many of these water management challenges. For example, hotter and drier conditions slow the re-establishment of vegetation on burn scars, extending the post-fire sediment and flood impacts.

With days and weeks at a time spent afield, hunters and anglers are often the first to witness the impacts that climate change has on our natural resources, including changes in migration patterns, altered breeding seasons, shifts in home ranges, and loss of habitat from sea level rise, drought, or invasive species encroachment. Recent polling by the TRCP suggests most hunters and anglers think that climate change is happening and, further, that human activity is affecting our climate. They also believe human activity can be a part of the solution. This is why the TRCP is working on nature-based solutions that deliver climate resilience while enabling our lands and waters to adapt to our changing climate.

The Role of Nature-Based Solutions and Natural Infrastructure

Nature-based solutions, or natural infrastructure approaches, can help address many water management challenges. Simply put, natural infrastructure is a natural or man-made system that is intentionally managed or restored to provide multiple co-benefits for people and the environment. Such activities also mitigate the effects of climate change by reducing erosion, reducing wildfire severity, cooling stream temperatures, and improving water quantity and quality. Natural infrastructure approaches lead to healthy habitats that can absorb and store carbon. For example, restored wetlands and floodplains store between [81 to 216 metric tons of carbon per acre, depending on their type and location](#). Natural infrastructure approaches also generate economic benefits by enhancing outdoor recreation opportunities and creating jobs.

Natural infrastructure can maintain the resilience of built infrastructure, such as reservoirs, as well. For example, forested watersheds are the source water for several major river systems in the country, including the Colorado River, Upper Missouri, Rio Grande, and the Sacramento-San Joaquin. In some cases, forested watersheds have been degraded by human activities, such as fire suppression and a patchwork of development, and can pose a risk to downstream Corps facilities. Restoration and conservation of source watersheds is a natural infrastructure approach and proven tool that can reduce risks from catastrophic wildfire and mitigate damage from sedimentation and flood events.

The USACE itself has recently acknowledged the importance and promise of natural infrastructure solutions. For example, the [USACE Climate Action Plan](#) recognizes climate change may require solutions beyond traditional approaches, such as the adoption and integration of natural infrastructure. On July 28, 2022, the USACE issued a memorandum on [Army Civil Works Supporting Drought Resilience in America's Communities](#) that emphasized the need for

the USACE to apply its capabilities to build drought resilience across the nation, including through aquatic ecosystem restoration activities.

Thus, there is a clear opportunity to rapidly accelerate the pace and scale of natural infrastructure deployment at the Corps in the years ahead. While additional research may be needed on design considerations and coordination with reservoir operations, existing USACE authorities and programs are already set up to help and Congress has an opportunity to build on this work in the next WRDA.

Existing Programs and Authorities

The USACE has several programs, authorities, and initiatives that already advance natural infrastructure solutions to address the growing water management challenges across the country.

- The **Sustainable Rivers Program (SRP)**, which is a partnership between USACE and the Nature Conservancy (TNC), aims to incorporate environmental objectives, such as environmental flows and habitat, into operating plans for USACE dams and infrastructure. To date, 44 rivers encompassing more than 12,000 river miles have been enrolled in SRP, two of which are in Arizona. In the Bill Williams River, the USACE, TNC, Arizona Game & Fish, and other partners are working to plan releases from Alamo Dam designed to meet a variety of natural resource objectives, including enhancing riparian areas, and reducing flood risk. The SRP in the Gila River at Painted Rock Dam started in FY22, and USACE and state agencies are currently developing plans for wetland features that provide access to water resources for wildlife.
- The **Continuing Authorities Program (CAP)** is a set of nine authorities through which the Corps can provide a streamlined process to support non-federal partners in designing and implementing water resource projects without obtaining project-specific authorizations. Several of the authorities, such as Section 206 Aquatic Ecosystem Restoration projects, provide explicit support for investments in natural infrastructure. CAPs also provide favorable cost-sharing provisions, allowing more types of partners access to Corps' resources.
- The **Engineering With Nature Initiative (EWN)** was established in 2010 to “enable more sustainable delivery of economic, social, and environmental benefits associated with infrastructure.” The EWN leverages funding with partners to evaluate natural infrastructure approaches that can reduce natural hazard risks. For example, the use of the EWN in the Missouri River led the Corps to set back a levee to stop the repetitive and costly cycle of repairing certain damaged levees after a major flood event. This led to reduced federal costs, while also reconnecting over 1000 acres of floodplain, providing important habitat in a key migratory bird flyway.

While these programs are valuable, many of the existing USACE natural infrastructure efforts are focused on addressing coastal and inland flooding. Less energy had been invested into how USACE can utilize strategic investments in natural infrastructure to address water supply challenges in the West. Nonetheless, Congress has recognized the value of USACE's involvement and has charged the Corps to take on even greater responsibilities to address drought through recent legislation.

- **Water Resources Development Act of 2022:** The Water Resources Development Act of 2022 (WRDA 2022) included numerous water conservation and drought provisions. For example, it included language on studying managed aquifer recharge at Corps projects (Sec. 8107), updating water control manuals in response to drought (Sec. 8109), facilitating dialogue on western water management (Sec. 8158), and it makes permanent the authority of the Corps to evaluate and approve water supply conservation measures (Sec. 8107). One of the most important provisions to the TRCP is Section 8208, requiring the USACE to study the use of natural infrastructure activities in the South Pacific Division, which contains several major western watersheds. This study is expected to include analysis of the effectiveness of various natural infrastructure activities at or upstream of Corps reservoirs, for the purposes of sustaining operations, mitigating risk, and increasing water supply. The study should provide information on how natural infrastructure may be further integrated into existing agency risk management and operational guidance and highlight areas for further research and demonstration.
- **Bipartisan Infrastructure Law:** The Bipartisan Infrastructure Law (BIL) has also been instrumental for the USACE to continue to tackle water management challenges in the West related to drought and water conservation. Notably, thanks to BIL, the USACE is now working with state and federal agencies to enhance soil moisture monitoring and snowpack monitoring stations in the Upper Missouri River Basin to inform drought planning and response. The USACE has allocated an additional \$70 million in FY22 to support water conservation and reuse efforts, including providing funding for a reclaimed water project in Arizona and brackish water desalination in California.

The TRCP and our partners look forward to working with USACE and Congress to implement these programs, authorities, and investments.

Opportunities to Enhance USACE Water Management

The BIL, Inflation Reduction Act (IRA), and WRDA 2022 all provide tools to improve water management to address drought, wildfire, and water conservation. As Congress looks ahead to the next WRDA, annual appropriations, and other legislative vehicles, we believe the following recommendations would build on the good work already taking place at the Corps to build drought resilience, enhance fish and wildlife habitat, and improve access.

1. Expand USACE Authorities and Funding for Drought Resilience

A lack of consistent funding is a significant barrier to accelerating the pace and scale of natural infrastructure and drought resilience projects. The CAP frequently receives significantly less funding than their annual authorizations despite outsized demand for the program. Similarly, while the SRP has recently received increased appropriations, demand outpaces funding with only 40% of district office requests funded last year. Steadily growing funding for both CAP and SRP will help USACE develop new science-based and natural infrastructure solutions for dealing with climate change and drought. Congress should also fully fund Sec. 8208 of WRDA 2022, which will provide a framework for the approval of feasibility studies and projects that implement natural infrastructure approaches to maximize drought benefits.

2. Improve Interagency Partnerships and Planning

Given the USACE's role in managing water, and the role of federal land management agencies in the West, the USACE should engage in interagency efforts to develop and implement source water protection plans when USACE owned reservoirs, dams, and associated recreational facilities may be at risk. For example, the U.S. Forest Service (USFS) is currently investing BIL and IRA dollars in forest and watershed restoration to reduce risks associated with wildfire. The USACE should consider working with the USFS and other land management agencies and Tribes to coordinate BIL and IRA investments in places critical to protecting Corps-owned infrastructure. Such activities should complement other USACE planning efforts, including regional sediment management plans.

Congress should also consider other ways to encourage the USACE to work with non-federal partners. One example is the expansion of Good Neighbor Authority (GNA) to the Corps. While the GNA is currently utilized by the USFS and Bureau of Land Management, no such authority exists for the USACE. WRDA 2022 took a step in this direction by requiring the Corps to determine whether the use of good neighbor agreements on USACE lands for forest, rangeland, and watershed restoration activities would be in the interests of the country.

3. Strengthen Technical Assistance Programs

Entities seeking federal funding have challenges navigating federal opportunities, locating adequate match, and covering pre-project engineering and design costs. These challenges are particularly acute in rural and historically underserved areas. WRDA 2022 included provisions that expanded programs to help Tribes and underserved communities access Corps resources, and Congress should consider building on this work in the future.

One key technical assistance initiative is the USACE's Silver Jackets program, which supports state-led flood risk management teams working at a watershed-scale to advance aquatic ecosystem restoration, floodplain management, vulnerability assessments, and community planning. The TRCP and our partners strongly support this important program and encourage Congress to consider providing dedicated funding and expanding its purposes beyond flooding to encompass a full range of natural hazards, including drought. Congress should also consider directing the Corps to initiate a community navigator program, which could provide funding to non-federal entities to build local capacity by hiring project coordinators to work with communities and water users to build pipelines of multi-benefit natural infrastructure projects and connect these projects to federal and state funding opportunities.

4. Properly Account for Natural Infrastructure Project Costs and Benefits

The Corps' benefit-cost analyses continue to, in many cases, disregard benefits provided by natural systems, leading to benefit-cost ratios (BCR) that do not provide a reliable assessment of whether a project is in the Federal interest. Further, the Corps too often recommends projects for authorization and funding based solely on the project's BCR, rather than utilizing the BCR as one among many decision-making tools. The Corps' utilization of its current benefit-cost structure too often tilts the scales toward large-scale structural projects that leave fish and

wildlife habitat considerations and underserved communities behind. As climate risks increase, it will be imperative for the Corps to ensure its benefit-cost analyses account for the social, economic, and ecosystem benefits of natural and nature-based infrastructure measures to better integrate these solutions into Corps projects moving forward. Therefore, Congress should consider directing the Corps to account for the multiple benefits of natural and nature-based infrastructure through a full-scale update of the Corps' benefit-cost analyses process. This update should, among other things: equitably account for costs and benefits to disadvantaged and low-income communities; count lost ecosystem services as project costs and increases in ecosystem services as project benefits; and include costs associated with full life-cycle project needs including structural project failure over time versus the benefit of natural system integration. These changes will protect taxpayers, help non-federal sponsors, and enable the Corps to fulfill its mission more effectively.

5. Support Recreational Access

The Corps provides hunting and fishing access to millions of Americans across the country and manages recreation infrastructure assets on scale with the National Park Service, U.S. Fish and Wildlife Service, and the USFS. While these other federal agencies can retain a portion of recreation fee revenue to reinvest in recreation infrastructure, the Corps does not have such authority and its recreation program remains historically underfunded. We applaud Ranking Member Cramer's leadership to introduce the bipartisan LAKES Act, which would extend recreation fee retention authority to the Corps and make needed reforms to their existing joint management authority to support our hunting and fishing access, and our outdoor economy.

Access remains a top priority for the TRCP. Last Congress, we worked extensively on the MAPLand Act (P.L. 17-114), which directed several federal agencies including the Corps to digitize information about recreational access on federal lands. That bill, however, did not address the federal rules and regulations that govern the public's ability to access, recreate on, and navigate federal waterways. Congress and the Corps should consider how to create, standardize, and disseminate geospatial information related to waterway restrictions, fishing restrictions, and access locations. Such efforts would improve public access and safety, reduce conflict and resource damage, and lower barriers to entry for water-based recreation.

Conclusion

In closing, I would like to thank Chairman Kelly, Ranking Member Cramer, and the members of the Committee for calling attention to the key role the Corps plays in managing water supplies and addressing drought. The TRCP and the hunting and fishing community stand ready to work with the Corps and Congress to advance fish and wildlife habitat focused solutions to the water supply and drought challenges in the West.

Senator KELLY.
[Presiding.] Thank you, Ms. Plumer.
Ms. Meyers.

STATEMENT OF LESLIE A. MEYERS, P.E., CHIEF WATER EXECUTIVE, AND ASSOCIATE GENERAL MANAGER OF WATER RESOURCES, SALT RIVER PROJECT

Ms. MEYERS. Thank you, Chairman Kelly. Good afternoon Ranking Member Cramer.

I am Leslie Meyers, Associate General Manager for Water Resources at the Salt River Project. Thank you for inviting me today to provide testimony on how we can improve our ability to respond to water management challenges using existing and potential new authorities. It is a privilege to share my insight and observations with you.

SRP has been serving Arizona since 1903, almost 10 years before Arizona became the 48th State. We are the third largest not-for-profit community-based public power entity in the country providing sustainable, reliable and affordable electricity to nearly 3 million people.

SRP is also the largest supplier of raw water in the Phoenix Metropolitan area, delivering about 800,000-acre-feet annually from the Salt and Verde Rivers to municipal, industrial and agricultural customers.

SRP manages and operates seven dams and reservoirs that can store approximately 2.3 million-acre-feet of water as well as 1,300 miles of canals, lateral stitches, and pipelines.

Roosevelt Dam was authorized as one of the first projects in the 1902 Reclamation Act. In 1905, Reclamation began construction on Roosevelt Dam 40 miles northeast of Phoenix, which it completed in 1911. SRP has operated and managed the dam for over 100 years.

The U.S. constructed Roosevelt Dam as a water storage and power generation facility and it remains a critical source of stored water and hydroelectric power generation today. Reclamation undertook several significant modifications to the dam in the 1990's raising it 77 feet in elevation, adding 550,000 acre-feet of dedicated flood control space, 1.2 million acre-feet of safety of dam surcharge capacity, and increasing water conservation storage capacity by about 280,000 acre-feet.

The flood control space is under the jurisdiction of the Corps of Engineers under Section 7 of the Flood Control Act of 1944. The Corps of Engineers, Reclamation and SRP developed a flood control plan in 1997 that requires that SRP evacuate water within 20 days of it first entering the flood control space.

While the Flood Control Manual ensures that SRP can operate the dam safely under the most extreme flood events, it also requires SRP to evacuate water during small and moderate flood events, something we are working with the Corps of Engineers and Reclamation to revise.

The 2006 and 2020 Water Resources Development Acts included provisions authorizing the Corps of Engineers to accept funds from non-Federal entities to review flood operating plans at Reclamation facilities with dedicated flood control space like Roosevelt Dam.

Since Congress enacted these provisions, SRP, along with 14 tribal, agricultural, industrial, and municipal partners, were funding a coordinated effort with the Corps and Reclamation to review the flood control plan. This review resulted in our proposal to temporarily extend the release period in the bottom 20 percent of the flood control space from 20 to 120 days in certain years. Engineers from both the Corps of Engineers and Reclamation concluded that the proposal was safe or risk neutral.

This type of cross-sectional public-private partnership is a great example of what it will take to maintain resilient water supplies in the future. The Federal and non-Federal partners work together to improve water management while maintaining the safety and integrity of our critical dam infrastructure.

If approved, this proposal could make up to 109,000-acre feet of flood water annually available for use in three of the next 5 years. Put in perspective, this amount of water can support the annual needs of roughly 330,000 households in the Phoenix metropolitan area.

The Salt and Verde Rivers are highly variable river systems and we anticipate that the changing climate will produce increasingly variable annual flows. Projections predict a hotter, drier climate that has higher variability in river flows, including wetter wet periods and sharper, deeper drought periods.

The Salt and Verde River systems experienced significant runoff this season and water rose 6 feet into the flood control space. If the proposed changes to the flood control plan were in place, SRP would have been able to reduce the flood releases by 109,000 acre-feet.

Thank you, Chairman Kelly and Ranking Member Cramer for this opportunity to testify today. I look forward to answering your questions.

[The prepared statement of Ms. Meyers follows:]

**Leslie A. Meyers
Associate General Manager**

Salt River Project

**Testimony before the Senate Committee on Environment and Public Works, Subcommittee
on Transportation and Infrastructure**

on

**“Perspectives on New and Existing US Army Corps of Engineers Authorities to respond to
Water Management Issues including drought and water conservation”**

2:30pm, May 16th, 2023

Chairman Kelly, Ranking Member Cramer and members of the Subcommittee, my name is Leslie Meyers and I am the Associate General Manager and Chief Water Executive at Salt River Project (SRP). Thank you for the opportunity to testify today on opportunities for new and existing U.S. Army Corps of Engineers (USACE) Authorities to respond to water management issues, including drought and water conservation. SRP has a long history of working with tribal, local, state, and federal government entities to find water management solutions, including working closely with USACE, the Bureau of Reclamation (Reclamation) and other federal agencies.

The Salt River Project

SRP was formed at the turn of the 20th century to contract with the federal government for the construction of Theodore Roosevelt Dam, and other components of the Salt River Federal Reclamation Project. SRP manages and operates seven dams and reservoirs throughout Arizona, 1,300 miles of canals, laterals, ditches, and pipelines to deliver water to approximately 250,000 acres of land in the greater Phoenix area. The dam and reservoir system can store approximately 2.3 million acre-feet (AF) of water runoff from the Salt and Verde rivers and East Clear creek systems.

SRP is the third largest not-for-profit community based public power entity in the country, providing sustainable, reliable, and affordable electricity to nearly 3,000,000 people in Arizona. SRP is also the largest raw water provider in the Phoenix Metropolitan area.

History of Theodore Roosevelt Dam

Theodore Roosevelt Dam (Roosevelt Dam) was originally constructed as a water storage and power generation facility that remains a critical source of stored water for irrigation, municipal and industrial uses, and hydroelectric power generation to the Phoenix Metropolitan areas since its completion in 1911. Reclamation undertook a \$430 million modification project on the dam from 1989-1996, raising it 77 feet in elevation and creating three distinct storage pools as shown in Figure 1. The modification increased the water conservation storage capacity by 20%, added 556,000 AF of dedicated flood control space (FCS), and 1,220,000 AF of Safety of Dams (SOD) surcharge capacity to address dam safety concerns identified by analysis of the potential probable maximum flood within the Salt River basin. Roosevelt Dam is owned by Reclamation, operated by SRP, and the FCS is under the jurisdiction of the USACE in accordance with Section 7 of the 1944 Flood Control Act. The current flood control plan for the FCS requires that SRP evacuate water entering the FCS within 20 days. These operating criteria are described in the USACE Water Control Manual (WCM) for Roosevelt Dam and have remained unchanged since 1997.

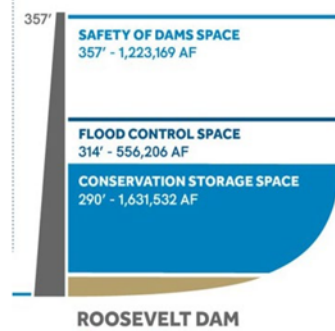


Figure 1. Dedicated Storage Spaces within Roosevelt Dam

The dedicated FCS and SOD capacity within Roosevelt Dam have been important federal investments to protect the robust downstream economy of America's fifth largest city and support the management of reliable water supplies. SRP, Reclamation, and USACE have proven to be strong partners with an ability to coordinate effectively. However, operating a multi-purpose reservoir under two federal jurisdictions presents challenges. As SRP prepares its water storage and delivery system and operating plans for an increasingly variable water future and

the effects of climate change, efficient coordination and decision-making with our federal partners will only become more important.

Need for System and Operational Flexibility

Studies anticipate the Salt and Verde rivers will produce increasingly variable annual flows for two already highly variable river systems. Projections predict a hotter and drier climate that has higher variability in river flows, including wetter wet periods and sharper, deeper drought periods. This variability requires that SRP prepare to adapt its operations quickly from drought conditions to very wet conditions. At the same time, future reductions and variability in the availability of Colorado River water brought to central Arizona through the Central Arizona Project canal creates a need to use all water available on the Salt and Verde rivers effectively. Figure 2 shows SRP Water Service Area (WSA) relative to the boundaries of the cities in the Phoenix Metropolitan area. The areas outside of SRP’s WSA are primarily dependent on the Colorado River, requiring water providers to plan back-up supplies for years when Colorado River supplies are reduced or unavailable. The water supplies made available by improved operational flexibility within the Roosevelt Dam FCS is eligible for use outside SRP’s WSA and will be used to help water providers in central Arizona back up water supplies from the Colorado River in shortage years.

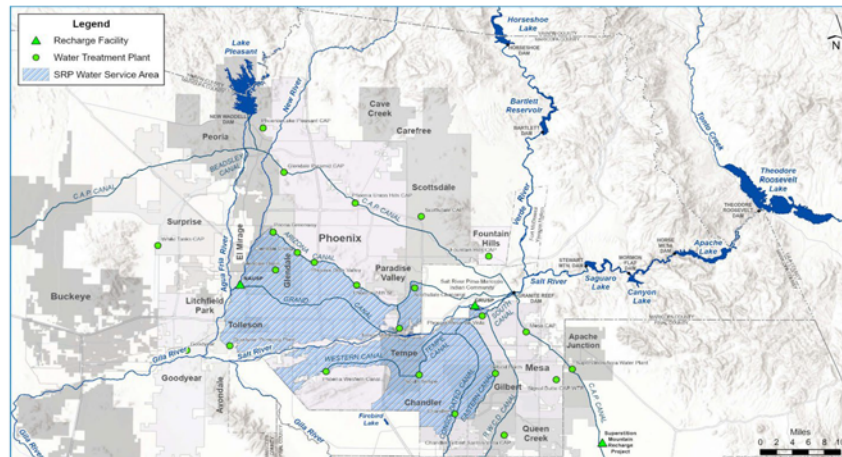


Figure 2. Phoenix Area Water Supplies and SRP Water Service Area

The flood control plan described in the Roosevelt Dam WCM ensures that SRP can operate the dam safely under the most extreme flood events that could occur on the Salt River. However, the plan also requires SRP to unnecessarily sacrifice water that could be put to use

under small and moderate flood conditions. Increased operational flexibility and effective multi-agency coordination will be increasingly important for maintaining safety while carefully managing our precious water supplies.

Existing USACE Authorities to Support Operational Flexibility

SRP appreciates the direction Congress provided in Section 1118 of the Water Resources Development Act (WRDA) of 2016, which authorized USACE to accept non-federal funds from non-federal entities to collaborate with such entities to review flood operating plans to improve water management, while maintaining flood and dam safety. Roosevelt Dam, with its decades old WCM, is a prime example of a facility that can benefit from revisiting the flood operating plans to optimize our ability to manage water supplies without sacrificing flood management or dam safety. The forward-looking authorities Congress provided USACE in WRDA 2016 are great examples of what will be necessary for the West to adapt to changing climate conditions.

In SRP's experience, both USACE and Reclamation are collaborative federal agencies that strive to fulfill their congressionally directed missions. Both agencies have similar, yet distinct missions that are not always in alignment. In addition, their authorities do not always mesh to facilitate effective management of western river systems. A great example of necessary congressional intervention to ensure that USACE and Reclamation authorities work in concert came in Section 162 of WRDA 2020. Section 162 supplemented the authorities provided in Section 1118 of WRDA 2016¹ to ensure that the authorities are applicable at facilities like Roosevelt Dam that are not owned by USACE but have dedicated FCS under the jurisdiction of USACE in accordance with Section 7 of the Flood Control Act of 1944.

Benefits of Increased Operational Flexibility at Roosevelt Dam

The current WCM requires that SRP evacuate water entering the FCS within 20 days, regardless of the size of flood event. Since Congress passed the clarifying authorities in WRDA 2020, SRP, along with 14 tribal, agricultural, industrial, and municipal partners are funding a coordinated effort with Reclamation and USACE to review the WCM to modify flood control plans. The areas of water use for the 14 partners is shown on the purple lands in Figure 3.

¹ Section 1118 WRDA 2016 authorized the Secretary of the Army to review proposals from a non-federal interest to increase the quantity of available supplies of water at a "Federal water resources development project". Through its Section 1118 WRDA 2016 implementation guidance and effects statement, the USACE interpreted Section 1118 as excluding dams not constructed by the USACE.

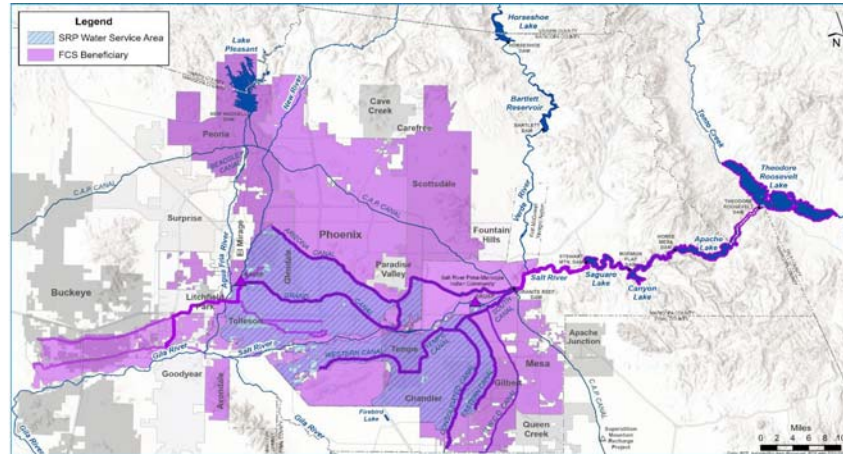


Figure 3. Areas of Use for Roosevelt FCS Beneficiaries

The review of the current WCM has resulted in a proposal from these non-federal partners to extend the release period in the bottom 20% of the FCS from 20 days to 120 days. The USACE and Reclamation engineers have reviewed the proposal which does not require any structural modifications or new infrastructure, and deemed it risk neutral from a dam and flood safety perspective. The USACE is currently reviewing the environmental impacts of the proposal and a decision is expected in late 2023. If approved, the proposal will allow SRP to modify flood operations in the FCS increasing the non-federal partners' ability to use up-to 109,000 AF of flood water through calendar year 2029. Put into perspective, such use has the potential to support the annual needs of roughly 330,000 households in the Phoenix Metropolitan area.

The 2023 run-off season serves as a great example of why the 14 non-federal partners are working with USACE and Reclamation to improve operational flexibility for flood events at Roosevelt Dam. To date, the Salt and Verde rivers have produced more than 400% above normal inflows for the 2023 run-off season. This is compared to one of the driest observed winter run-off seasons in 2022.

As a result of the large 2023 run-off season, Roosevelt Dam entered the FCS in mid-March. SRP evacuated the FCS within 20 days in accordance with the existing flood control plan causing 318,887 AF of water from the Salt River to be evacuated and go unused—that's more water than the total combined run-off observed on the Verde and Salt rivers in the 2022 run-off season.

If the proposed changes in operations could have been implemented this year, 109,000 AF of water could have been conserved for use in homes, agricultural fields, and businesses that SRP otherwise evacuated from the Roosevelt Dam FCS under the WCM. When the spring flood conditions became apparent, SRP worked with Reclamation and USACE to determine if any options existed to fast-track improved operational flexibility this year. After careful review and coordination, we determined we could not complete environmental reviews to authorize the revised operation before the flood events concluded.

Opportunities for New and Expanded USACE Authorities

Several opportunities exist to improve water management and climate change adaptation through new and expanded USACE authorities. First, care should be given when developing legislation to consider the applicability to dams like Roosevelt Dam that are not owned by USACE but have dedicated FCS subject to USACE regulation under Section 7 of the Flood Control Act of 1944. In western states where both Reclamation and USACE have roles in water management, special attention should be given in developing and revising authorities that help the agencies complement each other in order to help improve efficiency of flood control plans while maintaining flood and dam safety.

Second, USACE has not developed categorical exclusions under the National Environmental Policy Act of 1969 (NEPA) that apply to operational changes to flood control plans. USACE should review its categorical exclusions to determine if minor deviations from flood control plans that improve water resiliency are appropriate for a categorical exclusion. Streamlining agency reviews for minor changes to flood control plans will help improve the ability of water managers to coordinate with USACE and other federal agencies to adapt operating plans to the changing climate conditions in the West. Flexibility and quick adaptation will be critical as these already highly variable western river systems become more variable in the future.

Third, the authorities Congress provided to USACE under Section 1118 of WRDA 2016 and Section 162 of WRDA 2020 are adding value to water management in the West and allow for non-federal entities to partner with USACE to evaluate the efficiency of existing water control plans and propose improvements to water management without sacrificing flood management or dam safety. Ensuring that USACE has the resources needed to implement the authorities provided in Section 1118 WRDA 2016 will help local, state, and federal agencies maximize the use of water supplies in very wet years like 2023.

In addition to the specific recommendations provided above, adapting to climate change in the West will require an all-of-the-above approach that considers infrastructure, operational, and water efficiency improvements, new technology, and ecosystem enhancement. Many invasive plant species grow along Arizona's rivers, including the Colorado, Salt, Verde, and the Gila. These non-native species—such as tamarisk (also known as salt cedar) and arundo, often thrive in degraded river systems, outcompeting native species such as cottonwood and willow, choking and consuming water flow. Funding and technical support made available through USACE can help study and identify key areas that can benefit from removal of these invasive species and replace them with native vegetation that uses less water and improves the ecosystem function.

Providing USACE with funding and authorities to support technical studies, infrastructure and water efficiency improvements, and new advanced water treatment technologies can help improve reliability of water supplies. Congress should take special care to ensure authorities complement and enhance Reclamation programs such as Title XVI and WaterSMART, in order to leverage the resources and expertise of these federal agencies in supporting western communities and improving water resiliency.

Conclusion

As Congress seeks opportunities to support improvements to water resiliency in the West, it should consider improving USACE authorities to support collaboration between federal agencies with complementary missions and non-federal entities responsible for managing water and flood operations. As these agencies work to adapt operations and infrastructure to meet changing climate conditions, their flexibility and ability to partner together are going to be more important than ever. Thank you for the opportunity to testify before you today. I look forward to answering any questions you may have.

Senator KELLY. Thank you, Ms. Meyers.
Governor Lewis.

**STATEMENT OF STEPHEN ROE LEWIS, GOVERNOR, GILA
RIVER INDIAN COMMUNITY**

Governor Lewis. Chairman Kelly and Ranking Member Cramer, thank you for the opportunity to testify today on behalf of the Gila River Indian Community.

The subcommittee's focus on the role of the Corps of Engineers highlights the need for an efficient, all-of-government approach to the drought crisis on the Colorado River. The Corps is a key partner in addressing water management, conservation and infrastructure related to drought and is already engaged in new infrastructure investments, operational improvements at existing facilities, ecosystem resilience and planning assistance.

The Corps has also taken positive steps to ensure that tribal governments, especially those tribes with significant water supplies, are at the table as strategic governmental partners.

I do want to acknowledge that the relationship between the Corps and tribal Nations has not always been a positive one. Historically, decisions around flood control, pipelines and other projects have, at times, pitted the Corps against tribal governments.

There is an important role for the Corps to play in drought mitigation. We have been encouraged by the more recent focus of the Corps, through its current leadership and tribal partnership program, to look for innovative ways to partner with tribes and support those innovative projects that bring long-term solutions to the ongoing drought crisis that we find ourselves in.

In November 2022, the Corps issued new interim tribal partnership guidelines and guidance to expand the types of partnerships through which the Corps can engage with tribal governments. A critical component of the revised guidance is the stated commitment to tribal sovereignty and an acknowledgment of tribal capacity that, in many cases, either meets or exceeds the capacity of the Corps to carry out projects on tribal lands.

Following this guidance, the Community sought to partner with the Corps on a project that was already well underway when the guidance was issued, a pilot project to install solar panels over a stretch of one of the Community's irrigation canals. The Community's concept is that solar over canals would generate renewable energy for operating our system and reduce water evaporation. This concept has been considered but never tested in the United States.

Using the Community's own resources, we commissioned a study that showed that our design would indeed increase system efficiency, conserve water, and generate energy. Although Phase 1 of the pilot project will only cover about 1,000 feet of canal, our study shows real potential for this concept.

To give you an idea of how significant this technology might be, there are approximately 150 miles of canals through the reservation that would be suitable for this installation. If fully developed, we could generate over 750 megawatts of power and conserve over 6,000 acre-feet of water from evaporation loss each year.

This project will have long-lasting water conservation impacts and will serve as a model that can be used by other tribes and local governments. This is the type of project innovation that Congress intended when you included \$25 million for similar pilot projects for solar over canal in the Inflation Reduction Act.

When you are the first to bring a new concept to a large, bureaucratic agency, such as the Corps, the process can be cumbersome. Unfortunately, current Corps policy required that the Corps do its own validation study, which essentially duplicated the work we have already done to study the project and its potential and slowed the project down.

The Corps timeline for construction is also much slower than ours. Their project budget exceeds what the cost would have been if the Corps could contract directly from the community to complete the work under the Indian Self—

Determination and Education Assistance Act. Although the project could already be well underway and heading toward completion, the Corps' inability to contract directly with tribes has slowed the process, exactly what you do not need when you are responding to the drought crisis we are all facing.

While there have been some issues and delay, I want to State that I do think the Corps is moving in the right direction under Assistant Secretary Connor's leadership. In the past few days, we have had major movement from the Corps on our project. The Corps' validation study was approved late last week and the conclusions matched those of the Community's validation study. Both the Community and the Corps are confident that we will be signing an historic partnership agreement for construction of the Solar Over Canal Project within the next 3 weeks.

Based on the Community's experience, my one recommendation for the committee along with the need for continued and expanded funding for the Corps' Tribal Partnership Program, would be to consider statutory language to allow for tribal self-determination programs to be implemented at the Corps because the drought crisis and other complex infrastructure issues can not be solved without tribal governments being at the table as true partners, Senators.

Thank you, Senator Kelly, for inviting the Gila Indian Community to participate in this hearing and for your leadership within the State and the basin on drought issues.

[The prepared statement of Governor Lewis follows:]

**SENATE ENVIRONMENT & PUBLIC WORKS COMMITTEE
TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE**

**“PERSPECTIVES ON NEW AND EXISTING US ARMY CORPS OF ENGINEERS
AUTHORITIES TO RESPOND TO WATER MANAGEMENT ISSUES INCLUDING
DROUGHT AND WATER CONSERVATION”**

**TESTIMONY OF GOVERNOR STEPHEN ROE LEWIS
GILA RIVER INDIAN COMMUNITY**

May 16, 2023

Chairman Kelly and Ranking Member Cramer, thank you for the opportunity to submit this testimony on behalf of the Gila River Indian Community (“Community”). The Community is a federally recognized Indian tribe comprised of over 23,000 members with a Reservation of over 375,000 acres located between the cities of Phoenix and Tucson, Arizona. We appreciate the Subcommittee’s focus on the U.S. Army Corps of Engineers (“USACE”) authorities as they relate to drought and water conservation. While testimony at this hearing will encompass USACE authorities that reach beyond the Colorado River Basin (“Basin”), the Community’s testimony will focus on our experience as it relates directly to the drought and water conservation issues affecting that Basin.

This hearing underscores what the Community believes is the appropriate strategy to address the drought crisis in the Basin. Drought is a complicated and multi-jurisdictional problem requiring an all-of-government approach that looks to utilize all available resources. The Community has been extensively involved in the crisis in the Basin since 2016, resulting in invaluable experience in drought and water conservation management.

During the past twenty-four months, the crisis in our Basin has evolved into what is termed a “mega-drought” and the Community has worked with numerous federal agencies during that period, including the Department of the Interior, the Department of Agriculture, the Environmental Protection Agency, and USACE. In our experience, one federal agency whose role has perhaps been overlooked by others is USACE. The Subcommittee is to be commended for looking at ways to bring USACE more into the overall drought response because, based on our experience, USACE could play an important role in helping in an all-of-government response to addressing the drought. We have seen this with our own, relatively limited, but innovative project, a pilot project for the installation of solar panel covers on one of our irrigation canals.

USACE has worked tirelessly with us to support our development of the project, though there have been frankly some delays that perhaps could have been avoided, and ultimately USACE still lacks the statutory tools to truly treat tribes such as the Community as respected sovereign partners. Before turning to that topic, the Community would like to generally discuss what we have come to know of USACE’s role and potential role in managing drought in the Basin and more generally in the West. We will then turn to our own interaction with USACE in connection with our solar covered canal project, which we believe demonstrates its commitment to managing

drought while working alongside tribal governments. We will conclude with some ideas on how Congress can enhance USACE's role in this critical all-of-government effort.

USACE Role in Drought Response

In working with USACE, we have come to appreciate that USACE has an active role in drought management and resilience. But it is a role that we think could still be expanded. USACE has already contemplated a major role on drought as evinced by the Memorandum on Army Civil Works Supporting Drought Resilience in America's Communities, dated July 2022, which demonstrates the agency's careful and thoughtful consideration of using its authorities to address the growing demand for integrated water resources management. (Attached). The Memorandum highlights action areas in which USACE is partnering with other federal, tribal, state, and local agencies to support drought resilience in communities facing water supply challenges, and it underscores USACE's commitment to an all-of-government approach to addressing drought management.

The Community is aware of specific efforts that USACE has already taken, or is taking, to address drought in a number of critical areas: (1) new infrastructure investments; (2) operational improvements at existing facilities; (3) ecosystem resilience; (4) planning assistance; and (5) tribal and other partnership programs. While the Community's direct experience with USACE is limited to the Tribal Partnership Program ("TPP"), discussed further below, the Community has a few thoughts on the role USACE can play with respect to each of these critical areas to increase water availability and otherwise take pressure off of Colorado River water supplies.

1. New Infrastructure Investments

It is the Community's understanding that USACE is often asked to provide funding and technical support for local water resource infrastructure through its Environmental Infrastructure ("EI") program. The Water Resources Development Act of 2022 ("WRDA 2022") authorized \$4.3 billion of new EI projects, including \$1.5 billion in the seven (7) states that lie within the Basin ("Basin States"). In 2022, USACE provided approximately \$33 million of funding for EI Projects in four of the Basin States, including Arizona, and, in 2023, USACE is funding \$45 million of projects in three of the Basin States, including Arizona. It is the Community's understanding that these projects include reclaimed water pipelines and brackish groundwater desalination facilities, all projects that will help diversify water supplies and incrementally reduce reliance on the Colorado River. The EI program is one that could be particularly well suited for tribes with brackish groundwater, like the Community, and we intend to explore this potential opportunity more fully with USACE in the coming months.

In addition, the Water Infrastructure Finance and Innovation Act ("WIFIA") Loan Program authorized USACE to create a loan program to promote investment in the rehabilitation, repair, and/or improvement of non-federal dams. According to the USACE's National Inventory, there are approximately 1,500 non-federal dams in the Basin States, of which over 800 dams are labeled significant or high hazards. The Community's understanding is that these facilities will help address water supply if restored to full operating capability, and that the Colorado River is a priority for the program, which is expected to accept loan applications in Summer 2023. This

program alone, if properly exploited, could have a very significant effect on water supplies in the Basin on a long-term basis.

2. *Operational Improvements at Existing Facilities*

USACE is also actively engaged in several projects that will result in short-term or long-term changes in reservoir operations associated with flood pool management. USACE's stated goal in these efforts is to use improved forecasting and hydrologic information to allow for modified reservoir operations that maintain acceptable levels of flood protection while increasing storage and/or water releases for the benefit of water supply providers.

For instance, the Community is aware of the Forecast-Informed Reservoir Operations ("FIRO"), a multi-agency research and development initiative focused on states in the West. Preliminary results at Prado Dam in California indicate that an average increase of 7,000 acre-feet annually may be available through FIRO to increase groundwater recharge operations for Orange County Water District. A final viability assessment at Prado Dam is currently scheduled for completion by August 31, 2023, at which time USACE has indicated that it will begin to incorporate the use of FIRO into its water operations plan. This will increase water supplies made available in the Basin, again taking pressure off of the Colorado River as the primary source of water supply in the Basin, particularly if the initiative is expanded, as we understand USACE is doing. USACE has indicated it is in the process of completing preliminary screening assessments on eighty-five (85) dams within the South Pacific Division, including the Basin, which will lead to a prioritization for applying FIRO at other facilities. This is an area in which USACE can have a major impact on water supplies throughout the West.

It is also the Community's understanding that USACE is working with the Bureau of Reclamation and the Salt River Project ("SRP") to complete a review and environmental assessment of a five-year operations deviation at Roosevelt Dam that would modify how water is released from the flood control space at Lake Roosevelt. As SRP will testify, they estimate that revised operations could increase water availability, approximately 20,000 to 60,000 acre-feet annually, for local water providers. Given the reductions Arizona water users like the Community have already experienced, and which we may face again moving forward, we recommend the Subcommittee support USACE in these kinds of efforts, particularly with SRP and elsewhere in the Basin, to help offset the dramatic reductions we are facing.

3. *Ecosystem Resilience*

USACE is also involved in restoration work within the Basin as well as its connected regions. The most important area of ecosystem restoration in the Basin is in the Salton Sea, which is the key to additional reductions in California's Imperial Irrigation District ("IID"). Without a solution to the ecosystem impact of reduced flows into the Salton Sea, IID is limited in its ability to contribute to Basin-wide reductions in use, which are essential to our collective success.

USACE is completing a programmatic Environmental Assessment ("EA"), in cooperation with other federal and state agencies, to facilitate Section 404 permitting of the Clean Water Act and other federal actions associated with California's ten-year, 30,000-acre habitat conservation

and dust mitigation plan for the Salton Sea. USACE has invested Infrastructure Investment and Jobs Act funding to initiate feasibility work on restoration projects that align with the ten-year plan, and other potential projects consistent with federal interests for ecosystem restoration. Based on our most recent briefings by California and Arizona water leaders, the Salton Sea restoration efforts are finally starting to pay off and USACE needs to continue to lead the way with its EA and other investments there.

Lastly, USACE is in discussion with the California Natural Resources Agency to evaluate its potential involvement in a number of environmental restoration projects that could advance stabilization and recovery of endangered species in the Central Valley. The Community believes that accelerated action on these projects over the next several years could improve water availability to Reclamation's Central Valley Project and California Department of Water Resources' State Water Project, which supplies water to Southern California where many municipal water suppliers are also importers of Colorado River water.

4. *Planning Assistance*

USACE is currently in discussion with California Department of Water Resources to conduct a comprehensive study to identify opportunities and constraints of twelve (12) southern California USACE reservoirs and channels to support regional water supply resilience and reduce reliance on imported water supplies. This action would reduce pressures of decreasing imported water sources, including the Colorado River, for over 17 million residents. The Community believes that the findings in this study could subsequently guide future Basin or project-specific funding decisions to ensure existing USACE reservoirs contribute to enhanced economic, ecosystem, and societal values as water demands evolve.

5. *Tribal Partnership Program ("TPP")*

As part of Army Civil Works environmental justice initiatives, USACE has actively engaged in outreach to generate more opportunities to increase its work with tribal nations and improve water infrastructure. The TPP programs is a "gateway" program for underserved tribal communities. In November 2022, Assistant Secretary of the Army for Civil Works, Michael Connor, issued new Interim Tribal Partnership Program Guidance to expand the types of projects that can be done in partnership with tribes. A copy of the Interim Guidance is attached. The Community is aware that long-term TPP guidance is currently being devised, which will streamline how USACE works with tribes and highlight options for cost-share relief to facilitate actions under the TPP.

A critical element of the Interim TPP Guidance is its commitment to tribal sovereignty and genuine government-to-government partnership. Paragraph 5 of the Interim Guidance provides:

In addition, this memorandum directs the Corps to use the utmost flexibility in utilizing and accommodating Tribal expertise and resources in all phases of the TPP program execution, from Indigenous knowledge, to technical expertise in project design and construction, to contracting capability. Many Tribal Nations are as

capable or more capable as any other partner for a Corps Civil Works project, and in many areas can equal the Corps' capabilities.

This is a strong and compelling statement of the commitment of USACE to the TPP and working with tribes as equal governmental partners on projects of potentially national significance.¹

Through the TPP, USACE works with tribes as cost-share partners on Civil Works projects, demonstrating USACE's commitment to engage in regular and meaningful consultation with tribal officials in the development of water resources projects. President Biden's FY 2023 Budget invested \$16,514,000 in the TPP, and \$13,000,000 has been requested in the FY 2024 Budget. If the TPP is embraced by tribes as a tool for water resource management to any meaningful extent, the amounts budgeted for it are woefully inadequate to meet the potential need.

The Community's Solar Covered Canal Pilot Project and the TPP

Beginning in late 2021, the Community began to explore the development of a net-zero farming economy and reducing water use on-Reservation during times of severe drought such as the one we are experiencing now. At President Biden's first Tribal Leaders Summit in December 2021, the Community announced that as part of this exploration, the Community was launching an effort to build a pilot project to test the viability and benefits of covering irrigation canals with solar panels, thereby generating both renewable energy for irrigation canal and on-farm purposes, and also reducing water evaporation from the canals, thereby conserving water. The concept had been considered in the past by some major water delivery entities, and by Reclamation, but had never been tested anywhere in the United States. There was one such project reported in India, but otherwise, it was largely an academic concept with no real world experience.

As part of its dual drought and net-zero initiative, the Community directed the development of a design for a high-profile project site that would test the viability of the concept and provide benefits to the Community's agricultural economy and infrastructure.² Based on the developed design, which benefited from enhanced efficiency in solar panels and lower costs, the Community began exploring possible sources of federal funding for constructing the project.³

Because it was a pilot project, and to ensure the project would be viewed seriously as a potential drought response tool, the Community wanted to ensure that the federal government was engaged and fully supportive of the project. After discussing the project initially with Reclamation, the lead agency for irrigation canal construction on the Community's Reservation, and obtaining its support and partial funding, the Community approached USACE to determine if it might have an interest in working with the Community on this innovative and potentially significant project.

¹ Unfortunately, the commitment is not completely matched by USACE's ability to quickly review and move TPP projects forward, or to allowing tribes the ability, through self-governance, to manage projects on their own. This is an issue we will cover in more detail later.

² The Community invested its own funds in the development of the design for the project, which after its review, Reclamation agreed to fund in order to further the project's development as a project for other tribes and other areas in the Basin.

³ Additional information on the Community's Solar-Covered Canal Pilot Project is attached.

In early 2022, the Community approached Assistant Secretary Connor to discuss the project with him and explore a possible collaboration to develop the project. His office directed us to explore the possibility of funding the project through the TPP. To be frank, unlike many other federal agencies, USACE has not in the past had a reputation within Indian Country of being an easy agency with which to deal. Nevertheless, the Community was encouraged by the reception of the Assistant Secretary and saw an opportunity to further support the Administration's all-of-government response to the drought by working with a new federal agency like USACE.

In November 2022, the Assistant Secretary issued his new Interim TPP Guidelines, with an expanded view of the government-to-government relationship, a solid indication of potential partnership. At that same time, the Community executed an agreement with USACE for the agency to undertake a study to validate the feasibility of the pilot project to confirm the Community's design as a prelude to funding the majority of the project's cost.

Immediately after execution, the Community had expected to begin work on the validation effort, which the Community believed, based on Section 5 of the Interim TPP Guidance, would largely involve deference to the design and evaluation that the Community had undertaken with a nationally recognized firm, at its own cost and expense. The validation study process proposed by USACE at that time was actually one that would have taken at least one year, and possibly two to even complete.

As the Subcommittee is well aware, drought response efforts, especially those that involve innovative pilot projects such as this, require a more rapid timeline for development. The time period for the current proposed response by the Department of the Interior is for the period 2023-26. A recent project that the Community developed with Reclamation to conserve additional water supplies on an expedited basis has an accelerated construction schedule and its conserved water supplies are already being counted toward the total goal of Lower Basin reductions over the next three years in order to help address a crisis situation. Our point is that drought response may seem to be an effort that can take time, and at times perhaps it should, but this is not one of those times, and we urged USACE to accelerate its internal processes and develop new tools to accommodate the urgency required to address the overall water supply in the Basin. It is worth noting that the Community is not asking for shortcuts in quality of review or processes, but rather a reliance on tribes as federal partners where the established experience and expertise of the tribe is acknowledged.

In response to the Community's urging, USACE substantially accelerated its approval processes, and worked with the Community cooperatively throughout the entire process, addressing policy issues as they arose and accelerating the process to catch up with the necessary pace of drought response. USACE began the validation study in January 2023, which was subsequently completed in record time, validating and approving the Community's pilot project and budget in early May 2023. (Copy of the USACE reports attached).

In a meeting with Assistant Secretary Connor this morning, we confirmed the final language for our Partnership Project Agreement this morning and expect to execute it in the next two weeks after final Council approval. We are hopeful that we will find a path to begin

construction on this important pilot as soon as July of this year, with completion expected no more than six months after construction begins.

The Community's cooperation with USACE is a textbook example in many ways of how federal partners can work together in an all-of-government approach to a common crisis. There was excellent communication and cooperation on both sides, and the end result will be a project that will test an important innovation for its potentially significant impact, both on the amount of water that may be conserved, but also on the development of renewable energy to fuel a net-zero farm economy of the future. One of the important takeaways from our work to date is that a solar covered canal project has a much shorter lead time from feasibility to construction because it is an improvement on an already constructed and permitted project, which not only allows for dual use of the lands involved (no new right of ways involved), but also eliminates the need for new environmental reviews. This can accelerate project development timelines for solar projects of this type by 12-18 months, at a minimum.

Despite the overall success of the collaboration, there are also some important lessons learned and areas where congressional action could help improve USACE's implementation of the TPP.

First, as noted above, the total amount of funding for the TPP is set at \$13 million in the FY 2024 budget. Our project alone, small as it is, is budgeted to spend more than \$6 million.⁴ Assuming Congress can help USACE become a better tribal partner by providing USACE self-governance contracting authority, a second recommendation, we believe Congress should consider investing more funds into the TPP to provide USACE the ability to expand its work with tribes.

Second, as noted above, one significant issue for the Community is that USACE has indicated that it cannot contract directly with the Community to provide the funding for the tribe to contract and oversee this project. This is contracting authority that the Community enjoys with almost every other federal agency, and this should be no different. USACE's own Interim TPP Guidance recognizes in Section 5 that tribes such as the Community often have much better experience and capacity in a particular area than USACE, and USACE should respect and rely on it, just like nearly every other federal agency in the government would.

While the requirement for USACE contracting authority may be relevant for other non-federal entities, it cannot supersede the trust responsibility that the federal government and Congress have enshrined in the Indian Self-Determination and Education Assistance Act. We strongly urge Congress to consider providing USACE with self-governance contracting authority. If the Community had been able to contract directly with USACE, the project would have already been completed and the cost would have been for substantially less than the project will ultimately cost. And, most importantly, this would fulfill the federal government's statutory mandate of respecting and building tribal self-governance capabilities.

Despite these critiques, the Community remains a strong supporter of USACE and its efforts to address the drought and water conservation, including those it has undertaken to do with

⁴ This is the budget for the project from USACE. We believe that the project will only cost approximately half that amount when all is said and done.

us. USACE is no doubt one of the most rigid, inflexible, and uncompromising agencies in the federal government, but its leadership is committed to tribal engagement, and we look forward to a continuing relationship as we build this project and possibly more to come that will benefit the Community and the Basin.



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SACW

28 July 2022

MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS

SUBJECT: Army Civil Works Supporting Drought Resilience in America's Communities

1. Purpose. The onset of extreme drought across the nation has been an increasing trend over the past several decades, a situation grounded in and exacerbated by a changing climate affecting temperature, precipitation, hydrology, vegetation, and the overall availability of water. Given this challenge, and as the nation's premier engineering organization, it is important for the U.S. Army Corps of Engineers (USACE) to assess how it can more effectively use its authorities, address the growing demand for integrated water resources management, and apply its significant capabilities to advance a whole-of-government effort to build drought resilience across the nation. This includes meaningful and significant near-term actions to address drought-related issues on a year-to-year basis, while continuing to advance the long-term goal of drought resilience through an array of robust and meaningful actions that make use of the strong partnerships USACE has developed across the country through the Civil Works (CW) program.

During my tenure as Assistant Secretary of the Army for Civil Works [ASA(CW)], I have learned and observed how the CW program currently uses its existing authorities and programs to support drought resilience across the nation, particularly the drought-prone western U.S. In recognition of the breadth of USACE's existing authorities, its capabilities, and informed by the examples of the drought resilience actions highlighted below, this memorandum directs USACE to continue to advance this important work in communities across the nation through a range of actions. In addition, as set forth in more detail in Section 6, Next Steps - Drought Resilience, USACE is directed to provide a comprehensive brief to my office within 45 days on the ongoing, planned, and additional potential CW actions that can further drought resilience at local and regional scales. This memorandum applies to all CW programs and missions, including the Regulatory Program.

2. References.

- a. Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, January 20, 2021
- b. Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, January 27, 2021

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- c. Comprehensive Documentation of Benefits in Decision Document, January 5, 2021, issued by the Assistant Secretary of the Army (Civil Works).
- d. White House Drought Resilience Interagency Working Group – 1 Year Summary, June 1, 2022
- e. Water Resources Reform and Development Act of 2014, Section 1046
- f. Water Infrastructure Improvements for the Nation Act, Sections 1116 and 1117.
- g. Water Resources Development Act of 2020
- h. Water Supply Act of 1958, as amended (43 U.S.C. 390b)
- i. Infrastructure Investment and Jobs Act (P.L. 117-58 also known as the “Bipartisan Infrastructure Law”)
- j. Section 5 of the Flood Control Act of 1941, as amended (Public Law 84-99; 33 U.S.C. 701n)
- k. Congressional Research Service – Testimony, “Short and Long-Term Solutions to Extreme Drought in the Western United States,” Committee on Energy and Natural Resources, U.S. Senate, June 14, 2022.

3. Background.

a. Among natural disasters in the United States during the past four decades, drought ranks third in terms of both total costs and costs per year for damages. According to the National Oceanic and Atmospheric Administration, during the period of 1980 to 2021, 29 drought events with costs in excess of \$1 billion occurred, with total losses exceeding \$291 billion for those events (reference 2.k). Among its many impacts, climate change is making droughts more frequent, severe, and pervasive. As a result, the terms “extreme drought” and “aridification” are now regularly used to describe the current trend.

b. Through the Civil Works mission, USACE can and does support drought resilience through its operation of existing water infrastructure, aquatic ecosystem restoration actions, multi-benefit planning studies, new infrastructure investments, and through a broad array of partnerships to develop and apply scientific data and tools to better assess and respond with equitable solutions to the pressing water resource challenges of the day.

c. During droughts, USACE has managed water resources to provide water for navigation, municipal and industrial use, agricultural use, hydropower, wildlife, and

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recreation. Reservoirs and navigation systems have been operated to balance competing flow requirements and conserve water for multiple benefits in the face of reduced inflows. Extraordinary efforts and coordination with Federal, state, and local agencies, industry and other interested parties helped maintain navigation on major systems like the Mississippi River. During drought emergencies, USACE can and has provided temporary water connections, filtration, transportation, and distribution of water for human consumption.

d. To address worsening drought conditions in the U.S. and to support communities impacted by ongoing water shortages, in April 2021 the Administration launched the Drought Resilience Interagency Working Group (Drought IWG) as part of its National Climate Task Force (references 2.a, 2.b). The Drought IWG complements the ongoing work of the National Drought Resilience Partnership that enhances coordination of Federal drought resilience policies and reinforces the interagency Federal efforts of the National Integrated Drought Information System and the Western States Federal Agency Support Team. As part of the Drought IWG, USACE is increasingly focused on applying its technical capabilities, authorities, and financial resources, as bolstered through the Bipartisan Infrastructure Law (BIL), to support drought resilience in communities increasingly at risk from extreme drought (references 2.d, 2.i).

e. Given the breadth and scale of its role in managing water resources, USACE is uniquely positioned to play an important role in adapting to the changes in hydrology seen on the landscape where climate change is affecting the quantity, form, and timing of precipitation in many parts of the nation, particularly the American West. USACE's responsibilities in the areas of flood risk management, coastal protection, aquatic ecosystem restoration, water supply, and emergency response has the agency working throughout the nation's watersheds. The broad scope of its mission enables USACE to work with its partners to redefine water resources management from peak to shore, the scale necessary to build resiliency in the face of unprecedented water challenges posed by extreme drought.

f. Congress has recognized the value of USACE to address a myriad of the nation's water resource challenges and is charging USACE to take on an even greater role in drought resilience through recent legislation. The Water Resources Development Act (WRDA) of 2020 (reference 2.g) included sections on leveraging Federal infrastructure for water supply, increasing the application of Forecast Informed Reservoir Operations (FIRO), and multiple comprehensive studies to improve water management. Similarly, the House-passed version of WRDA 2022 has provisions on studying aquifer recharge opportunities at USACE projects, a comprehensive Western Infrastructure Study, FIRO expansion, additional environmental infrastructure (EI) water and wastewater projects, and increasing support for Western rural water projects.

4. Actions Demonstrating Drought Resilience. The discussion below highlights action areas where USACE is currently partnering with other Federal, Tribal, state and local

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agencies to support drought resilience in communities facing water supply challenges. These actions all promote drought resilience regardless of the primary purpose of the project or program. They therefore provide a roadmap for developing a more strategic approach to drought resilience as part of a whole-of-government approach.

a. Science and Technology – USACE has long been a leader in the innovative application of science and technology to develop new tools and creative solutions to address cutting-edge issues facing water resource managers. USACE-produced tools such as the Time-series Toolbox and Climate Vulnerability Assessment Tool allow communities to be more drought resilient through a better understanding of potential hydrologic changes and impacts helping with climate preparedness, water supply issues, and drought resilience. Currently, with \$40 million in BIL funding in hand, USACE will work with state and Federal partners in developing and implementing enhanced soil moisture and snowpack monitoring stations in the Upper Missouri River Basin that build on, and add capacity to, an existing network to support drought and flood management. A system such as this could have applicability elsewhere. Also, USACE, working with the Kansas Water Office, is piloting a novel approach to hydraulic dredging of sediment to restore water supply storage capacity in Tuttle Creek Lake.

b. Operation of Existing Infrastructure – While meeting the primary purpose of flood risk reduction at many of its reservoirs, USACE also operates its existing facilities to support local water needs. Applying science and technology initiatives just discussed, USACE has partnered with academia and Federal, state, and local agencies, to apply advanced weather and streamflow forecasts to modify reservoir operations in a manner that does not increase flood risk while also improving water availability and ecosystem benefits. A pilot of this Forecast Informed Reservoir Operations (FIRO) approach at California's Lake Mendocino yielded a 19% increase in water supply in 2020, the third driest year on record. At Prado Dam, a FIRO pilot found that an average of 7000 acre-feet (af) per year of stormwater could be released in a modified manner to allow the Orange County Water District to use the water in its groundwater recharge system and provide additional supply for its customers. Importantly, FIRO and related initiatives are among the most cost-effective ways to increase water availability in drought-impacted regions. In some cases, water availability may be significantly increased on an annual basis for less than 5% of the cost of new infrastructure investments on a dollar per af basis. And even prior to FIRO, for more than 50 years, USACE has been operating a flood control dam and diversion channel on the Big Sioux River to provide artificial recharge for water supply for Sioux Falls. Finally, in the Middle Rio Grande region of New Mexico, USACE coordinated with the Bureau of Reclamation to approve a deviation in operations in 2022 to store water in Abiquiu Reservoir, ensuring water supply for six Middle Rio Grande Pueblos that would have otherwise been lost due to the unavailability to store that water in a Bureau of Reclamation facility.

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c. Water Supply – USACE projects provide water supply storage for hundreds of communities around the U.S. Currently, there are 132 projects with an estimated 10.2 million af of authorized storage space allocated by agreement for municipal and industrial (M&I) water use. In addition, there are 15 projects with an estimated 433,000 af of authorized M&I water not allocated under an agreement. USACE is now funding eight additional studies (five reservoir studies and three locks and dams on the Cumberland River in Tennessee) for reallocation of storage for local water supply. USACE projects also directly support managed aquifer recharge to maintain and enhance local water supply needs at projects in Arkansas, Bayou Meto and Grand Prairie, as well as other locations. Finally, USACE is using its allocation of operation and maintenance BIL funding to ensure that projects like Toronto Lake, Kansas, and Joe Pool Lake, Texas, continue to serve community water supply needs through replacement of water intakes and embankment repair.

d. Recreation Areas – In FY22, USACE funded \$1.9 million in drought related support for the three Missouri River reservoirs (Ft. Peck Dam and Lake, Montana; Garrison Dam, Lake Sakakawea, North Dakota; and Oahe Dam and Lake Oahe, South Dakota and North Dakota) for maintenance and temporary relocation of docks to support safe recreational access during drought conditions. Also in FY22, USACE's Sustainability/Climate Resiliency program provided \$10.5 million to fix waterline breaks, reduce water usage, and ensure the availability of USACE recreation facilities for communities.

e. Aquatic Ecosystem Restoration (AER) – USACE's aquatic ecosystem restoration projects can support drought resiliency by restoring habitat and hydrologic function in oversubscribed or channelized watersheds thereby providing other tools beyond just reservoir releases and the restriction of diversions to maintain and enhance key environmental habitat and support for fish and wildlife species. Restoration opportunities of this nature may also include improving fish passage to facilitate access to better habitat. These types of projects may help to conserve water supply during periods of extreme drought. Relatedly, USACE has allocated \$1.5 million in BIL funding for evaluating restoration activities consistent with California's Salton Sea 10-year Management Plan. By working with the state and other Federal agencies to cover or restore approximately 30,000 acres of exposed lakebed, USACE's restoration activities can reduce ecological water needs and facilitate additional voluntary conservation of Colorado River water in support of overall efforts to preserve system water during this period of unprecedented drought in the basin. USACE is increasing its research in the area of AER, funding and participating in an interagency working group examining how streamflow affects different fisheries.

f. Water Resource Investigations – Increasingly, USACE is being asked to look broadly at its Congressionally-authorized water resource studies to consider integrated solutions with multiple benefits (including drought resiliency) in its traditional navigation, flood risk reduction, and aquatic ecosystem restoration studies. The Yolo Bypass

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comprehensive study is a good example. With a commitment of funding in the President's FY2023 Budget, USACE, in partnership with other federal agencies, the State of California, and local entities, will initiate a new study of the Yolo Bypass to comprehensively assess flood risk management, water supply, agricultural enhancement, and habitat protection and restoration as part of a large-scale overall effort to address water resource challenges in California's Central Valley region. Similarly, USACE has been working with California's Department of Water Resources (CA DWR) on a range of flood control projects (American River Common Features, Natomas, West Sacramento, and Lower San Joaquin) that, based on comprehensive studies, have incorporated nature-based features, levee setbacks, habitat expansion/access, and shallow aquifer recharge opportunities into the project design.

g. New Infrastructure – With significant BIL funding, USACE is using its Environmental Infrastructure (EI) program and Continuing Authorities Program (CAP) to support the development of new infrastructure that in many situations, is providing additional and supplementary water supplies to local communities whether directly (e.g. new pipelines and desalination facilities) or indirectly (e.g. water reuse and aquifer recharge facilities). Of note, during 2022, USACE allocated over \$70 million of BIL funding for environmental infrastructure in the western states most impacted by drought. Examples include using \$2.25 million on a reclaimed water pipeline in Arizona; approximately \$600,000 for non-potable water distribution line for irrigation on the Pascua Yaqui Reservation; and \$4.4 million to fund a brackish water desalination facility for communities in southern California to reduce their reliance on imported water supplies from drought impacted watersheds (i.e. Colorado River and Sacramento/San Joaquin river basin). Another example of new infrastructure promoting drought resilience is the Folsom Dam raise project which will not only improve flood risk management, but also increases storage capacity providing more flexibility in operations that increases water supply and/or helps alleviate unhealthy environmental conditions for threatened and endangered fish species downstream.

h. Water Infrastructure Finance and Innovation Act (WIFIA) Program – Related to USACE's new infrastructure programs is the WIFIA program. WIFIA authorized USACE to create a loan program to promote investment in non-Federal dam safety projects. The proposed rule for this program has been published for a 60-day public comment period and the final rule is expected to be published as soon as spring 2023.

i. Planning for Drought – Through the Planning Assistance to States and other technical assistance programs, USACE has used its technical expertise to support state water planning efforts that include drought resilience. USACE has worked with state and local governments in Texas, Virginia, and Iowa, among many others, to support collaborative planning approaches to drought and other hazards as a result of drought conditions.

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j. Tribal Programs – Based on location and historic underinvestment, Tribal Nations may be the communities most impacted by periods of extended and extreme drought. USACE can assist Tribes become more drought resilient through regular, Congressionally-authorized infrastructure projects, the Tribal Partnership Program (TPP), EI, and CAP. These projects range from environmental restoration actions to build resilience and protect important cultural landscapes for Tribes (e.g. Espanola Valley, Rio Grande, New Mexico) to basic infrastructure investments to improve water supply reliability. In FY2022, USACE allocated \$6.8 million of BIL EI funding and \$6.1 million of BIL CAP funding for tribal projects. Currently, there are 20 active projects and 11 pending projects within the TPP and increasing demand and capability for new investigations and construction funding.

k. Emergency Response and Recovery – Addressing the impacts of drought-induced wildfires in a historically disadvantaged community, USACE recently used BIL funding to act promptly and take several actions to protect the water supply and infrastructure of the City of Las Vegas, New Mexico, at risk of post-wildfire catastrophic flooding and debris flow due to the lack of vegetation within the burned watershed. USACE has released post-wildfire debris flow models for predicting rain-on-snow, precipitation, sedimentation, and ecological impacts for western arid regions, and transitioned this knowledge through training in partnership with agency, state, and academic partners.

5. Regulatory. In addition to the Civil Works program, USACE's Regulatory program can, where appropriate, assist in quickly permitting facilities and infrastructure that are integral to the drought resilience strategies being employed by many communities. As an example, water reuse has become an integral strategy to enhance water supply reliability in many drought-stricken areas. USACE's Nationwide Permit 59 provides authorization for discharges of fill material for the construction, expansion, and maintenance of water reclamation and water reuse facilities. USACE may also issue permits to authorize reservoir sediment management activities that help maintain the storage capacity of existing reservoirs, as well as the continuity of sediment transport that sustains downstream aquatic habitats. Some reservoir sediment management activities may be authorized by USACE's Nationwide Permit 27, and others through individual permits. Use of the nationwide permit process is an efficient, effective tool for authorizing drought resilience work that has no more than minimal adverse effects to the environment. Other nationwide and individual permits that address living shorelines, emergency watershed protection, and aquatic habitat restoration may also support community drought resilience efforts.

6. Next Steps - Drought Resilience. As outlined above, numerous examples exist that describe how USACE uses its existing authorities and capabilities to contribute to drought resilience at local and regional levels. Given this period of extreme drought and the likely continuation of this trend, USACE must continue to advance its efforts to develop and implement integrated solutions that support drought resilience as part of a

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whole-of-government approach. Further analysis is needed as we work to develop priorities that inform future budget requests and to assess the organizational structure needed to manage the allocation of work in an area likely to experience significant growth in coming years. Accordingly, USACE is directed to develop a summary of ongoing, planned, and potential CW actions that support drought resilience, particularly any actions supporting the needs of Tribal Nations, economically disadvantaged communities, as well as science and technology needs or work. USACE should specifically address the following:

- a. *Existing Partnerships and Collaborative Agreements* – Agreements or arrangements with other federal, state, and local agencies to work collaboratively on actions to build drought resilience in specific drought-impacted watersheds or regions as identified by the U.S. Drought Monitor and National Drought Mitigation Center;
- b. *FIRO* – Capability and specific opportunities to increase the number of FIRO pilot projects in drought impacted watersheds or regions;
- c. *Water Supply* – Pending proposals or requests to enter into water supply agreements from USACE reservoirs and/or investigations to directly support water supply projects, particularly those integrating managed aquifer recharge features;
- d. *Investigations* – Existing congressionally authorized investigations (e.g. Yolo Bypass) that require the study of multi-purpose and benefit water resource projects in drought-impacted regions, particularly those with the opportunity to integrate nature-based features;
- e. *EI and CAP* – Assess and identify proposed projects within the EI program and CAP that are likely to contribute to building drought resilience in regions experiencing extended and extreme drought;
- f. *Technical Assistance* – Opportunities to use the Planning Assistance to States, Water Operations Technical Support, or other technical assistance programs to support drought resilience at the local level or to engage with local or regional watershed organizations to assist in developing resilience strategies that may involve multiple agencies and organizations;
- g. *Tribal Nations* – Specific opportunities/requests from Tribal Nations to use the Tribal Partnership Program or other authorized programs (e.g. EI and CAP) to support water resource projects that assist in building drought resiliency;
- h. *Emergency Response and Recovery* – Examples (beyond the New Mexico wildfire example) where USACE assistance has been requested to provide emergency services (e.g. general drought assistance and post-wildfire watershed stabilization actions) and the source of funding used to provide those services;

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i. *Regulatory* – Examples of best practices to improve permitting timelines for facilities and infrastructure important to drought resilience strategies;

j. *Research and Development* – Other capabilities and tools (beyond FIRO) being developed to directly identify, address, and/or mitigate the impacts of drought.

7. Point of Contact. Questions regarding this matter may be directed to Hal Cardwell, Water Resources Specialist, Office of the Assistant Secretary of the Army (Civil Works) at henry.e.cardwell.civ@army.mil.

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MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF
ENGINEERS

SUBJECT: Tribal Partnership Program – Non-Traditional Water Resources
Development Projects

1. References:

- a. Section 203 of the Water Resources Development Act (WRDA) of 2000, as amended. 33 U.S.C. 2269. Tribal partnership program (TPP).
- b. Section 101 of WRDA 1986, as amended. 33 USC 2211. Harbors.
- c. Section 103 of WRDA 1986, as amended. 33 USC 2213. Flood control and other purposes.
- d. Section 1156 of WRDA 1986, as amended. 33 USC 2310. Cost sharing for Territories and Indian tribes.
- e. Letter to the Assistant Secretary of the Army for Civil Works from the Gila River Indian Community (GRIC), dated May 18, 2022.

2. Background.

- a. The United States has a unique trust obligation to federally recognized Indian tribes and their citizens. This obligation, and the responsibilities inherent in the relationship are based on the U.S. Constitution, treaties, statutes, Executive Orders, and other federal laws that define the United States' trust responsibility to Indian tribes and their citizens. Certain principles are fundamental to the trust responsibility and include: (1) respecting tribal sovereignty and self-determination; (2) being responsive and informative in all communications and interactions with Indian tribes; and (3) working in partnership with Indian tribes on mutually beneficial projects.
- b. The TPP is a program that creates opportunities for the U.S. Army Corps of Engineers (Corps) to work closely with and support Tribal Nations through the use of the Corps' capabilities and resources to advance the interests of Tribal communities. Specifically, the TPP, authorizes the Secretary, in cooperation with Indian tribes and the heads of other federal agencies, to carry out water-related planning activities, or

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SUBJECT: Tribal Partnership Program – Non-Traditional Water Resources Development Projects

activities relating to the study, design, and construction of water resources development projects, that will substantially benefit Indian tribes; and are located primarily within Indian country or in proximity to Alaska Native villages. An activity conducted under the Program may address: projects for flood damage reduction, environmental restoration and protection, and preservation of cultural and natural resources; watershed assessments and planning activities; and such other projects as the Secretary, in cooperation with Indian tribes and the heads of other federal agencies, determines to be appropriate. See reference 1.a.

3. Construction of Non-traditional Water Resources Development Projects.

a. The TPP provides authority for the Corps to carry out projects that address the preservation of cultural and natural resources and such other projects as the Secretary, in cooperation with Indian tribes and the heads of other federal agencies, determines to be appropriate. These projects are not typically considered a traditional Corps water resources development project.

b. Pursuant to this memorandum, and consistent with the principles inherent in the federal trust responsibility, the TPP shall be implemented more broadly to provide the Army the flexibility to include projects that are not typically considered a traditional Corps water resources development project. The TPP comprehensive guidance under development shall incorporate these additional "non-traditional" activities under the Program. Further, until such updated TPP comprehensive guidance is issued, the Corps Districts may consider and recommend TPP studies and projects that address the preservation of cultural and natural resources and such other projects determined to be appropriate based on meeting both of the following criteria:

- (1) related to a water resource; and,
- (2) aligns with Corps capabilities and core competency.

The Corps shall elevate those non-traditional projects which do not meet such criteria as soon as practicable (*e.g.*, prior to signing a feasibility cost sharing agreement) to the Office of the Secretary of the Army for Civil Works (ASA(CW)) for a decision by the ASA(CW), in cooperation with Indian tribes and the heads of other federal agencies. In addition, all non-traditional projects under paragraph 3.b. which exceed the current authorized federal programmatic limit for TPP provided by Congress in WRDA must also be elevated as soon as practicable for a decision by the ASA(CW) as to how to proceed.

4. Implementation Considerations for All TPP Projects. The recommendations under TPP must specifically address the determination that the project is feasible and includes the appropriate cost sharing. This determination of feasibility includes that the project is technically feasible; the economic, environmental, and social benefits to the Tribal

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Nation outweigh the costs; the project is cost-effective; and the project is environmentally acceptable. The Corps should consider the breadth of benefits provided including those identified by the relevant Tribal Nation. The primary driver in the implementation consideration is whether the project will substantially benefit Indian Tribes.

a. Study. It is presumed that a project that qualifies under the criteria above is within the federal interest. The federal objective for these studies is to substantially benefit the Indian Tribe. The study includes all activities required to demonstrate that federal participation in the project is warranted and appropriate and is cost shared 50% Federal and 50% Tribal. It is anticipated that the study size, scope, and complexity would be commensurate with the cost of the project.

b. Implementation. The TPP specifically provides that the non-federal share of costs of design and construction of a water resources development project shall be assigned to the appropriate project purposes described in references 1.b. and 1.c. and shared in the same percentages as the purposes to which the costs are assigned. Those statutory cites establish generic cost sharing for water resources development projects based on the project purposes. The design and construction costs of projects for the preservation of cultural and natural resources will be shared in accordance with the cost sharing for navigation, flood risk management, coastal storm risk management, aquatic ecosystem restoration, depending on the causal factors necessitating the project. For other recommended projects, the cost sharing should be assigned to the project purpose for which the proposed activity most closely aligns. For example, for a proposed project including an upgrade to a Tribal irrigation system that would reduce evaporative losses, conserve water resources, prevent growth of aquatic weed, and provide power to an irrigation system (reference 1.d.), the project purpose most closely aligns with the agricultural water supply cost-shared at 65% Federal and 35% Tribal partner.


c. The cost share waiver of Section 1156 of WRDA 1986, as amended, may be applied to both the study and the implementation phase of the project (reference 1.e.).

5. In addition, this memorandum directs the Corps to use the utmost flexibility in utilizing and accommodating Tribal expertise and resources in all phases of the TPP program execution, from Indigenous knowledge, to technical expertise in project design and construction, to contracting capability. Many Tribal Nations are as capable or more capable as any other partner for a Corps Civil Works project, and in many areas can equal the Corps' capabilities.

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6. Questions regarding this matter may be directed to Stacey Jensen, Assistant for
Regulatory and Tribal Affairs, Office of the Assistant Secretary of the Army (Civil
Works), at (703) 459-6026 or stacey.m.jensen.civ@army.mil.



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Pima-Maricopa Irrigation Renewable Energy Project, AZ
I-10 Solar Over Canal
Tribal Partnership Project
Evaluation Report



U.S. Army Corps of Engineers
Los Angeles District
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1.0 Study Overview

The U.S. Army Corps of Engineers, Los Angeles District (Corps) in partnership with the Gila River Indian Community (Community) has evaluated the technical and economic feasibility and environmental acceptability of the proposed Pima-Maricopa Irrigation Project (P-MIP) Renewable Energy Pilot Project (I-10 solar-over-canal). The proposed project would entail the construction of a galvanized steel solar panel array, spanning approximately 1,000 linear feet over the Community owned and operated irrigation canal, known as the I-10 Level Top Canal, located within the boundaries of the Community's tribal lands, south of the City of Phoenix, Maricopa County, Arizona. The I-10 solar-over-canal project would provide renewable energy to offset the Community's electrical power costs associated with operating the 200+ mile P-MIP irrigation system as well as conserve water. The proposed project is also a demonstration project to test the efficacy of the solar-over-canal concept.

This study is being conducted under the Tribal Partnership Program (TPP), as discussed in Section 1.4. This report, with appendices, documents the Corps' evaluation process and will serve as the decision document and basis for the Corps to enter into a Project Partnership Agreement (PPA).

1.1 Background

The Community is the home to two distinct native peoples, the Pima and the Maricopa. Descended from the Hohokam, the Pima (*Akimel O'otham* or "river people") have lived in the Gila River Valley for thousands of years. In this time, the Pima have practiced irrigated agriculture by means of hundreds of miles of hand-dug canals that routed water from the Gila and Salt Rivers to their fields. In the 17th and early 18th Century, the Maricopa (*Peeposh*), whose villages were located along the lower Gila and Colorado Rivers, moved to the middle Gila River and were welcomed by the Pima. While they had separate cultures and languages, the two tribes agreed to confederate together. The Community's reservation was established in 1859, the first in Arizona (Loendorf and Lewis 2017).

The communally built canal system allowed for the intensive farming of the middle Gila River Valley. Prior to the 1860s, the Pima, and later the Maricopa, were economically prosperous. Shifting from subsistence-based agriculture to a market economy, they intensified their agricultural pursuits and began supplying food and cash crops, such as Pima cotton, to the waves of Euromerican explorers and settlers. The Pima first traded with the Spanish explorers and missionaries, then the Mexican troops, and finally with the U.S. military. At the height of their economic power, the Pima and Maricopa were a major supply stop, selling food and other goods to the thousands of miners headed to California as part of the gold rush.

After reaching the pinnacle of their economic power in the mid-1860s, the Pima experienced a steep decline in their condition and status. Through a series of congressional acts, such as the 1862 Homestead Act and the 1877 Desert Land Act, the federal government encouraged the settlement of the American West. Many non-indigenous settlers laid claims to lands upstream from the newly recognized reservation. Failing to recognize the Community's rights to the water, the settlers diverted the much-needed water from the Community leading to famine and poverty (DeJong 2009; Strawhacker 2017).

When it comes to water rights, most western states operate on the "doctrine of prior appropriation" or "first in time, first in right." Even though the Pima had irrigated from the Gila for centuries, the Community found themselves embroiled in a 100-year fight for federal and legal recognition of their

water rights. In 1908 the Supreme Court ruled that the federal establishment of a reservation inherently meant that the reservation must be entitled to sufficient water. The priority date of the creation of the reservation meant that many tribal nations' water rights took precedence over those of most existing users (DeJong 2007a). Despite this ruling, the Community continued to battle for the Gila and Salt River waters.

Between 1905 and 1960, the federal government proposed and constructed a series of irrigation projects designed to provide the Community the limited water that remained in the river. Throughout this period, the Community continued to seek legal resolution to their broader water right claims.

In 1968, Congress authorized the Central Arizona Project as a means of bringing Colorado River water into central Arizona. Among the justifications for the Central Arizona Project was the intent to address Indian water claims, including those of the Community.

Frustrated at the lack of progress on their water claims, the Community filed suit against the United States seeking all the water behind Coolidge Dam and not less than ten percent of the (waters of the) Salt River Project (DeJong 2014). By 1990, the lawsuit had pushed thirty-four state and federal parties into settlement negotiations. The parties established a framework for the Gila River Indian Community Water Settlement Act, which, when signed in 2004, restored to the Community an annual water budget of 653,500 acre-feet and \$200 million to rehabilitate the San Carlos Irrigation Project (DeJong 2014).

During negotiations of this framework, the Community and the Bureau of Reclamation (Reclamation) began discussing the construction of a distribution system to deliver Central Arizona Project contracted water to and across the reservation. The Community entered into a master repayment compact with Reclamation in 1992. Under the authority of the Indian Self-Determination Act, the Community negotiated a self-governance contract with Reclamation to oversee the construction and oversight of the distribution system. The Community established P-MIP and began planning and designing the conveyance system to deliver all Community water resources through a single common-use irrigation system to and throughout the reservation. Construction began in 1998 and is ongoing. The I-10 Level Top canal, over which the proposed solar array would be constructed, is one segment of the larger P-MIP irrigation system.

1.2 Project Purpose

For the past twenty-two years the Western U.S. has experienced intense drought. In 2022 the first-ever tier 1 Secretarial shortage declaration was made for the Colorado River. The Community's annual water budget of 653,500 acre-feet includes 311,800 acre-feet of Central Arizona Project water which comes from the Colorado River, making delivery of Central Arizona Project water in the coming years to the Community questionable.

Large areas of productive land that have been fallow due to insufficient water or are being fallowed due to drought will suffer further degradation of the soil and reduced productivity with future shortage declarations. The I-10 solar-over-canal project would conserve water by reducing evaporative loss from open air canals. It would further benefit the community by generating renewable energy that would offset the Community's electrical power costs to operate the Gila River Indian Irrigation and Drainage District and its irrigation groundwater wells. In addition, the project would conserve important water resources to offset severe and potentially long-term aridification resulting

from climate change. The project would enable tribal growers to receive irrigation water for their crops in a more sustainable and efficient manner.

1.3 Evaluation Scope

In May of 2022, the Community contacted the Assistant Secretary of the Army for Civil Works [ASA(CW)] and requested technical and financial assistance in getting their I-10 solar-over-canal project constructed. At the time of the request, the Community had completed construction level design of the proposed project. In November 2022, the Community signed a Feasibility Cost Sharing Agreement (FCSA) with the Corps to initiate a 100% federally funded study to evaluate the feasibility of the project, with the goal of subsequent construction of the I-10 solar-over-canal project. The Corps was tasked with:

- 1) Reviewing the plans, specifications and other supporting documentation prepared by the Community;
- 2) Evaluating the technical and economic feasibility of the proposed project;
- 3) Identifying any life, health, and safety risks associated with the project;
- 4) Ensuring that the project was in compliance with all federal environmental laws and regulations required for construction; and finally
- 5) If these criteria were met, making a recommendation for construction.

1.4 Study Authority

The study is conducted in accordance with the Tribal Partnership Program (TPP), established by Section 203 of the Water Resources Development Act (WRDA) of 2000 (Pub. L. No. 106-53), codified as amended at 33 U.S.C. § 2269. Under the TPP authority, The Secretary, in cooperation with Indian tribes and the heads of other federal agencies, may carry out water-related planning activities, or activities relating to the study, design, and construction of water resources development projects, that will substantially benefit Indian tribes; and are located primarily within Indian Country.

The TPP also provides authority for the Corps to carry out projects that address the preservation of cultural and natural resources and such other projects as the Secretary, in cooperation with Indian tribes and the heads of other federal agencies, determines to be appropriate. In November of 2022, the ASA(CW) provided additional guidance on the implementation and evaluation of these non-traditional projects (see November 2022 ASA(CW) Memo Tribal Partnership Program — Non-Traditional Water Resources Development Projects). This evaluation study is conducted in accordance with this guidance (Appendix A).

1.5 Study Sponsor

The non-federal sponsor is the Gila River Indian Community. Governor Stephen Roe Lewis of the Community sent a Letter of Request to the ASA(CW) (Appendix B) Commander on May 18, 2022 requesting Army Corps assistance for the I-10 solar-over-canal project. The FCSA was executed between Community Governor, Steven R. Lewis and Los Angeles District Commander, Colonel Balten on November 29, 2022.

1.6 Project Location

The Gila River Indian Community Reservation is located in Central Arizona in Maricopa and Pinal counties. The reservation contains approximately 372,000 acres and is south of the Phoenix

metropolitan area and bisected by Interstate 10. The I-10 Level Top Canal is located just southwest of the Interstate 10 and Arizona State Route 202 interchange. The project area is nestled between the I-10 corridor and the Phoenix Premium Outlet. The project is located in the E1/2 of the NW1/4 of Section 5, Township 2 South, Range 4 East, Gila and Salt River Base and Meridian, Maricopa County, Arizona.



Figure 1 - Project Location



Figure 2 - Aerial View of Proposed Project Elements

2.0 Description of the Proposed Project

The existing I-10 Level Top Canal is approximately 1,020 feet in length and has a top width of approximately 53 feet. The canal includes a reinforced concrete lining, a concrete emergency spillway, siphon inlet and outlet, mechanical, electrical facilities, a traveling water screen trash removal system, a fenced perimeter, and other appurtenances.

The proposed project would entail the construction of galvanized steel framing which would support approximately 962 feet of solar panels. The solar array would include two hinged solar frames on either end of the irrigation canal for operation and maintenance access; all other solar frames would be fixed with pin connections and removable for access to the canal. There are 29 frames, each with 56 solar panels connected to 15 pairs of inverters that are networked to tie into the Gila River Indian Community Utility Authority (GRICUA) transformers. The Community already has a power purchase agreement with the GRICUA to purchase power generated from the I-10 solar-over-canal project.

The inverters would be installed on the west side of the irrigation canal for access. Electrical control boxes would be installed in the existing I-10 Level Top Canal control building. All equipment would be capable of supervisory control and data acquisition (SCADA) enhancement. All major frames would be mounted onto drilled concrete shafts with one at each corner of a major frame component. Each solar panel would be capable of tipping up or could be completely removed for maintenance and replacement service. It is expected that the canal would remain in service during construction. The average lifespan of the solar panels is over 25 years. It is assumed for this analysis that the panels would need to be replaced at the 25-year mark.

3.0 Coordination with Other Federal Agencies

The Corps has coordinated their evaluation of the proposed project with the Bureau of Indian Affairs (BIA) and Reclamation. Reclamation provided funding to the Community for the construction of the 200-mile P-MIP irrigation network pursuant to an agreement entered into under the authority of Pub. L. No. 93-638 (1975). Reclamation does not retain ownership over any lands or easements for the I-10 Level Top Canal; however, maintains regulatory oversight over any major modifications to the canal that would alter its purpose or functionality. The Corps has confirmed with Reclamation that the proposed project would not impact the functionality of the canal and no approvals, permissions, or permits would be required from Reclamation in connection with construction of the proposed project. Because of their longstanding involvement with the canal, the Corps coordinated their environmental review with Reclamation and the BIA. Reclamation, in coordination with the Corps consulted with the Tribal Historic Preservation Officer for the Community.

Further, the Community enter into a Technical Assistance Agreement with Reclamation to provide additional funding for construction. These funds meet the requirements of self-governance (PL 93-638) and may be used to match the Corps funds.

4.0 Results of Evaluation

Before making a recommendation to implement a project, the Corps must determine if the project is feasible. For a TPP project, “this determination of feasibility includes that the project is technically feasible; the economic, environmental, and social benefits to the Tribal Nation outweigh the costs; the project is cost-effective; and the project is environmentally acceptable....The primary driver in the implementation consideration is whether the project will substantially benefit Indian Tribes” (November 2022 ASA(CW) Memo Tribal Partnership Program — Non-Traditional Water Resources Development Projects).

In order to evaluate the technical feasibility, cost-effectiveness, social benefits, and environmental acceptability of the proposed project, the Corps assembled a project delivery team to review the following: electrical engineering, structural engineering, hydraulics and hydrology, cyber security, environmental/NEPA, cultural resources, economics, real estate, and cost engineering. The results of the respective evaluations are detailed below.

4.1 Design Feasibility Evaluation

The technical feasibility of the design from various engineering perspectives was evaluated by the PDT. The design documents can be found in Appendix C.

Electrical Engineering

The proposed design was reviewed by a senior electrical engineer with significant experience in photovoltaic solar design (PV). The design concept, including the input solar radiation for the proposed location, output power, and selected PV solar panels were verified as meeting the design intent. The proposed layout and electrical distribution were also verified as accurate and adequate in accordance with the National Electrical Code and other applicable standards.

Structural Engineering

The final structural drawings and calculations for the proposed structure and foundation supporting the proposed PV system were reviewed by a senior structural engineer from the U.S. Army Engineering and Support Center in Huntsville Alabama. The structural design was verified to meet Government structural design requirements in United Facilities Criteria (UFC) 1-200-01 DOD Building Code and UFC 3-301-01 Structural Engineering.

Hydraulic Engineering

A senior hydraulic engineer reviewed the water conservation yield calculations and the impacts to the existing canal and emergency spillway. The proposed piers and frame supporting the solar panels along the existing canal will be constructed above the maximum design water surface elevation (Emergency Water Surface Elevation). However, five piers from the solar array are located along the emergency spillway, perpendicular to flow. The Gila River Indian Community prepared a memorandum titled “Memorandum Concerning Effect of flow in the I-10 Level Top Canal Emergency Spillway Due to the Addition of 5-two-foot Diameter Piers” (Appendix D) which showed the piers will not adversely affect emergency spillway flows. To mitigate potential erosion of the canal and embankment, P-MIP emergency spillways were designed to convey the full design discharge of the canal. The Appendix D memorandum also explains that the original design of the main stem irrigation system is based on twice the amount of the maximum irrigable acreage contributing to the canal. Exact impact of the project on downstream erosion are unknown, however given the current flow within the canal is less than half of

the design capacity of the spillway significant impacts are not anticipated. Therefore, the existing canal should operate as originally designed and spillway discharges should not be significantly impacted.

Cyber Security

A cybersecurity review of the project was completed and identified various control devices with remote communication capabilities. Control system cybersecurity designs are to be tailored using appropriate cybersecurity design guidance (UFC 4-010-06) and provide practical cybersecurity measures that are to be implemented during construction per a tailored Unified Facilities Guide Specifications (UFGS) 25 05 11. Specifications also identify appropriate technical configuration documentation to support the system owner.

4.2 Environmental Acceptability

A summary of the project's compliance with environmental laws and regulations is provided here and copies of pertinent documents can be found in Appendix E.

National Environmental Policy Act (NEPA) 42 U.S.C. 4321

As discussed in Section 3, the Corps has coordinated their environmental review with Reclamation. Although Reclamation does not hold any real estate for the I-10 Level Top Canal, the agency maintains regulatory oversight over any major modifications to the canal that would alter its purpose or functionality. Further, the Community has entered into a Technical Assistance Agreement for financial support for the project. As a result, Reclamation is also required to comply with environmental laws and regulations as a federal agency involved in the canal and proposed solar projects. In fulfillment of their responsibilities under NEPA, Reclamation completed a Categorical Exclusion (CE) for the project, which the Corps adopted via a Memorandum for Record that was signed in March of 2023 (Appendix E).

The Corps' review of Reclamation's document confirmed that the CE was prepared in accordance with the NEPA of 1969 42 U.S.C. § 4321, et seq. The CE meets Reclamation's evaluation criteria for CEs under 43 C.F.R. § 46.210 and Department of Interior regulation (see 516-DM 14.5 C (3) minor construction activities associated with authorized projects which correct unsatisfactory environmental conditions, or which merely augment or supplement. In accordance with 40 C.F.R. § 1506.3 (d), the Corps concurs with Reclamation's determination that the CE applies to the proposed project because the action covered by the original CE determination and Reclamation's proposed action are substantially the same as the Corps' proposed action. USACE has adopted Reclamation's CE and in doing so has satisfied the requirements of NEPA.

Based on the analyses provided in the NEPA document, no significant impacts were identified for the proposed project implementation. Considering the available information contained in the the NEPA document, the proposed project would have no significant impacts upon the existing environment or the quality of the human environment. Therefore, acceptance of the Reclamation CE is adequate and satisfies the requirements under 40 C.F.R. § 1506.3 (d).

Endangered Species Act P.L.93-205

The proposed project would occur adjacent to the I-10 and Phoenix Premium Outlets within a highly disturbed and urban area. No threatened or endangered (T&E) species or habitat capable of sustaining T&E species occur within the project area. Additionally, no adverse modification of designated critical habitat or adverse impacts to tribal sensitive species are anticipated due to the location of the proposed Project. The proposed Project will have no effect to T&E species.

Environmental Justice

An analysis of demographic data using the U.S. Bureau of Land Management (BLM) Environmental Justice Screening and Mapping Tool (BLM 2022) and the U.S. Environmental Protection Agency (EPA) Environmental Justice Screening and Mapping Tool (EPA 2023) determined that low-income and minority populations (the Community) are present within a 1-mile radius vicinity of the proposed project. The Community estimates that proposed project would conserve an estimated 4.5- 8 acre-feet of evaporative water and generate 1,677 megawatt hours which equates to an AC output generation of 876 kilowatts of solar power generation annually, which would offset the Community's costs to power the Gila River Indian Irrigation and Drainage District, as well as, to operate existing groundwater wells. The Community meets the definition of an "economically disadvantaged community," per 14 March 2023, ASA(CW) Implementation Guidance for Section 160 of the Water Resources Development Act of 2020, Definition of Economically Disadvantaged Community. Specifically, per Section 4.0, "An economically disadvantaged community is defined as meeting one or more of the following: (Sub-section) 4.c. Indian country as defined in 18 U.S.C. 1151 or in the proximity of an Alaska Native Village." Considering that the nature of the proposed project is expected to benefit the Community, there are no disproportionately high and adverse effects to the identified environmental justice populations resulting from implementation of the proposed project, as defined in Executive Order 12898. Section 4.3.1 provides a discussion of the expected benefits to the environmental justice community.

Clean Water Act P.L. 92-500 as amended

Pursuant to 33 C.F.R. § 328.3(b)(3), ditches "excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water" are excluded from the definition of Waters of the United States provided in 33 C.F.R. § 328.3(a). The Canal is an irrigation ditch. The Canal was excavated on and drains in dry land. The Corps has therefore concluded that the I-10 Level Top Canal is not included in the definition of Waters of the United States under 33 C.F.R. § 328.3(b). Therefore, no further analysis would be required pursuant to Section 404 of the Clean Water Act.

National Historic Preservation Act P.L. 89-665 as amended

In accordance with 36 C.F.R. § 800.2, the Corps designated Reclamation as the lead federal agency for the proposed project compliance with Section 106 of the National Historic Preservation Act. The Corps recognizes that Reclamation has regulatory oversight over its long-term operation, and that Reclamation has served as the lead federal agency for prior Section 106 compliance efforts for the construction of the canal that is the subject of the proposed project.

In 1996, the Community's Cultural Resources Management Program completed a Class III cultural resources survey in support of the construction of the I-10 Top Level Canal. No historic properties were identified within the present area of potential effect during that survey. Based on these results, Reclamation requested consultation under Section 106 of the National Historic Preservation Act with the Community, the Corps, and the Bureau of Indian Affairs (BIA) on finding of *No Historic Properties Affected* for the proposed Project on February 9, 2023. The BIA concurred with Reclamation's determination on February 9, 2023 and the Corps concurred with Reclamation's determination on February 24, 2023. The Community's Tribal Historic Preservation Officer (THPO) concurred with Reclamation's determination on March 1, 2023. (Appendix E)

In respect to the THPO's long standing request to not consult with other tribes regarding cultural resources located on Community lands and because of the very limited nature of the undertaking, no additional tribes were invited to consult under Section 106. For the THPO, sharing information about cultural resources on tribal land is a violation of the Community's tribal sovereignty. Pursuant to 36 C.F.R. 800.2(c)(2)(ii)(B), ..."consultation with Indian tribes should be conducted in a sensitive manner respectful of tribal sovereignty."

Summary

This proposed project is in compliance with all applicable environmental laws, Executive Orders, and Corps policies. For NEPA, the Corps coordinated with Reclamation. In accordance with 40 C.F.R. 1506.3, the Corps may adopt Reclamation's determination that a CE applies to the proposed action if the original CE determination is substantially the same as the Corps' proposed action. Here, as discussed in Appendix E, the Corps has made this determination and adopts Reclamation's CE. With regard to the CWA and the ESA, the proposed action falls outside the jurisdiction of these two statutes. With regard to the NHPA, the Corps coordinated with Reclamation, BIA, and the GRIC's THPO. All entities concurred in the determination of *No Historic Properties Affected* for the proposed project."

4.3 Social, Environmental, and Economic Benefit Analysis

The economic analysis for the Pima-Maricopa Irrigation Renewable Energy Project utilizes Other Social Effects (OSE) analysis to fully explore the economic benefits of the project. The OSE account for this project includes an analysis of climate and economic justice benefits, social factors, and life cycle cost-benefit analysis.

4.3.1 Other Social Effects Analysis – Climate and Economic Justice

Methodology

The Climate and Economic Justice Screening Tool (CEJST) 1.0 released in November of 2022 was developed by the Council of Environmental Quality to identify communities with significant burdens in the following categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. This tool was developed to fulfill the Justice 40 Initiative which seeks to deliver 40% of the overall benefits of investments in climate, clean energy, and related areas to disadvantaged communities. A community is considered disadvantaged if they are in a census tract that is at or above the 90th percentile in the one of the eight burden categories and are at or above the 65th percentile for low income. Each burden category has a number of datasets that help identify specific burdens. All federally recognized tribes including Alaska Native Villages are also considered disadvantaged communities. A detailed description of methodology can be found on the CEJST website (<https://toolkit.climate.gov/tool/climate-and-economic-justice-screening-tool>).

Gila River Indian Community Burdens

The Gila River Indian Community is made up of four census tracts. All census tracts are considered disadvantaged in several burden categories. For the purposes of the Pima-Maricopa Irrigation Renewable Energy Project we will focus of the most relevant burden categories: climate change burden and energy burden. Three of the four census tracts meet the threshold for climate change burden. Of the three census tracts that meet the climate change threshold two census tracts are at or above the 95th percentile in climate change subcategory, expected agricultural loss rate. Expected agriculture loss rate measures the economic loss to agricultural value resulting from natural hazards each year. Droughts on the Gila River Indian Community land are severe and frequent and result in agricultural economic loss. Large swaths of agricultural land within the Gila River Indian Community lie fallow due to insufficient water. A portion of the Gila River Indian Community's water budget comes from the Central

Arizona Project which is impacted by the water shortages on the Colorado River exacerbating the water problem.

In addition to climate change burdens, three of four census tracts meet the threshold for energy burden. The three census tracts are at or above the 90th percentile in the energy burden subcategory for energy cost which measures the average annual energy costs divided by household income. This puts a significant financial burden on the citizens of the Gila River Indian Community.

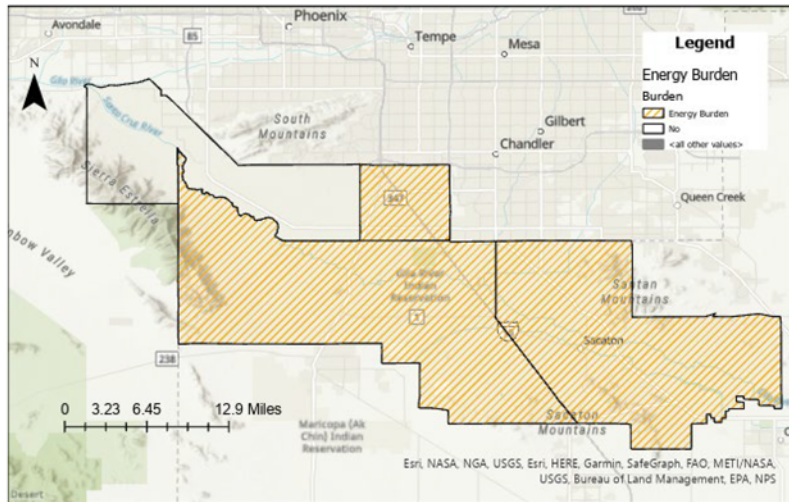


Figure 3 - Gila River Indian Community Energy Burden

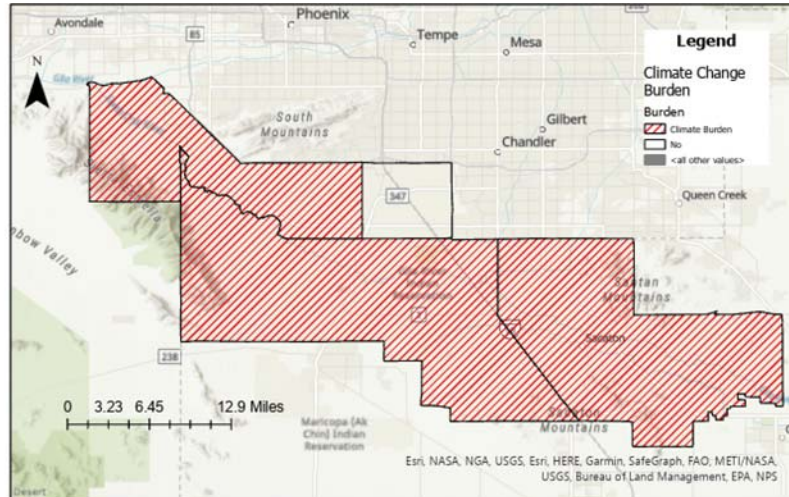


Figure 4 - Gila River Indian Community Climate Change Burden

Climate and Economic Justice Benefits

The Pima-Maricopa Irrigation Renewable Energy Project will involve the construction 1,624 solar panels over 962 feet of irrigation canal. The implementation of the solar panels over the agricultural canals will conserve water that is lost to evaporation and thermoelectric energy usage. This project is expected to conserve 7.98 acre-feet (ac-ft) of water annually (5.4 from evaporation and 2.58 ac-ft from thermoelectric energy usage). Additionally, the solar panels would generate approximately 1,667 MWh annually to the GRICUA. In an area burdened with high expected agricultural loss rate, conservation of water in agriculture irrigation canals will provide an economic and environmental justice benefit to the community.

The project will also produce energy cost savings benefits. Based on an estimate of eight hours of sunlight daily, the value of the power generated from the project is estimated at \$232,000 annually to be taken as credit by the Gila River Indian Irrigation and Drainage District. The credit from power generated from the project will help offset high energy costs providing an economic and environmental justice benefit to the community.

4.3.2 Social Factors

Cultural Identity

Descended from the Hohokam who built the largest irrigation system in North America, the Pima have deep and abiding ties to the land and to its cultivation. For the Community, “agriculture has always been more than a means for earning a living. It has been a way of life that has defined their very essence as Akimel O’otham, or “River People” (DeJong 2007:36). Accounts from Spanish explorers and missionaries reference the elaborate irrigation system employed by the Pima and later the Maricopa.

The construction of the canals was a communal effort with the canal tenders taking a portion of the crops as payment for their work.

In the mid- to late nineteenth century, upstream settlers deprived the Pima and Maricopa of their rights to the waters of the Gila and Salt Rivers. The near century long struggle to return the waters to the reservation and put the land back into agricultural production has been a multigenerational struggle. The importance of the water to the Community cannot be overstated.

The years of litigation have upheld that the Pima-Maricopa people have an immemorial right to the waters of the Gila and Salt River, and as such, that Gila River water is delivered to the reservation at no cost; however, the costs to operate the P-MIP irrigation system is borne by the Community. The proposed project is a demonstration project to test the efficacy of the solar-over-canal concept. For the Pima-Maricopa the creation and maintenance of the canals and agriculture have always been a community endeavor. The proposed project would provide renewable energy that will offset the Community's electrical power costs and would conserve water. It would enable tribal growers to receive irrigation water in a more sustainable and efficient manner.

4.3.3 Cost-Benefit Analysis

Life Cycle Cost Analysis

Life cycle cost analysis captures the cost of constructing and maintaining the project over a fifty-year period of analysis in terms of present value. The total construction cost is captured in Table 2. Over the fifty-year period of analysis, annual inspection and clean-up will be required to maintain the project. The cost of annual inspection and cleanup is based on online price guides. In addition, all 1,624 solar panels will need to be replaced one time over the period of analysis. The cost to replace the solar panels is based on the dollar amount to purchase and install solar panels developed by Los Angeles District cost engineering. The present value of the annual and non-annual costs is captured in the OMRR&R costs below.

Table 1 - Life Cycle Cost Summary

	Present Value	Annual Value
Initial Cost	\$ 4,800,000	\$ 169,000
Routine Annually Recurring OMRR&R Costs	\$ 302,000	\$ 13,000
Routine Non-Annually Recurring OMRR&R Costs	\$ 807,000	\$ 28,000
Total Life-Cycle Cost	\$ 5,980,000	\$ 211,000

Discount Rate 2.5%

FY23 Prices

Comparison of Costs and Benefits

The life cycle cost analysis determined the annual cost to construct and maintain the project over a fifty-year period of analysis totals \$211,000. The benefits are based on annual energy credits from the power generated from the project. As detailed in section 4.3.1 the Gila River Indian Irrigation and Drainage District is estimated to receive an annual credit of \$232,000. When comparing the costs of the project over the period of analysis and the energy credit benefits there is a net annual benefit of \$21,000. While there is always some uncertainty in the OMRR&R costs and in the energy credits benefits and there is a chance that the benefit cost ratio (BCR) does not exceed 1.0. OMRR&R costs and energy credit benefits were selected to best represent the most likely outcome. A summary of the annual costs and benefits are displayed in Table 3.

Table 2 - Summary of Cost-Benefit Comparison

Annual Costs	\$	211,000
Annual Benefits	\$	232,000
Net Annual Benefits	\$	21,000
BCR		1.10

The analysis shown in Table 3 found that the proposed project is economically justified, while the OSE analysis of social and climate-related environmental benefits to the tribe are also positive and significant. The project is thus recommended for federal construction, consistent with the guidance provided for this project.

5.0 Recommended Plan

The Recommended Plan is the implementation of the I-10 solar-over-canal project as designed with the incorporation of some minor changes to the plans and specifications. The current documents are written as if the Community would be overseeing the contract, and therefore, the plans and specifications lack language that would allow the Corps to oversee the construction of the solar project. In addition, due to the passage of time since the design documents were developed certain references in the specifications are no longer valid or have changed. The most noteworthy change is related to increasing the cyber security of the communication/network connection of the solar panels. The cyber security specification will be updated in the plans and specifications to meet the most recent DOD guidance.

During the initial review by the project delivery team a few small changes were made to the plans and specification. During later reviews eleven additional comments were received during agency technical review. None of the suggested modifications would significantly impact the design or the cost. The Corps shall ensure that, if the project is approved, the recommended changes to the plans and specifications will be completed in the next phase of the project. A list of the recommended changes has been included as a coversheet to the plans and specifications to ensure that the updates will be made.

The Corps' evaluation of the solar-over-over-canal project affirmed the Community's calculations that the solar array as designed would generate approximately 1,667 MWh annually to the GRICUA and would save approximately 8-acre feet of water annually, 5.4 from evaporation and 2.58 from thermoelectric energy usage.

5.1 Operation, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R) Requirements and Costs

The purpose of assigning OMRR&R costs is to ensure that these costs are considered in the Corps' evaluation of the feasibility of the propose project and to reinforce commitment and accountability by the non-federal sponsor. The Community, through an agreement with the Gila River Indian Irrigation and Drainage District (GRIIDD), is currently responsible for the operation and maintenance of the I-10 Level Top Canal. It is anticipated that OMRR&R of the solar-over-canal project would occur in concert with the Community's ongoing operation and maintenance activities for the I-10 Level Top Canal. The Community would be responsible for 100 percent of the OMRR&R activities. The average annual OMRR&R costs for the Community are estimated to be \$13,000 annually. Costs associated with the inspection and equipment replacement intervals were estimated based on Corps experience at Corps-managed project sites and the Community's 25+ years of conducting OMRR&R activities along the extensive P-MIP canal system.

While the OMRR&R plan would be developed in the next project phase, it is assumed that the Community will be required to conduct periodic inspections and notify Corps of these activities. Inspections would include visual examination of project features along with recommendations for any features in need of repair. Further, the Community would perform maintenance on the Project features as necessary for the project to remain functional. The technical memorandum dated October 6, 2022, Pima-Maricopa Irrigation Project Solar Over I-10 Level Top Canal Engineering Design and Operations contains a summary of the OMRR&R requirements (Appendix C part 1).

5.2 Real Estate Considerations

The proposed project is located entirely on tribal trust lands or easements held by the P-MIP, a tribally owned entity. There are not expected to be any displaced persons, residences, farms, or businesses. Thus, no relocation assistance as defined by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended will be needed.

The following standard estates have been identified for implementing the recommended plan:

- Fee simple – steel structure to hold solar panels in place
- Temporary work area easement – work area access
- Temporary easement for road – work area access

5.3. Mitigation Requirements

There are no mitigation requirements for the recommended plan.

5.4 Risk and Uncertainty.

A Cost and Schedule Risk Analysis (CSRA) was completed for this project. The purpose of an CSRA is to determine a contingency cost for the project including planning, engineering, design, and construction

management. The CSRA resulted in a construction contingency of 11%. Risks and Uncertainties identified in the CSRA included:

- *Build America, Buy American Act.* Under Pub. L. 117–58, div. G, title IX, Nov. 15, 2021, 135 Stat. 1294, as amended by Pub. L. 117–167, div. B, title II, §10254, Aug. 9, 2022, 136 Stat. 1502, there is a requirement for all federal agencies to procure domestic products and construction materials if the procurement is intended for public use within the United States and if the items or materials are present in the United States in sufficient and reasonably available commercial quantities and are of satisfactory quality.

The Community’s design and the resulting Corps cost estimate are predicated on the use of solar panels manufactured in China. The Community had specific design criteria for the project. First, the solar array could not interfere with the operation and maintenance of the canal. This requirement mandated a specific spacing of the steel framing which in turn restricted the size of solar panels that could be used. Second, since the project is steel intensive and steel is the largest cost driver, the solar panels needed to generate the most power by weight to balance out the ratio between the per watt costs and the costs of the steel framing. And finally, the project spans over a large space in a geographic location with high wind-loads. Wind negatively impacts the efficiency of solar panels. The Community therefore selected panels that have higher power output than average.

These criteria dictated a particular configuration and steel frame size. With the panel wiring and orientation set, the structural calculations were completed including wind loading and seismic loads. The structural components were engineered in accordance with these calculations. Changing the solar panel make and model would likely require a project redesign. A waiver to the Buy American Act would need to be obtained prior to contract award if these components are used in construction.

- *Inflation.* Approximately 64% of the construction costs are material costs. Inflation nationwide continues to rise.

5.5 Public Outreach and Acceptability

While there is no requirement for public outreach or scoping for projects that have been “categorically excluded” from a detailed environmental analysis, the Community has been engaged in community outreach for years regarding energy usage and water conservation. Since May of 2022 when the Community first contacted the ASA(CW) and requested technical and financial assistance in getting their I-10 solar-over-canal project constructed, the Community has held the following engagements to present information about the I-10 solar over canal project:

- May 19, 2022 GRIC Finance Department (5 tribal members)
- May 24, 2022 Community Natural Resources Standing Committee presentation (5 Council members)
- July 13, 2022 Gila River Water Users Association annual meeting (~30 growers)
- August 22, 2022 District 5 Elders committee (8 elders)
- September 20, 2022 Community wide elderly concerns meeting (~120 elders)
- February 15, 2023 Community elders meeting in District 5 (15 elders)
- February 26, 2023 District 4 elders (13 people)

The Community is overwhelmingly supportive of the project. While the Community does not pay for the water, they are ultimately responsible for the high energy costs of pumping the water and operating the P-MIP system, a collective cost of \$1.8 million per year. Feedback from the community is that water is not really free if you have to pay for its delivery.

6.0 Project Implementation

Upon approval of this evaluation report and once construction funding is appropriated, a Project Partnership Agreement (PPA) will be executed between the Corps and the Community outlining the cost-sharing and specific roles and responsibilities of each party during the design, construction, monitoring, and long-term operation and maintenance stages of the project.

The Corps is responsible for approving all design plans and specifications, with potential work in-kind by the sponsor. The Corps would supervise all construction; except where portions of the construction could be performed by the sponsor as work-in-kind, credited toward its cost share, if specified in the PPA, and pre-approved by the Corps.

6.1 Schedule

This schedule is based on receiving construction funds for Fiscal Year 2024.

- Contract preparation – October 2023
- Contract Award – December 2023
- Construction Start – June 2024
- Construction Complete – June 2025

6.2 Project Costs and Cost Sharing:

Total project costs are \$6,500,000. Cost sharing for the I-10 solar-over-canal project will follow the 65% federal/35% non-federal statutory cost share percentages for agricultural water supply in accordance with 33 U.S.C. § 2213(c), which will include credit for LERRDs – lands, easements, rights-of-way, relocations, disposal). However, associated Implementation Guidance (EGM 23-04) modifies cost sharing percentages for Native American Tribes by applying a waiver of \$665,000 to the non-federal share. Pursuant to 33 U.S.C. 2269(d)(1) cost share for Native American Tribes is also subject to “ability to pay” consideration based on the sponsor’s financial capability. Table 3 provides a breakdown of the financial cost-sharing for the Recommended Plan (minus LERRDs which are still under development).

Table 3 - Recommended Plan Financial Costs and Cost Sharing Responsibilities

Item	Traditional Cost-Share Percentages (65/35)			
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	Total First Costs	Federal Cost	Non-Federal Cost	Non-Federal Adjusted Cost after Section 1156 Waiver	Adjusted Non-Federal Cost after Ability-to-Pay	Adjusted Federal Cost
LERRD	TBD		TBD			
Construction	\$6,744,000	\$4,383,600	\$2,236,400			
Project Totals	\$6,744,000	\$4,383,600	\$2,360,400	\$1,695,400	\$423,850	\$6,320,150

7.0 Recommendation

I recommend that the proposed I-10 solar-over-canal project be approved for implementation, as a Federal project, under the existing authority of the Tribal Partnership Program (33 U.S.C. § 2269). I have given consideration to the technical feasibility, environmental acceptability, and the social, and economic effects of the Recommended Plan. The project would involve the construction of a steel framing system that would support 1,624 solar panels over 962 feet of irrigation canal. The panels would be installed approximately three feet over the top of the canal. For the Pima-Maricopa the creation and maintenance of the canals and agriculture have always been a community endeavor. The proposed project would provide renewable energy that will offset the Community's electrical power costs and would conserve water. It would enable tribal growers to receive irrigation water in a more sustainable and efficient manner.

Based on an estimate of eight hours of sunlight daily, the value of the power generated from the project is projected at \$232,000 annually to be taken as credit by the Gila River Indian Irrigation and Drainage District. The credit from power generated from the project will help offset high energy costs providing an economic and environmental justice benefit to the community. The implementation of the solar panels over the agricultural canal would also conserve water that is lost to evaporation and thermoelectric energy usage. This project is expected to conserve roughly 8acre-feet (ac-ft) of water annually (5.4 from evaporation and 2.58 ac-ft from thermoelectric energy usage). In an area burdened with high expected agricultural loss rate, conservation of water in agriculture irrigation canals will provide an economic and environmental justice benefit to the community.

The estimated first cost (Fiscal year 2023 price level) is \$6,744,000. Of the total project costs, real estate costs were estimated at \$174,000, the purchase price of the easement for the I-10 level top canal. Actual real estate costs/LERRD credits are expected to be minimal because the project would involve a small encumbrance to the existing easement. The non-Federal share of project costs, after applying the cost share waiver in accordance with Section 1156 of the Water Resources Development Act of 1986, as amended (33 U.S.C. § 2310), is projected to be \$1,695,400. The Ability to Pay Provision (33 U.S.C. § 2269; EGM 23-04) further reduces the non-Federal sponsor's cost-share to 25 percent of the remainder of the regular 35 percent share (after Section 1156 cost share waiver of \$665,000 is applied). This reduction results in an estimated non-Federal cost share of roughly 6 percent of the estimated total project costs, or \$423,850. Adjusted federal costs are \$6,320,150. The Community has stated that prior to implementation it will, through signing of the Project Partnership Agreement, agree to perform the

required items of cooperation including provision of all needed real estate interests, provision of cash as needed beyond real estate values to constitute its share of total costs, and post-construction operation and maintenance of the project.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch.

28 April 2023

Date



COL Julie A. Balten
Commander and District Engineer
Los Angeles District
U.S. Army Corps of Engineers

8.0 References

- Assistant Secretary of the Army (ASA(CW)). 2022. Memorandum for Commanding General, U.S. Army Corps of Engineers. Subject: Tribal Partnership Program — Non-Traditional Water Resources Development Projects
- DeJong, David H. 2007. *Abandoned Little by Little: The 1914 Pima Adjudication Survey, Water Deprivation, and Farming on the Pima Reservation*. *Agricultural History*, Winter, 2007, Vol. 81, No. 1 pp. 36-69
- DeJong, David 2007a. *"The Sword of Damocles?" The Gila River Indian Community Water Settlement Act of 2004 in Historical Perspective*. *Wicazo Sa Review*, Fall, 2007, Vol. 22, No. 2 pp. 57-92
- DeJong, David H. 2009. *Stealing the Gila: The Pima Agricultural Economy and Water Deprivation, 1848–1921*. Tucson: University of Arizona Press
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- Strawhacker, Colleen. 2017. O'odham Irrigated Agriculture Response to Colonization on the Middle Gila River, Southern Arizona. In *New Mexico and the Pimería Alta: The Colonial Period in the American Southwest*. Edited by John G. Douglass and William M. Graves, pp. 331-351, University Press of Colorado

9.0 Appendices

A - Memorandum: Tribal Partnership Program— Non-Traditional Water Resources Development Projects

B - Letter of Request from Gila River Indian Community Governor Stephen Roe Lewis to the ASA(CW) May 18, 2022

C - Volume 1: Engineering Design and Operations Technical Memorandum

C - Volume 2: Technical Specifications

C – Volume 3: Project Plans

D - Volume 1: Documentation concerning potential operational impacts to the Emergency Spillway

D - Volume 2: Documentation Concerning Evaporative Water Loss Calculations

E – Environmental Compliance



DEPARTMENT OF THE ARMY
 U.S. ARMY CORPS OF ENGINEERS
 SOUTH PACIFIC DIVISION
 450 GOLDEN GATE AVENUE
 SAN FRANCISCO CALIFORNIA 94102-3661

28 July 2022

CESPD-ZA

XX

MEMORANDUM FOR Commander, Los Angeles District (ATTN: CESPL-PD-RN Ms. Danielle Storey), 915 Wilshire Blvd., Los Angeles, CA 90017

Subject: Approval of the Pima-Maricopa Irrigation Renewable Energy Project Final Evaluation Report under the Tribal Partnership Program

1. References:

a. Memorandum, CECW-I, 11 May 2017, subject: Implementation Guidance for Section 1119 of the Water Resources Development Act (WRDA) 2016, Indian Tribes.

b. Memorandum, SACW, 5 February 2018, subject: Implementation Guidance for Section 1031(a) of Water Resources Reform and Development Act of 2014 and for Section 1121 of the Water Resources Development Act of 2016, Tribal Partnership Program.

c. Memorandum, CECW-P, 01 January 2023, subject: Economic Guidance Memorandum, 23-04, Fiscal Year 2023 Tribal Partnership Program Reduced Cost Share Eligibility Criteria (Ability to Pay).

d. Memorandum, SACW, 20 November 2022, subject: Tribal Partnership Program – Non-Traditional Water Resources Development Projects.

e. Engineering Regulation, ER 1105-2-100, 22 April 2000, Planning Guidance Notebook.

f. Memorandum, CESPL-PD, 28 April 2023, subject: Tribal Partnership Program (TPP) Pima-Maricopa Irrigation Renewable Energy Project, AZ-Final Report Submittal Package.

2. As per the above references, this study is authorized by Section 203 of the Water Resources Development Act of 2000 (Public Law 106-541, § 203 [2000]), as amended (33 U.S.C. § 2269). The non-Federal sponsor is the Gila River Indian Community (Community), a Federally recognized Tribe. The study area is located on the Community's land, in Central Arizona in Maricopa and Pinal counties south of the Phoenix metropolitan area. The study evaluates the design of a solar panel array spanning approximately 1,000 linear feet over the Community-owned and operated irrigation canal, known as the I-10 Level Top Canal. The project would provide renewable energy to offset the Community's electrical power costs associated with operating a 200-mile irrigation system, as well as conserve water. The proposed project is also a demonstration project to test the efficacy of the solar-over-canal concept.

3. USACE evaluated the plans, specifications and other supporting documentation prepared by the sponsor to determine whether the project was technically feasible; the economic, environmental, and social benefits to the Tribal Nation outweighed the costs; the project was cost-effective; and the project was environmentally acceptable, in accordance with Reference 1.d. This analysis showed that the proposed project is technically feasible, economically justified, and environmentally acceptable. The Recommended Plan is the implementation of the

CESPD-ZA

Subject: Approval of the Pima-Maricopa Irrigation Renewable Energy Project Final Evaluation Report under the Tribal Partnership Program

I-10 solar-over-canal project as designed with the incorporation of some minor changes to the plans and specifications.

4. Based on the cost of the proposed project, the approval of the final report falls under the authority of the Major Subordinate Command Commander. Under the TPP authority (Reference 1b), Major Subordinate Command Commanders may approve TPP reports and recommended plans when the total federal cost of the recommended plan is \$26 Million or less (per Section 8111 of WRDA 2022). The estimated first cost (Fiscal year 2023 price level) is \$6,744,000. Of the total project costs, real estate costs were estimated at \$174,000, the purchase price of the easement for the I-10 level top canal. Actual real estate costs/LERRD credits are expected to be minimal because the project would involve a small encumbrance to the existing easement. The non-Federal share of project costs, after applying the cost share waiver in accordance with Section 1156 of the Water Resources Development Act of 1986, as amended (33 U.S.C. § 2310), is projected to be \$1,695,400. The Ability to Pay Provision (33 U.S.C. § 2269; EGM 23-04) further reduces the non-Federal sponsor's cost-share to 25 percent of the remainder of the regular 35 percent share (after Section 1156 cost share waiver of \$665,000 is applied). This reduction results in an estimated non-Federal cost share of roughly 6 percent of the estimated total project costs, or \$423,850. Adjusted federal costs are \$6,320,150.

5. The Policy and Legal Review Team (PLRT) has reviewed the final reports and supporting documentation. The PLRT finds the Pima-Maricopa Irrigation Renewable Energy Project Final Evaluation Report to be policy compliant and legally sufficient and concurs with the study conclusions and recommendations. The Final Evaluation Report is hereby approved.

6. Point of contact for this action is Dr. Josephine Axt, CESPD-PDP, 415-503-6590, Josephine.R.Axt@usace.army.mil.

Encl

KATHRYN P. SANBORN, P.E., Ph.D., PMP
COL, EN
Acting Commander

Senator KELLY. Thank you, Governor Lewis.
Ms. Travnicek.

**STATEMENT OF ANDREA TRAVNICEK, DIRECTOR, NORTH
DAKOTA DEPARTMENT OF WATER RESOURCES**

Ms. TRAVNICEK. Good afternoon, Chairman Kelly, Ranking Member Cramer, and members of the Committee. Thank you for your invitation to testify today on the importance of jointly managed water infrastructure in the State of North Dakota.

My name is Andrea Travnicek and I am the Director of the North Dakota Department of Water Resources.

The Department of Water Resources has trust responsibilities for managing and developing North Dakota's waters. We strive to sustainably manage and develop North Dakota's water resources for the health, safety and prosperity of its people, businesses, agriculture, energy, industry, recreation, and natural resources. We know that sound infrastructure must be maintained and modernized to meet multiple objectives.

The Garrison Dam, completed in 1956, forms Lake Sakakawea and was authorized by the Rivers and Harbors Act of 1935 and the Flood Control Act of 1944. The dam is part of a project planning effort known as the Garrison Diversion Unit authorized by Congress in 1965. The Garrison Diversion Unit, associated with the Bureau of Reclamation, diverts water from Lake Sakakawea to provide water for irrigation and water supply.

As part of the Pick-Sloan Plan, irrigation of over 1 million acres and other water development opportunities in central and eastern North Dakota were authorized by the Federal Government. The Snake Creek Embankment impounds Lake Audubon, a sub-impoundment of Lake Sakakawea. Lake Audubon's elevation is cooperatively managed by Reclamation, the North Dakota Game and Fish Department, and the U.S. Fish and Wildlife Service by pumping water from Lake Sakakawea across the Embankment to Lake Audubon, where it is then diverted eastward for its federally authorized uses through the McClusky Canal.

The Embankment is authorized to provide relocation routes for a highway, railroad, and utilities inundated by the creation of Lake Sakakawea and to serve as a sub-impoundment dam for the diversion of Missouri River water to eastern North Dakota as part of the Garrison Diversion Unit.

The diverted water is then used to support the State's largest industry, agriculture, by providing water to the McClusky Canal. The diverted water also supports municipal, rural, and industrial water supplies; fish and wildlife; recreation; and other project purposes in accordance with Federal reclamation laws.

The Embankment's original design included relief walls specifically designed to maintain structural integrity during a high-water differential, ensuring obligations for water and recreational users on Lake Audubon are met even during drought.

In 2007, a post-drought seepage analysis determined there is a potential for adverse under-seepage that could lead to Embankment failure when pool differentials exceed 43 feet between Lake Sakakawea and Lake Audubon and further identified performance issues due to a lack of relief well maintenance.

In 2019, the Embankment Interim Risk Reduction Measures Project identified a selected alternative to modify the Water Control Manual to incorporate an operating restriction that limits the pool differential between Lakes Sakakawea and Audubon to 43 feet during times of extreme drought. This means a partial drawdown of Lake Audubon could occur, which could impact regional water supply projects and irrigation, especially during times of drought when supply is most needed.

In response to concerns, Senator Cramer included a provision in the 2020 Water Resource Development Act directing the Corps to reevaluate structural and operational alternatives to reduce the risk of an Embankment failure; coordinate on the alternatives with State and local entities whose water obligations would be impacted by a drawdown; and to properly account for the economic benefits provided by the Embankment.

In 2021, the Corps initiated a Dam Safety Modification Report for the Embankment to identify and recommend a Risk Management Plan. The recommended plan is an operational alternative to remedy the 2019 Water Control Manual to include risk-informed language, update the dam monitoring and surveillance plan, and remove the formal reference to the 43-foot differential constraint.

While removing the differential is progress, the Corps is not addressing the overall concern of the project in not meeting all authorized purposes that are associated with the Snake Creek Embankment Lake Audubon Project. The draft report and recommended plan are only based on the perspective of potential dam failure that could result in a low-potential loss of life, rather than the breadth of economic and ecosystem impacts associated with the entire Garrison Diversion Unit and Snake Creek Embankment Lake Audubon Project.

The other authorized purposes associated with the project are not fully credited in this study and are therefore minimized when determining the recommended plan and the final benefit-cost ratio. The lack of consideration of the other authorized purposes and the low benefit-cost ratio developed as a result of diminishing the value of these services have led to a decision by the Corps to have an operational fix versus a sound structural fix. This decision leaves current and future projects in jeopardy.

Sound, reliable, infrastructure is a top priority for the State and local project sponsors. As of May 2023, Federal, State, and local partners have already committed over \$500 million to projects dependent on the Embankment's stability to put Missouri River system water to beneficial use. It is imperative that the Corps look at water management from a holistic approach, especially as it relates to all project purposes and directives that have been authorized by Congress.

Furthermore, State and local investments and dependence on reliable water sources that may be impacted by a compromised Embankment must be fully considered for the citizens of our State who are looking to the Federal Government to keep the promises that have been made.

[The prepared statement of Ms. Travnicek follows:]

Testimony of Andrea Travnicek, Ph.D., Director, North Dakota Department of Water Resources

**Submitted to the
United States Senate
Committee on Environment and Public Works
Subcommittee on Transportation and Infrastructure**

**Perspectives on New and Existing US Army Corps of Engineers Authorities to Respond to Water Management Issues Including Drought and Water Conservation
May 16, 2023**

Chairman Kelly, Ranking Member Cramer, and members of the Committee, we appreciate your leadership and thank you for your invitation to testify today on the importance of jointly managed water infrastructure in the state of North Dakota.

My name is Andrea Travnicek and I am the Director of the North Dakota Department of Water Resources. The Department of Water Resources has trust responsibilities for managing and developing North Dakota's waters. The mission of the Department is to responsibly manage North Dakota's water needs and risks for the people's benefit. The Department strives to sustainably manage and develop North Dakota's water resources for the health, safety, and prosperity of its people, businesses, agriculture, energy, industry, recreation, and natural resources. This agency, similar to the U.S. Army Corps of Engineers (Corps), is required to look at management objectives from multiple perspectives and authorized purposes, and we know that overall sound infrastructure must be maintained and modernized to meet multiple objectives.

The Garrison Dam was completed in 1956 and forms Lake Sakakawea. It is part of the Missouri River main stem system that includes six dam and reservoir projects authorized by the Rivers and Harbors Act of 1935 and the Flood Control Act of 1944. The dam is part of a more comprehensive project planning effort known as the Garrison Diversion Unit that was authorized by Congress in 1965. The Garrison Diversion Unit, associated with the Bureau of Reclamation (Reclamation), diverts water from Lake Sakakawea to provide water for irrigation and water supply. As part of the Pick-Sloan Plan, irrigation of over 1 million acres and other water development opportunities in central and eastern North Dakota were authorized by the federal government to compensate the state for land inundated by the construction of Garrison Dam and reservoir.

The Snake Creek Embankment (Embankment) - Lake Audubon Project are additional infrastructure developed in the 1950s and 1960s as part of the Garrison Diversion Unit and include a rolled earthen dam, outlet works, pumping plant, and reservoir. Over time, the Garrison Diversion Unit Act of 1965, the Garrison Diversion Reformulation Act of 1986, and most recently, the Dakota Water Resources Act of 2000 have reduced North Dakota's compensation for economic losses to federal support of only 70,480 of the originally authorized

1,007,000 acres of irrigated water development. In addition, a federal project to deliver Missouri River water to central and eastern North Dakota water users never materialized and now proceeds as a state-funded project. The Embankment - Lake Audubon Project became a multiple purpose point of diversion project that still exists today, although the state has yet to receive its full benefits that were envisioned and promised.

The Embankment impounds Lake Audubon, a sub-impoundment of Lake Sakakawea. Lake Audubon's elevation is cooperatively managed by Reclamation, the North Dakota Game and Fish Department, and the U.S. Fish and Wildlife Service. Reclamation maintains water levels in Lake Audubon by pumping water from Lake Sakakawea, across the Embankment to Lake Audubon, where it is then diverted eastward for its federally-authorized uses through the McClusky Canal.

The Embankment is authorized to provide relocation routes for a highway, railroad, and utilities inundated by the creation of Lake Sakakawea and to serve as a sub-impoundment dam for the diversion of Missouri River water to eastern North Dakota as part of the Garrison Diversion Unit. The diverted water is then used to support the state's largest industry, agriculture, by providing water to the McClusky Canal for irrigation. The diverted water also supports the authorized purposes of municipal, rural, and industrial water supplies; fish and wildlife; recreation; augmentation of stream flows; ground water recharge; and other project purposes in accordance with Federal reclamation laws. The Embankment is a critical piece of infrastructure in North Dakota. But today, the functionality of the Embankment is in jeopardy.

Drought conditions induced record loadings on the Embankment in the mid-2000s. In 2007, a post-drought seepage analysis determined there is a potential for adverse underseepage that could lead to Embankment failure when pool differentials exceed 43 feet between Lakes Sakakawea and Audubon. Furthermore, performance issues were identified due to a lack of relief well maintenance. A risk assessment was performed in 2013 which further substantiated concerns by the Corps. In 2019, the Embankment Interim Risk Reduction Measures Project identified a selected alternative to modify the Water Control Manual to incorporate an operating restriction that limits the pool differential between Lakes Sakakawea and Audubon to 43 feet during times of extreme drought. This means a partial drawdown of Lake Audubon could occur, which could impact regional water supply projects and irrigation.

In response to concerns, Senator Cramer penned a letter to then Assistant Secretary R.D. James asking the Corps to address the underlying maintenance problems in coordination with the affected state and federal partners. He subsequently included a provision in the 2020 Water Resource Development Act (Section 149) directing the Corps to 1) reevaluate structural and operational alternatives to reduce the risk of an Embankment failure; 2) coordinate on the alternatives with state and local entities whose water obligations would be impacted by a drawdown; and 3) to properly account for the economic benefits provided by the Embankment.

In 2021, the Corps initiated a Dam Safety Modification Report for the Embankment to identify and recommend a Risk Management Plan. The recommended plan is an operational

alternative to remodify the 2019 Water Control Manual to include risk-informed language, update the dam monitoring and surveillance plan, and remove the formal reference to the 43-foot differential constraint. While removing the differential is progress, the Corps is not addressing the overall concern of the project not meeting all authorized purposes that are associated with the Snake Creek Embankment – Lake Audubon Project.

The draft report and recommended plan are based on the perspective of potential dam failure that could result in a low-potential loss of life - rather than the breadth of economic and ecosystem impacts associated with the entire Garrison Diversion Unit and Snake Creek Embankment – Lake Audubon Project. The other authorized purposes associated with the project are not fully credited in this study and are therefore minimized when determining the recommended plan and the final benefit-cost ratio.

The lack of consideration of the other authorized purposes and the low benefit-cost ratio developed as a result of diminishing the value of these services have led to a decision by the Corps to have an operational fix versus a sound structural fix. This decision leaves current and future projects in jeopardy. Specifically, the supply of reliable quality water at the agreed-upon points of diversion for North Dakota water distribution systems serving more than 50% of the state's population will remain impacted and uncertain.

The promises of reliable access to water for North Dakota residents has been reiterated in legislative acts associated with the Embankment and the Garrison Diversion Unit. However, continued federal government roadblocks and interpretations continue to delay and impede progress on water infrastructure development projects that are crucial to the citizens of North Dakota.

Sound, reliable, infrastructure is a top priority for the State, and local project sponsors. As of May 2023, federal, state, and local partners have already committed over \$500 million to projects dependent on the Embankment's stability to put Missouri River system water to beneficial use. Northwest Area Water Supply (NAWS), Eastern North Dakota Water Supply and the Red River Valley Water Supply Project put Missouri River system water to beneficial use for more than 60% of the state's population. By the time all 3 projects are completed, over \$2 billion dollars will be invested into the aforementioned water supply infrastructure.

It is imperative that the Corps look at water management from a wholistic approach - especially as it relates to all project purposes and directives that have been authorized by Congress. Furthermore, state and local investments and dependence on reliable water sources that may be impacted by a compromised Embankment must be fully considered for the citizens of our state who are looking to the federal government to keep the promises that have been made.



February 27, 2023

COL Mark R. Himes, P.E.
Commander
U.S. Army Corps of Engineers, Omaha District
1616 Capitol Avenue; Omaha, NE 68102-4901
ATTN: Snake Creek DSMS

Dear COL Himes,

The North Dakota Department of Water Resources (Department) has begun its review of the Snake Creek Embankment Environmental Assessment & Finding of No Significant Impact, which has a comment period open until March 16, 2023. Based on our initial assessment of the draft document and comments provided to Omaha District staff at an agency meeting on February 16th, 2023, the Department does not feel the necessary information has been provided by the Omaha District to provide constructive comments and to perform our due diligence commensurate with the state of North Dakota's trust responsibility to our citizens.

We request an extension of 45-days following the receipt of foundational and supplemental material relevant to the embankment failure risk assessment and economic models that were identified to Omaha District staff at the agency meeting on February 16th, 2023.

Omaha District staff indicated that they would check with their superiors and work to provide access to the critical models and inputs, from which their decisions were derived. The requested documents include:

- Models and inputs used to quantify the probability of embankment failure
- Data sources and citations used to develop the economic analysis
- Basis for assumptions used in the economic and embankment failure analyses

If you have questions or need additional information about this request, please contact Clay Carufel at crcarufel@nd.gov or by phone at (701) 328-4753.

Sincerely,

A handwritten signature in black ink, appearing to read "ATA".

Andrea Travnicek, Ph.D.
Director of the North Dakota Department of Water Resources

Cc: Senator John Hoeven
Senator Kevin Cramer
Representative Kelly Armstrong



State of North Dakota

Office of the State Engineer

Regulatory Division

900 EAST BOULEVARD AVE. • BISMARCK, ND 58505-0850

August 16, 2018

U.S. Army Corps of Engineers
Omaha District
CENWO-PMA-C
ATTN: Ameer Rief
1616 Capital Avenue
Omaha, NE 68102

RE: Draft Environmental Assessment – Snake Creek Embankment Interim Risk Reduction Measures

Dear Ms. Rief,

My staff has participated in several agency and public meetings related to the proposal by the U.S. Army Corps of Engineers (Corps) to change the operation of Lake Audubon. The changes would limit the water surface elevation differential between Lakes Audubon and Sakakawea due to concerns with potential piping through a porous layer underlying the Snake Creek Embankment.

While I appreciate the Corps' efforts to minimize the risk to public safety and public infrastructure that would potentially result from a failure of this important embankment, I would like to point out why we view this as an unacceptable solution and strongly suggest the Corps consider other potential remedies.

If the level of Lake Sakakawea drops below 1804 feet, limiting the head differential between the two lakes to a maximum of 43 feet would result in a Lake Audubon elevation of less than 1847 feet. At a lake level less than 1847 feet, the ability to deliver water through the McClusky Canal is impacted. This would then result in interruptions in water supply for established irrigation demands along the canal and also impact fish and wildlife and recreational uses throughout the Painted Woods Creek watershed. The interruptions in water supply to those irrigated acres, especially during a period of drought which is when a reliable supply of irrigation water is most critical, would prove disastrous to those irrigators who have made significant investments in that irrigation development and who hold water service contracts with the U.S. Bureau of Reclamation. That irrigation development occurred with an understanding that the federal government would honor those water supply contracts. The State of North Dakota has also

GARLAND ERBELE, P.E.
SECRETARY AND STATE ENGINEER

U.S. Army Corps of Engineers
Page 2
August 16, 2018

invested significant amounts of money in that irrigation development. The return on that investment for the people of this state is dependent on a reliable supply of water. Water supply for irrigation and other uses is within the originally authorized purposes of the Missouri River system. The proposed change in operation would, in this case, significantly impact the ability of the Corps to operate their system to support these authorized purposes. I understand and support the effort to mitigate the risks to public safety associated with the embankment; however, we urge the Corps to fully consider alternative solutions that would address the risk without jeopardizing the federal government's ability to honor the existing water supply contracts while also providing a level of certainty required for development of future water supply projects in North Dakota.

There are other solutions available. Let's work together to implement one of those solutions rather than simply taking what, on the surface, may appear to be the least expensive solution. If the costs to the people of North Dakota are properly considered, simply placing a limit on the head differential between the two lakes is not the least expensive solution.

Sincerely,



Garland Erbele, P.E.
ND State Engineer

GE:JGK:pdh/0237

cc: Senator John Hoeven
Senator Heidi Heitkamp
Representative Kevin Cramer
Governor Doug Burgum
Duane DeKrey, Garrison Diversion Conservancy District



March 15, 2023

U.S. Army Corps of Engineers
ATTN: PMA-C Snake Creek DSMS
1616 Capitol Avenue
Omaha, NE 68102-4901

RE: Snake Creek Embankment Environmental Assessment and Finding of No Significant Impact

Dear Ms. Podkowka,

Thank you for the opportunity to comment on the draft Snake Creek Embankment Environmental Assessment and Finding of No Significant Impact (EA). The North Dakota Department of Water Resources (Department) appreciate the U.S. Army Corps of Engineers (Corps) working with the affected agencies regarding the Snake Creek Embankment (embankment) and sharing it with the public.

The Embankment is authorized to provide relocation routes for a highway, railroad, and utilities inundated by the creation of Lake Sakakawea and to serve as a sub-impoundment dam for wildlife, recreation, and diversion of Missouri River waters into the James and Sheyenne Rivers. The Embankment's reservoir inundates approximately 16,600 acres, with a total shoreline of approximately 152 miles. The Embankment ensures water is available in Lake Audubon (the sub-impoundment) for developing North Dakota water supply projects and supports the state's largest industry, agriculture, by providing water to the McClusky Canal for irrigation. Given all of the assets reliant on the Embankment, it is a critical piece of North Dakota infrastructure.

The Department very much appreciates the recent communication from the Corps noting that all supporting data used in the development of the EA will be shared and also the extension of the comment period for the cooperating agency review. Our concerns based on our review of the EA without the supporting data include:

1. The Corps has not fully considered the benefits of the Eastern North Dakota Alternate Water Supply (ENDAWS) Project and the Central North Dakota Water Supply (CNDWSP) Project.
2. The Corps has not fully considered the seriousness of the water quality and quantity issues that will be alleviated by the Northwest Area Water Supply (NAWS) Project.

Snake Creek Embankment Environmental Assessment and Finding of No Significant Impact
Page 2 of 4
March 15, 2023

3. The Corps has not provided the necessary information on the probability of Embankment failure for us to comment on behalf of the citizens of North Dakota.
4. Finally, by not pursuing a structural fix of the Embankment, the federal government continues to go back on their promises to the State of North Dakota related to the Garrison Diversion Unit (GDU).

Details on the concerns noted above are described below.

The EA estimates that a failure of the Embankment would result in a one-year maximum loss of benefits from ENDAWS of \$436M. During the agency call with the Corps, it was stated that it would take several years to repair the embankment if it were to fail. For this reason annualizing the impacts is an incorrect assumption for estimating the benefits. This value is also low in comparison to other reports completed by the federal government. The Bureau of Reclamation's Final Environmental Impact Statement for the Red River Valley Water Supply Project (RRVWSP FEIS) estimated that the damages to the regional economy would be approximately \$2B (2007 dollars) for each year of a 1930s-style drought and where the Red River Valley doesn't have an additional water supply. This Corps-produced EA quantified the loss of benefits for North Dakota water supplies using a household water use perspective only and did not consider other economic impacts that were included in the RRVWSP FEIS. These impacts include losses to industries directly dependent on agricultural production, unemployment from drought-related declines in production, strain on financial institutions (foreclosures, capital shortfalls), a reduced tax base for federal, state, and local governments, losses for manufacturers and sellers of various types of equipment, and other impacts. These losses should be included in the estimate of loss of benefits for ENDAWS.

This EA also analyzes the CNDWSP from a household use perspective. Since the purpose of the CNDWSP is to support industrial growth in North Dakota, it would be more appropriate to assume some level of industrial buildout in the project area and include the economic benefits from those industries. Additionally, if ENDAWS and CNDWSP can't be counted on in severe North Dakota droughts (because Lake Audubon could be drawn down and flows to McClusky Canal cut off) then industries will have less incentive to expand into the project area. Not assuring these water supplies by choosing a structural alternative for the embankment undercuts North Dakota's ability to expand industry throughout the project areas and must be accounted for in the economic analysis of the alternatives.

The purpose of the NAWS project is to alleviate water quantity and quality issues in Northwest North Dakota. Multiple communities in the project area are NAWS customers because their primary water source doesn't meet primary or secondary drinking water standards. For example, the City of Kenmare's water source has arsenic levels that exceed primary drinking water standards. The interim water supply for the NAWS project is provided by the ground water wells from the City of Minot. However, the demand on the City of Minot's groundwater wells is unsustainable, and the aquifer is being depleted. The Bureau of Reclamation's 2015 Final

Snake Creek Embankment Environmental Assessment and Finding of No Significant Impact
Page 3 of 4
March 15, 2023

Supplemental Environmental Impact Statement for NAWS said that “future availability of aquifer water for the City of Minot is very uncertain both in terms of quantity and quality.” This means that if the Embankment were to fail in the future and the NAWS intake under construction on Lake Sakakwea was plugged, communities throughout the NAWS project area may have to revert to water supplies that don’t meet drinking water standards. By choosing a structural fix of the Embankment, the Corps would assure a clean drinking water supply for generations of North Dakotans in the NAWS project area.

The viability of each alternative in the EA is determined by its Benefit-Cost Ratio (BCR). In the case of Risk Management Plans (RMP) 3 and 4, the structural alternatives, the BCR is based on the likelihood of Embankment failure and the economic consequences that would follow a failure. The Corps has made the economic side of the equation generally clear, but has left the likelihood side obscure. The Corps has discussed some aspects of their risk assessment but have not shared all the information that was used in determining the probability of Embankment failure. This includes the uncertainty in the data that was used in the probability determination. All data has some level of uncertainty in it. For instance, in Figure 12 in the Low Pool Drought Frequency Analysis section, the Corps show that there are uncertainties around the Annual Non-Exceedance Probability (AnEP) for severe drought loadings, which likely factored into the estimated probability of Embankment failure. In the case of maximum head differential loading, the Corps show that the AnEP could vary by a factor of 50. We mention this because it may be that the uncertainty in the failure probability is large enough to make a structural fix of the embankment the right choice. If we assume that the AnEPs (and their uncertainties) are proportional to the BCR, that the Corps assumes the conservative end of the AnEP uncertainty ranges (a sound engineering principle), and the Corps assumes the “full use” of water for ENDAWS and the CNDWSP (which would still be lower in economic benefits estimated in the RRVWSP FEIS), the BCRs of RMP 3 and 4 would likely be above 1.

The State of North Dakota notes that the Snake Creek Embankment was constructed as part of the works of the Garrison Diversion Unit (GDU), which was authorized following the Flood Control Act of 1944 (FCA). The FCA is fundamentally based on a compromise, with the lower basin receiving flood control and navigation benefits and the upper basin receiving irrigation and hydropower benefits. The FCA and subsequent GDU envisioned significant irrigation and water supply benefits in the State of North Dakota. Over time, many parts of the GDU plan were stifled and one of the programs that evolved from it is the Municipal, Rural, and Industrial Water Supply Program. The State of North Dakota has used this program, and the current GDU works to develop and meet the water supply needs of our citizens. Putting this in jeopardy by opting to not maintain the infrastructure is unacceptable.

The State of North Dakota does not support the Preferred Alternative identified in the draft EA because, based on the provided information, we believe that the Preferred Alternative is being chosen based on an oversimplified economic analysis. Following the review of the additional information to be provided by the Corps, the Department will likely favor a structural alternative

Snake Creek Embankment Environmental Assessment and Finding of No Significant Impact
Page 4 of 4
March 15, 2023

that promotes sound infrastructure that allows North Dakota to continue using the resources as originally promised.

The Department appreciates the Corps again for allowing an extension of the review period and allowing our agency to review the detailed information used in the development of the EA.

Sincerely,



Andrea Travnicek, Ph.D.
Director
North Dakota Department of Water Resources

cc: Senator John Hoeven
Senator Kevin Cramer
Representative Kelly Armstrong
John Reiten, North Dakota Governor's Office



February 25, 2022

U.S. Army Corps of Engineers, Omaha District
Planning, Programs, and Project Management Division
ATTN: Aaron Quinn
1616 Capitol Avenue
Omaha, NE 68102-4901

RE: Snake Creek Embankment Interim Risk Reduction Measures

Dear Mr. Quinn,

Thank you for the opportunity to comment on the scope of the Dam Safety Modification Study (DSMS) for the Snake Creek Embankment (Embankment). I appreciate and share the United States Army Corps of Engineers' (Corps) concern about the integrity of the Embankment and what it means for public safety. While I support the Corps' study to learn more about the Embankment, we find any plan that could lower McClusky Canal flows to be unjustifiable and insist that the Corps explore other solutions that include permanently fixing the Embankment. Locking in the max head differential between Lakes Audubon and Sakakawea is concerning since the authorized purposes associated with related projects in the vicinity would be impacted.

During drought conditions, it's possible that water levels on Lake Sakakawea could drop below 1,804 msl. If the max head differential between the lakes is limited to 43 feet, water levels on Audubon would then drop below 1,847 msl. This would impact water supply to the McClusky Canal thus impacting water users. Interrupting the use of this developed water supply would harm the State of North Dakota and its citizens in a variety of ways.

Specifically, a number of North Dakota agricultural producers rely on the canal for irrigation. Producers have invested in irrigation development along the canal, and they hold water contracts with the U.S. Bureau of Reclamation. Producers made these investments with the belief and trust that the federal government would honor their water contracts until at least 2051. Interruption of the water supply during a drought could impact the livelihood of the farmers and ranchers within the area.

Water supply for irrigation is within the authorized purposes of the Missouri River system. Interrupting the water supply would, in this case, keep the Corps from performing one of their authorized purposes. While I understand the Corps' concern about the integrity of the Embankment, a solution that lets the Corps perform all their authorized purposes and lets the Bureau of Reclamation deliver on their water supply contracts is the most optimal solution. This

would provide certainty about future water development along the McClusky Canal in North Dakota.

In addition, interruption of water supply would impact recreation along the canal's course. The Chain of Lakes recreation area, New Johns Lake, and Lake Brekken-Holmes all benefit from the canal water. Low water would limit recreation on those lakes and deprive North Dakota of recreational revenue. This would come at a time when recreation is already limited due to low water levels on Lake Sakakawea.

Compromising the canal water supply also negatively impacts North Dakota's fish and wildlife. The canal supplies water to the Painted Woods Creek watershed and supports many Waterfowl Production Areas along its course. Diminished canal flows would not only result in harm to the related ecosystems, but would also reduce opportunities for sportspeople.

Also of note, in accordance with North Dakota Century Code §61-16.1-38, any construction modifications to the Snake Creek Embankment that result from the Dam Safety Modification Study may require a construction permit from the Department of Water Resources (DWR) based on the storage volume and hazard classification.

With regard to your request of the DWR to participate in this effort as a cooperating agency, you will be contacted in the coming weeks by Jon Kelsch, our Director of the Water Development Division to follow up on next steps.

Thank you again for the opportunity to comment on the scope of the DSMS. The DWR looks forward to cooperatively working with the Corps toward a solution that protects the integrity of the Embankment, as well as the interests of the state of North Dakota.

Sincerely,



Andrea Travnicek, Ph.D.
Director of Water Resources

CRC



RED RIVER VALLEY WATER SUPPLY PROJECT



LOOKING AHEAD
2023-2025

\$180
MILLION

SENATE BILL 2020

QUICK FACTS



TRANSMISSION PIPELINE



MAX FLOW



CITIES/RURAL SYSTEMS
(50% Of ND Population)



LEGISLATIVE DISTRICTS
(6, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 25, 27, 29, 33, 41, 42, 43, 44, 45, 46)

CURRENT DWR COST-SHARE

75%

BACKGROUND AND PURPOSE

The Red River Valley Water Supply Project (RRVWSP) began as a joint federal, state, and local effort to deliver high quality Missouri River water to the region. The Dakota Water Resources Act of 2000 authorized the project to provide a supplemental water source for improved drought resiliency for the Red River Valley. In 2013, it was clear the project would not receive federal approval. Today, the project continues with state and local sponsorship. RRVWSP will deliver Missouri River water to central and eastern North Dakota from south of Washburn to a discharge in the Sheyenne River. In conjunction, Garrison Diversion Conservancy District and the Lake Agassiz Water Authority (LAWA) are also pursuing the Eastern North Dakota Alternate Water Supply (ENDAWS), which would utilize the McClusky Canal as a water source.

HISTORIC FUNDING

Local	\$26M
State	\$117M

PROJECTED COST SCHEDULES

RRVWSP - 10 Year	\$1.79B
RRVWSP - 8 Year	\$1.74B
RRVWSP - 6 Year	\$1.7B
ENDAWS - 10 Year	\$1.41B
ENDAWS - 8 Year	\$1.4B
ENDAWS - 6 Year	\$1.3B

FUTURE FUNDING

Est. Remaining Funds	\$1.18B-1.59B
Local	\$302M-\$407M
State	\$877M-\$1.19B

LOCAL SPONSORS

The Garrison Diversion Conservancy District is made up of 28 member counties who each elect a citizen to serve on the board of directors. The principal mission of the organization is to provide a reliable, high quality, and affordable water supply to benefit the people of North Dakota.

In 2003, the North Dakota Legislature created LAWA to address future water needs in the Red River Valley. LAWA was further directed to develop a reliable supply of drinking water to central and eastern North Dakota. LAWA serves as the representative for RRVWSP water users, and is a cooperating entity with the Garrison Diversion Conservancy District.



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MAY 2023



NORTHWEST AREA WATER SUPPLY PROJECT



LOOKING AHEAD
2023-2025

\$36 MILLION
(\$50M line of credit also available.)

SENATE BILL 2020

Funding for Intake Contract 2, Bottineau and Souris reservoirs and pump stations, booster pump stations, Minot Water Treatment Plant (WTP) Phase III, raw water line, and Biota WTP Phase II design.

QUICK FACTS



FUTURE WATER USERS
(10% OF ND POPULATION)



SYSTEMS SERVED



MILES OF PIPE



LEGISLATIVE DISTRICTS
(2, 3, 4B, 5, 6, 38, 40)

CURRENT DWR COST-SHARE

65%*
*Biota Water Treatment Plant -
100% Federal Funds

BACKGROUND AND PURPOSE

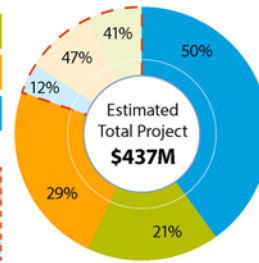
The purpose of the Northwest Area Water Supply (NAWS) project is to address long-standing water supply and poor water quality problems in northern North Dakota by delivering high quality Missouri River water to the region. NAWS was authorized by the Garrison Diversion Reformulation Act of 1986 and the Dakota Water Resources Act of 2000 under the Municipal, Rural, and Industrial (MR&I) Water Supply Program. Construction of NAWS began in April 2002, with a main line and associated features being built between the City of Minot and Lake Sakakawea. Later in 2002, lawsuits were initiated, delaying the project for years. The District Court ruled in favor of the project in 2017, and that decision was upheld by the Appellate Court in 2019 - ending 17 years of litigation. Today, construction on the NAWS project is back underway, with interim water supplies provided by the City of Minot. Phase I of the Biota Water Treatment Plant is scheduled for completion in 2024, with overall project completion in 2029.

HISTORIC FUNDING

Local	\$74M
State	\$102M
Federal	\$176M

FUTURE FUNDING

Est. Remaining Funds	\$85M
Local	\$35M
State	\$40M
Federal	\$10M



LOCAL SPONSOR

In 1991, the state passed into law a bill creating the NAWS Advisory Committee (including one person representing Minot, water resource districts, State Water Commission (SWC), Turtle Mountain, rural water, other municipal, Garrison Diversion, and at-large), while giving the SWC the authority to construct, operate, and manage the project. The City of Minot has been funding the entire local share of the project to date through a 1 percent city sales tax.



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MAY 2023

Senator KELLY. Thank you, Ms. Travnicek.
Ms. Verleger.

**STATEMENT OF JENNIFER VERLEGER, CHAIR, WESTERN
STATES WATER COUNCIL**

Ms. VERLEGER. Chairman Kelly, Ranking Member Cramer, and members of the committee, thank you for holding this hearing and your efforts to achieve a balance between Federal policies and programs and the role of the States in our Federalist system.

My name is Jennifer Verleger. I am here today as the Chair of the Western States Water Council. I am also an Assistant Attorney General for the State of North Dakota, where I represent the State Water Commission and the Department of Water Resources. In that capacity, I am also a delegate to the Conference of Western Attorneys General. Additionally, I sit on the board of the National Water Supply Alliance which focuses on Corps water supply issues.

Over the decades, western States and the Corps of Engineers have butted heads when State water law has conflicted with Federal programs and priorities, particularly when it comes to water supply. The problem can be illustrated with an analogy. Think of a typical kitchen sink. There are usually two sides to the sink, with a divider in the center and a faucet that swings between each side.

On one side, the drain is plugged. This is the Corps' storage reservoir. On the other side, there is no plug, which is the flowing river. The running faucet is the upstream river and surface runoff, which is controlled by Mother Nature.

The Corps controls which side of the sink the faucet is running into by opening and closing the outflow of its reservoirs. Once the plugged side of the sink is full, the Corps must drain some of the water, or move the faucet to the uncontrolled, free-flowing side.

The Corps takes the position that all of the water in the sink is in storage and subject to their control and the fees they charge. The States take the position that the sink is in their own house, and that even though the Corps gets to control which side of the sink is filling, it only gets to enter a water supply agreement or charge users when they take water from the plugged side of the sink. Water that is coming out of the faucet, before it gets to the sink, for example when you fill a glass, and water that flows into the open portion of the sink is the States' to appropriate.

After several years of the States' unsuccessful attempts to resolve their differences with the Corps over this issue, a provision was included in WRDA 2014 prohibiting the Corps from charging surplus water fees in the Upper Missouri River Basin for 10 years.

However, undeterred, in 2016, the Corps published its Proposed Water Supply Rule. The States had several issues with the proposed rule. Despite the Corps' insistence that it sells "storage," the rule never defined that term. As a result, the Corps continues to assert that all the water in the reservoir is its to manage. In other words, the entire kitchen sink.

In the rule, the Corps specifically stated that it was aware of North Dakota and other States' position that "users should not be required to pay for benefits they do not receive," but stated that the law "does not require the Corps to undertake such an analysis."

Not only did the proposed rule require States to pay for benefits they do not receive, it usurped the States' rights and authority to control and allocate their own water resources. It ignored multiple declarations from Congress that States have the primary responsibility for water supply and water management.

Congress and the courts have unequivocally established and repeatedly affirmed the doctrine of cooperative federalism regarding water management issues. There was bipartisan opposition to the proposed rule from the Western States Water Council, Conference of Western Attorneys General, and Western Governors Association. There was bipartisan opposition to the rule from 19 Senators, including Senators Cramer and Merkley.

Ultimately, the Proposed Water Supply Rule was withdrawn in 2020. Most recently, Senator Cramer successfully incorporated into WRDA 2022 a permanent ban on the Corps from charging surplus water fees from the Upper Missouri River Basin. While this resolves the issue for some States regarding fees, it still leaves the fee issue open for other States as well as leaving unresolved, for all States, the issue regarding control over the water allocation.

As such, WRDA 2022 established the Western States Cooperative Committee, which requires the Corps to annually meet with delegates from the Western States to develop and make recommendations to avoid or minimize conflicts between Corps projects and water rights and water laws of the western States. The committee must provide a report to Congress.

The Western States Water Council and the Conference of Western Attorneys General are working diligently with their memberships to make their committee appointments. In fact, I believe we have sent a letter that went out yesterday making some of those appointments.

While there is no expectation the committee will be the end-all solution to States' conflicts with the Corps, there is hope that with this additional congressional oversight, the Corps will take the cooperative portion of its cooperative federalism responsibilities more seriously.

Thank you for the opportunity to testify and I stand for any questions.

[The prepared statement of Ms. Verleger follows:]

Testimony of Jennifer L. Verleger, Chair, Western States Water Council

**Submitted to the
United States Senate
Committee on Environment and Public Works
Subcommittee on Transportation and Infrastructure**

**Regarding Perspectives on U.S. Army Corps of Engineers' Authorities
to Respond to Water Management Issues**

May 16, 2023

Chairman Kelly, Ranking Member Cramer, and members of the Committee, thank you for holding this hearing and your efforts to achieve a balance between federal policies and programs and the role of the States in our federalist system.

My name is Jennifer Verleger. I am here today as the Chair of the Western States Water Council (WSWC), which is a bi-partisan organization representing eighteen western States, created by the Western Governors Association in 1965, to advise them on water-related issues.

I am also an Assistant Attorney General for the State of North Dakota, where I represent the State Water Commission and the Department of Water Resources. In that capacity, I'm also a delegate to the Conference of Western Attorneys General (CWAG).

Additionally, I sit on the board of the National Water Supply Alliance (NWSA), which is a national organization of state, regional, and local governments, as well as wholesale water providers and utilities, who rely on water supply stored in facilities maintained by the Corps of Engineers.¹

Water Supply

Over the decades, western States and the Corps of Engineers have butted heads when State water law has conflicted with federal programs and priorities, particularly when it comes to water supply. The problem can be illustrated with an analogy.² Think of a kitchen sink. There are usually two sides to the sink, with a divider in the center and a faucet that swings between each

¹ While I am not testifying in my capacity as a NWSA board member, the organization also has two policy positions related to this topic that are consistent with WSWC perspectives.
https://www.nationalwatersupply.org/_files/ugd/cdd48e_4144f6cb41d54011b9e821badec57a08.pdf.

https://www.nationalwatersupply.org/_files/ugd/cdd48e_fe818498d7f1430faf9ae446169460f6.pdf

See also, <https://www.nationalwatersupply.org/water-supply-rule>.

² For a different analogy regarding this same problem, see attached "Surplus Water and the Missouri River Moratorium," presented at the American Bar Association 31st Annual Water Law Conference, June 2013.

side. On one side, the drain is plugged. This is the Corps' storage reservoir. On the other side, there is no plug, which is the flowing river. The running faucet is the upstream river and surface runoff, which is controlled by mother nature. The Corps controls which side of the sink the faucet is running into by opening and closing the outflow of its reservoirs. Once the plugged side of the sink is full, the Corps must drain some of the water, or move the faucet to the uncontrolled, free-flowing side.

The Corps takes the position that ALL water in the sink is in storage and subject to their control and the fees they charge. The States take the position that the sink is in their own house and that even though the Corps gets to control which side of the sink is filling, it only gets to enter a water supply agreement or charge users when they take water from the plugged side of the sink. Water that is coming out of the faucet, before it gets to the sink – for example when you fill a glass – and water that flows into the open portion of the sink is the States' to appropriate.

The Corps bases its position on language in both the 1944 Flood Control Act and the 1958 Water Supply Act. Section 6 of the 1944 Flood Control Act allows the Corps to sell "surplus water," which the Corps loosely defines as reservoir water that is not required for an authorized purpose because the authorized need never developed or has changed, or water that could be more beneficially used as municipal and industrial water than for its authorized purpose and wouldn't affect other authorized purposes over some specified time period. To continue the sink analogy, if the water in the sink is supposed to be used to wash dishes, but you don't eat at home and so you don't have dishes, the Corps can sell that water for other uses as surplus water. Similarly, if someone wants a glass of water to drink or water plants, and more water will come out of the faucet before there's a need to wash dishes, the Corps can also sell that water as surplus, out of its side of the sink.

A problem unique to the Missouri River system regarding surplus water is that the water in the system has never been allocated to specific authorized purposes, and so the Corps is unable to make a determination of whether there is "surplus water." (To our knowledge, based on representations made by the Corps, all other reservoirs outside the Missouri River system have had their storage allocated to specific authorized purposes.) Imagine the frustration this caused in 2011, when the Missouri River was flooding downstream cities most of the summer, but the Corps was telling North Dakota that it was unsure whether there was "surplus water" available for use in the reservoir.

The Corps also has authority under the 1958 Water Supply Act. It states that storage may be included in Corps and Bureau of Reclamation reservoirs "for present or anticipated future demand or need for municipal or industrial water, and the reasonable value thereof may be taken into account in estimating the economic value of the entire project." The Act further places a condition that "before construction or modification of any project including water supply provisions for present demand is initiated, State or local interests shall agree to pay for the cost of such provisions." Again returning to the sink analogy, the Corps takes the position that because there is a sink in your house, the Corps is allowed to recoup initial construction and any subsequent repair costs no matter which side of the sink is being used. The States take the position that only if a State asks for a larger or upgraded sink, then the State is responsible for the extra cost.

After several years of the States' unsuccessful attempts to resolve their differences with the Corps over this issue, a provision in WRDA 2014 prohibited the Corps from charging surplus water fees in the Upper Missouri River Basin for 10 years.

Undeterred, in 2016, the Corps published its Proposed Water Supply Rule in the Federal Register (COE-2016-0016). Generally, the rule set forth the Corps' policies for interpreting its authorities under the 1944 and 1958 Acts, defined key statutory terms, and discussed water pricing mechanisms. The States had several issues with the proposed rule.

Despite the Corps' insistence that it sells "storage" (as opposed to selling water), the rule never defined "storage," nor do top officials agree on what that term even means. This is the fundamental crux of the States' disagreement with the Corps, and until this conflict is resolved, consensus remains unlikely. To the States, "storage" means the area on the plugged side of the sink, and there is general agreement that the Corps has the authority to charge for use of that storage space (except for in the Missouri River basin).³ However, the Corps continued to assert through the rule that all the water behind the reservoir is its to manage – in other words, the entire kitchen sink. In the rule, the Corps specifically stated that it was aware of North Dakota (and other States') position that "users should not be required to pay for benefits they do not receive," but the law "does not require the Corps to undertake such an analysis." The problem with this position is that in attempting to exercise control over the unplugged portion of the sink, the Corps is also usurping the States' role in appropriating its own water. In other words, the Corps is controlling who is allowed to take a glass of water from the parts of the system outside the plugged area of the sink. This is contrary to State water laws and the doctrine of cooperative federalism.⁴

Not only did the proposed rule require States to pay for benefits they do not receive, it usurped the States' rights and authority to control and allocate their own water resources and completely ignored multiple declarations from Congress that States are to have the primary responsibility for water supply and water management decisions. Congress and the courts have unequivocally established and repeatedly affirmed the doctrine of cooperative federalism regarding water management issues.

Further, different States have different water laws regarding the rules for filling the plugged portion of the sink. Some States only allow "one fill" per water season. This means that the plugged portion of the sink can be filled once at the beginning of the water year with the spring run-off, and that amount of water needs to last the year. Other States would allow the faucet to be switched between the plugged and unplugged portions of the sink freely, depending on stated variables. By claiming the entire sink for themselves, the Corps disregards these State law principles.

³ The pricing mechanisms and payment terms are likely the subject of additional conflict, but until the underlying definition of storage is resolved, those are problems for the future.

⁴ A more detailed technical and legal analysis can be found in the attachment labeled "Position Paper on Missouri River Allocations Within Corps' Reservoir Take Line Boundaries," dated October 2014.

There was bi-partisan opposition to Proposed Water Supply Rule from the Western States Water Council, Conference of Western Attorneys General, and Western Governors Association. There was bipartisan opposition to the rule from 19 Senators, including Senators Cramer and Merkley. Ultimately, the Proposed Water Supply Rule was withdrawn in 2020, though the underlying conflict remains unresolved.

The prohibition on fees was extended from 10 years to 12 years in Section 1138 of WRDA 2018, and further extended to 16 years in Section 306 of WRDA 2020. Most recently, Senator Cramer successfully incorporated Section 8388 into WRDA 2022, which permanently banned the Corps from charging surplus water fees from the Upper Missouri River Basin. While this solves a portion of the problem for some of our members, the larger problem regarding authority over water allocations remains.

Additionally, Major General Spellmon withdrew a policy (Guidance Letter No. 26), which prohibited the Corps from granting access to reservoirs until water storage agreements were executed. In North Dakota and South Dakota, the majority of the Missouri River contains reservoirs. Because of the conflict over whether water supply agreements were even necessary, Guidance Letter No. 26 meant in practicality that those States had no access to Missouri River water, the primary water supply source in both States. We are appreciative to General Spellmon for listening to our concerns and taking this positive step.

Western Water Cooperative Committee

WRDA 2022 established the Western States Cooperative Committee, which requires the Corps to annually meet with delegates from each of the Western States to develop and make recommendations to avoid or minimize conflicts between Corps projects and water rights and water laws of Western States and provide a written report to Congress. WSWC and CWAG are working diligently with their membership to facilitate committee appointments. Notably, the Corps has indicated it does not believe it can fulfill its obligation to participate in this committee without additional financial authorization. While there is no expectation the committee will be the end-all solution to States' conflicts with the Corps, there is hope that with this additional Congressional oversight, the Corps will take the "cooperative" portion of its cooperative federalism responsibilities more seriously.

Forecast Informed Reservoir Operations and Drought

Western States experience great variability in precipitation, with serious impacts and consequences for the operation of water projects, from maximizing water supply storage through multi-year droughts to flood control operations that protect life and property through intense storm systems. Optimizing operations at reservoirs to effectively manage through both of these extremes requires enhanced weather forecasting abilities, innovative strategies, necessary federal authority to enable flexibility while ensuring safety, and coordination across federal, state, tribal, and local agencies.⁵

⁵ WSWC Position #460, supporting the use of FIRO, https://westernstateswater.org/wp-content/uploads/2021/04/460_Forecast-Informed-Reservoir-Operations-Position_2021Mar25.pdf

Congress has authorized and appropriated funding for pilot projects of Forecast-Informed Reservoir Operations (FIRO), enabling the Corps to work with the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, the Bureau of Reclamation, and state and local agencies on a limited number of demonstration projects at reservoirs in California, the Pacific Northwest, the Upper Missouri River Basin, and the North Platte River Basin. These projects illustrate how water that would otherwise be released based on a fixed rule curve to create space in the flood control pool may instead remain in storage to help alleviate drought conditions, without compromising flood risk management.⁶

The California Department of Water Resources has noted that FIRO is a key water management tool that takes “advantage of scientific improvements in forecasting atmospheric rivers to better anticipate and manage large storm events while maximizing opportunities to increase water supply. Atmospheric rivers like those we’ve seen in January 2023 have a profound impact on water management in California.” The State and federal agencies and local entities have been working together on pilot projects at Lake Mendocino, the Prado Reservoir, Lake Oroville, and New Bullards Bar. “The use of a steering committee of key agency and science partners enabled a collaborative approach to developing strategies to maximize the benefit of a flexible storage and release schedule while improving flood mitigation benefits.... These pilot projects have demonstrated significant value for the U.S. Army Corps of Engineers to develop a program to evaluate using FIRO in all new water control manual updates. This superior level of coordination nurtures knowledge-sharing and improvements in tools and technologies.”⁷

WRDA 2018, Section 1222, directed the Corps to submit a report on the first pilot project to use FIRO operations in California (Coyote Valley Dam at Lake Mendocino and the Russian River Basin), with “an assessment of the viability of using [FIRO] at other dams owned or operated” by the Corps, identifying dams for future optimization or studies. WRDA 2020, Section 157, further directed the Corps to submit a report that identifies additional opportunities for applying FIRO across the United States, specifically naming the Upper Missouri River Basin and the North Platte River Basin.

One of the challenges of implementing FIRO response to drought conditions⁸ is the need to update the Water Control Manuals. These manuals, governed by Engineer Regulation (ER) 1110-2-240 and ER 1110-2-8156, specify how to balance the congressionally-mandated purposes of each reservoir, and should be updated at least every ten years. However, these updates compete for funding alongside all the other Corps Operations and Maintenance requirements. Recent

⁶ “Short- and Long-Term Solutions to Extreme Drought in the Western United States,” CRS Report (June 2022), <https://www.energy.senate.gov/services/files/EC3FC7B6-59DF-4944-8DA8-534D85A8D951>

⁷ “California’s Forecast-Informed Reservoir Operations Are Key to Managing Floods and Water Supplies,” CDWR Update (January 2016), <https://water.ca.gov/News/Blog/2023/Jan-23/Californias-Forecast-Informed-Reservoir-Operations-Are-Key-to-Managing-Floods-and-Water-Supplies>

⁸ “Army Corps of Engineers: Additional Steps Needed for Review and Revision of Water Control Manuals,” GAO Report (July 2016), <https://www.gao.gov/assets/gao-16-685.pdf>

explanatory statements in appropriations legislation⁹ have directed the Corps to apply specified funds from the Scheduling Reservoir Operations (SRO) line item to update water control manuals for non-Corps owned high hazard dams where: (1) the Corps has a responsibility for flood control operations under section 7 of the Flood Control Act of 1944; (2) the dam requires coordination of water releases with one or more other high-hazard dams for flood control purposes; and (3) the dam owner is actively investigating the feasibility of applying forecast-informed reservoir operations technology.

In WRDA 2022, section 8109, the Corps was authorized to update water control manuals for water resources development projects in States where the governor declared a statewide drought disaster in 2021, at the request of the governor, and prioritizing projects that include water supply or water conservation as an authorized purpose. The WSWC supports these continuing efforts to innovate and use forecast informed reservoir operations by public and private entities at all levels to maximize the effective and efficient use of our existing and future infrastructure to benefit our communities, economic prosperity, and our environment, while balancing and protecting our need for public health and safety.

Aging and Inadequate Infrastructure and Dam Safety

The arid Western States depend on an intricate and aging system of water infrastructure, including dams, reservoirs, and levees to store, manage, conserve, and deliver water supplies and control water during both floods and droughts. Existing and new infrastructure is critical to meet drinking water, municipal and industrial, hydropower, flood control, international treaty, and fish and wildlife habitat needs. This infrastructure is financed and maintained under a complex network of state, tribal, local, private, and federal ownership, benefiting a broad segment of water users. These systems frequently outlive their expected lifecycle by many decades, but require thoughtful planning for future safety and continued operation. Instead, much of our nation's water infrastructure is deteriorating due to underfunded and deferred maintenance and repair. Substantial and sustained investments in water project construction, maintenance, rehabilitation, and replacement are necessary. Existing state, local, and federal programs to finance these projects are crucial, but have been insufficient to meet our water quality and water resources management challenges.¹⁰

The WSWC supports continued and increased funding across all dam safety programs, including Corps Water Infrastructure Financing Program (CWIFP), and supports federal legislative and administrative actions that provide a continuous funding stream for maintenance, repair, and rehabilitation or replacement of local, state, and federal dams and related infrastructure. The WSWC supports the creation and maintenance of dedicated water infrastructure funding through special accounts with dedicated receipts to be promptly appropriated for authorized purposes, as well as a variety of grant, loan, credit enhancement, and other financial incentive programs to help meet diverse needs at all scales.

⁹ See, e.g., FY2020, 165 Cong. Rec. H11233 (2019); FY2022, 168 Cong. Rec. H2225 (2022)

¹⁰ See WSWC Positions #448, 462, <https://westernstateswater.org/resolutions-summary/>

The long-awaited CWIFP, expected to launch in Spring 2023, provides long-term, low-cost loans for maintaining, upgrading, and repairing non-federal dams listed in the National Inventory of Dams (NID). Notably, the Corps has indicated that around 16,000 of the dams in the NID are identified as high hazard potential dams, meaning that in the event of a failure or mis-operation of the dam, the subsequent damage is likely to include loss of life. Congress has appropriated \$81M to leverage \$7.5B in loans to help meet this need.

The WSWC also supports a method of congressional budget scoring that considers the unique timing of the costs and benefits of water infrastructure investments, and accounts for long-term public health and safety, economic and environmental benefits, with fair and appropriate discounting.

Data for Water Allocation, Supply, and Demand

WRDA 2020, section 158, authorized a “study on the ability of Federal agencies to coordinate with other Federal agencies, State and local agencies, Indian Tribes, communities, universities, consortiums, councils, and other relevant entities with expertise in water resources to facilitate and coordinate the sharing among such entities of water allocation, supply, and demand data, including: (a) any catalogs of such data; (b) definitions of any commonly used terms relating to water allocation, supply, and demand; and (c) a description of any common standards used by those entities.” The Corps was directed to work with the National Academy of Sciences and submit a report to Congress on the results of the study, with “recommendations for ways to streamline and make cost-effective methods for Federal agencies to coordinate interstate sharing of data, including recommendations for the development of a publicly accessible, internet-based platform that can allow entities described in paragraph (1) to communicate and coordinate ongoing data collection efforts relating to water allocation, supply, and demand, and share best practices relating to those efforts...”

The WSWC has long supported water data programs at federal and state levels, advocated for increased funding for essential water science and monitoring data programs, and encouraged greater data-sharing and transparency among its own member states. States allocate and administer rights to the use of water in the West and are therefore in the best position to provide data on water rights and water use. However, water rights, uses, and associated data are managed separately and distinctly by each state, which makes regional analysis cumbersome. Analyses across regions and multi-state basins are becoming increasingly relevant, especially given the unprecedented drought and population growth that the West is experiencing. With changing and ever-greater demands on limited water resources, complicated by an increasingly complex overlay of federal laws and regulations, the importance of cooperative efforts and exchanges by and among states has likewise been magnified.

To address this challenge, Water Data Exchange (WaDE) program (begun in 2011) created a database and application programming interface (API) to streamline sharing of water rights and water use data via standardized and machine-readable formats. Making this data accessible enables users to answer regional and national questions about water availability, scarcity, and resilience in a cost-effective, sustainable, and consistent way. The WaDE program is made possible through funding from various state and federal agencies, private philanthropic funding, and in-kind support

through participation from our member States that committed staff and resources, as well as sharing their water data, without which WaDE would not be possible.

On April 25, 2023, the WSWC kicked off the public release of its Western States Water Data Access and Analysis Tool (WestDAAT),¹¹ the latest phase of the WaDE program. WestDAAT provides user-friendly access to data, where available in machine-readable format, for over 2.2 million water rights across the West. At present, WestDAAT includes a number of filters that can be used to visualize the data by owner, point of diversion, place of use, priority date, beneficial use (purpose), source of supply (surface water or groundwater), permitted flow or volume, and basin or watershed.

WSWC appreciates the efforts of various federal agencies that have worked with the WaDE program, including the Environmental Protection Agency, the Department of Energy, the U.S. Geological Survey, and the Bureau of Reclamation. We look forward to the results of the Corps congressionally-directed study on data for water allocation, supply, and demand, and hope to find greater synergy as we learn to share data across platforms.

Expediting Hydropower and Energy and Water Conservation

WRDA 2022, section 8123, directs the Corps to increase the development of hydroelectric power at projects with existing facilities, and develop new hydroelectric power at nonpowered projects. Hydropower is a prominent component of electricity generation in a number of our Western States, and is the primary source of renewable energy in the United States. The WSWC supports hydropower projects that enhance our electric generation capacity and promote economic development, while appropriately protecting environmental resources, the rights of existing water and power users, and respect State's authority over water allocation and CWA section 401 certification authority. Further, the WSWC supports the development and implementation of appropriate energy and water conservation programs at all levels to minimize demands placed on our natural resources and ecosystems.¹²

Intergovernmental Collaboration

The WSWC strongly supports collaboration and leadership at all government levels – federal, state, tribal, and local – and the private sector – to address the Nation's infrastructure needs and establish water infrastructure improvements as a public policy priority.

One example in WRDA 2022 is the Secretary of the Army's expanded authority (section 8106), at the request of the non-Federal interests, as part of the scope of feasibility studies to formulate alternatives to maximize net benefits from the reduction of the comprehensive flood risk that is identified through a holistic evaluation of the isolated and compound effects; including water supply, water conservation, and drought risk reduction benefits.

¹¹ <https://westdaat.westernstateswater.org/>

¹² See WSWC Position #479, https://westernstateswater.org/wp-content/uploads/2022/04/479_Renewable-Hydropower-Development_2022Apr6.pdf

Another is section 8119, Planning Assistance to States, authorizing the Secretary to carry out activities, at full Federal expense – “to inform and educate States and other non-Federal interests about the missions, programs, policies, and procedures of the Corps of Engineers; and to engage with States and other non-Federal interests to identify specific opportunities to partner with the Corps of Engineers to address water resources development needs.” The Secretary is directed to designate staff in each district office to provide such assistance. There is always an important role for the States in the conduct of appraisal investigations and feasibility studies, preparation of feasibility reports, and identifying funding sources.

Section 8104, Floodplain Management Services, specifically directs the Secretary to identify specific opportunities to partner with the Corps to address flood hazards. Opportunities exist to leverage non-federal funding through federal loan guarantees and other financial instruments that access private sources of financing. Planning and continuing compliance with state water laws and interstate compacts is also vital.

Section 8150 created a Non-Federal Interest Advisory Committee comprised of members representing interests related to harbors, including inland harbors, flood and coastal storm risk management, aquatic ecosystem restoration, as well as inland waterborne transportation, water supply, recreation, hydropower, and emergency preparedness stakeholders. In addition, it would include representatives with expertise in conservation, environmental policy, and rural water resources.

The Western Water Cooperative Committee provisions in section 8158 are addressed above.

Under section 8208, the Secretary was directed to “‘consult’ with applicable Federal, State, and local agencies; Indian Tribes; non-Federal interests; and other stakeholders, as determined appropriate in the conduct of a comprehensive study to evaluate the effectiveness of carrying out additional measures, including measures that utilize natural features or nature-based features at or upstream of reservoirs for the purposes of – (1) sustaining operations in response to changing hydrological and climatic conditions; (2) mitigating the risk of drought or floods, including the loss of storage capacity due to sediment accumulation; (3) increasing water supply; or (4) aquatic ecosystem restoration.... [T]he Secretary shall include all reservoirs owned and operated by the Secretary and reservoirs for which the Secretary has flood control responsibilities under section 7 of the Act of December 22, 1944....”

An integrated, collaborative, and grassroots approach to water resources management is critical to the environmentally sound and efficient use of our water resources in the arid West. States, federal agencies, tribes, and local communities should work together to identify water problems and develop optimal solutions at the lowest appropriate level. Striving for cooperation rather than litigation, we must recognize and respect national, state, regional, local, and tribal differences in values related to water resources. State primacy is fundamental to a sustainable water future. Federal water planning, policy development, regulation, protection, and management must recognize, defer to, and support state water laws, plans, policies, programs, water rights administration, adjudication, and regulation, compacts, and settlements. Rather than attempt to dictate water policy, the federal government should engage states early in meaningful consultation

and contribute its fair share of funding to support implementation of state water planning and management, thus avoiding, or at least minimizing, the need for federal regulatory mandates.¹³

Drought Authorities

On July 28, 2022, Assistant Secretary of the Army (Civil Works) Michael Connor issued a memorandum¹⁴ directing the Corps to provide a comprehensive brief to his office regarding the ongoing, planned, and potential civil works actions that can further drought resilience at local and regional scales. He noted the increasing trend of extreme drought across the nation and expressed the need for the Corps to use its existing authorities and programs to support drought resilience, particularly in the drought-prone western U.S. The memo on drought resilience described several examples of programs and policies already in place, then went on to describe advancements needed to integrate solutions as part of a whole-of-government approach in areas such as: (1) collaborative agreements with federal, state, and local agencies; (2) additional FIRO pilot projects; (3) water supply proposals and requests, particularly those integrating managed aquifer recharge features; (4) technical assistance to states under the Planning Assistance to States (PAS or “section 22”) program; (5) working with tribal nations under the Tribal Partnership Program or other authorities; (6) emergency response and recovery assistance for drought and wildfires to help stabilize watersheds; and (7) improving permitting timelines for facilities and infrastructure important to drought resilience strategies.

We appreciate the opportunity to testify on these important efforts and look forward to continuing to work with the Assistant Secretary’s office and the Corps of Engineers.

¹³ <https://westernstateswater.org/mission/>

¹⁴ <https://api.army.mil/e2/c/downloads/2022/07/28/3f0183ec/asacw-guidance-on-drought-28jul2022.pdf>

POSITION PAPER ON MISSOURI RIVER ALLOCATIONS WITHIN CORPS' RESERVOIR TAKE LINE BOUNDARIES
PREPARED BY NORTH AND SOUTH DAKOTA IN COOPERATION WITH ASA AND USACE
OCTOBER 2014

Introduction

In Spring 2010, the Corps of Engineers began implementing Real Estate Policy 26. The policy states "no easement that supports any type of water supply agreement will be executed prior to the water supply agreement being executed by all parties." The Corps takes the position that any water removed from within a Corps take boundary requires a water supply agreement. The States¹ take the position that a water supply agreement is only necessary when water is taken out of storage from the reservoir. Stated another way, the Corps believes that all water within a reservoir boundary is part of storage; whereas the States believe dam systems are comprised of both stored water and natural stream flow components.

The overall purpose of this paper is to provide the ASA and Corps with an explanation of how the States' position is compatible with legal authority and the Corps' overall system of reservoir operations. While this paper focuses specifically on the Missouri River reservoir system, the States are mindful of the ASA and Corps' desire to have a nationwide water supply agreement policy. Though versed in neither the details of how other reservoir systems operate nor other states' specific laws, the States have attempted to present a system believed to be workable throughout at least the western states and possibly nationwide.

This paper first contains a section describing various definitions that are important to the overall context of the discussion. Following that is a brief description of historical background and legal

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**Various portions of this paper were taken from Jennifer L. Verleger and Michelle A. Klose, *Surplus Water and the Missouri River Moratorium*, 31st Annual Water Law Conference, June 5-7, 2013.

¹ For purposes of this document, the "States" means North Dakota and South Dakota.

authorities. Next, the paper articulates the unique nature of the Missouri River reservoir system. This background will lead to a discussion of the Missouri River Mainstem Reservoir System Master Water Control Manual (Master Manual), which describes water management and operation on the mainstem Missouri River. Finally, the prior appropriation system will be discussed. Several examples will be used to illustrate the appropriate use of water supply agreements within the prior appropriation states.

Definitions

Three sets of definitions are fundamental to the context of the overall discussion. Further, the differences between the definitions in each set must be understood. The sets are volume versus flow, capacity versus storage, and natural flow versus storage. Once the differences between the terms are clarified, the relationship between flow and storage can be explored.

Volume versus Flow

Volume and flow are often confused when discussing water resources. Volume refers either to the three-dimensional space that a substance occupies or the three-dimensional space contained within a boundary or container. An example of this is the amount of space contained within a measuring cup, which could also be referred to as the measuring cup's capacity. Volume is measured in units of cubic length, such as cubic feet or cubic meters, though terms like cup, pint, gallon, acre-feet, or liter are often used. Regardless of how a volume is labeled, the fundamental unit originates from cubic length.

An extension of volume is flow (sometimes called a flow rate or volumetric flow rate). Flow refers to a volume that passes a certain point per unit of time. The fundamental difference between volume and flow is that flow accounts for time, while volume does not. The measurement of volume per time (flow) is often expressed in terms of cubic feet per second (cfs), cubic meters per second, gallons per minute, or acre-feet per day.

Capacity versus Storage

As discussed above, volume and capacity are sometimes used interchangeably. Confusion sometimes results because often the terms capacity and storage are incorrectly used interchangeably. These two concepts are very different. The confusion likely occurs because sometimes capacity is referred to as storage capacity, which then gets shortened to storage.

Capacity is the volume of the container or the amount that a given container can hold and does not fluctuate unless there is a physical modification. Storage, however, is the amount in the container

at any given time. Storage does fluctuate. For example, a one gallon container holding milk has a capacity of one gallon. As the milk is consumed, storage in the container decreases.

Another example can be seen in Figure 3 (infra), which shows the Missouri River Mainstem Capacity Zones. Ignoring the effects of sedimentation, the capacity of the reservoir system is a constant 72.4 million acre-feet. But the storage of the system fluctuates continuously, as shown by the indications of the historic minimum in 2007, and the historic maximum in 2011.

Natural Flow versus Storage

Natural flow is a concept of a volume of water moving past a point along a river that is not augmented by artificial releases from storage.

Storage is the removal of water from natural flow to hold for a period of time. Storage typically occurs on an annual basis, filling storage reservoirs during spring run-off. Releases are typically made from storage in the summer and fall to augment natural flows. At the end of a year, there may be storage carryover into the subsequent year.

Not all storage is off-stream of a river system. Storage can also be on-stream within the river system. Within the States, on-stream and off-stream storage are viewed similarly; the location of the reservoir does not determine storage rights to the natural flows.

Relationship between Flow and Storage

As discussed above, both flow and storage fluctuate with time and conditions. When examining the river and reservoir system, these two concepts are interdependent. The Missouri River is a wildly fluctuating force of nature. The variation of flows and the catastrophic flooding those flows can cause are the primary reason the dam system was constructed. Though the flow in the river has been modified and somewhat tamed by the six main stem dams, it still varies seasonally with the prairie snowmelt generally beginning in March, followed by the mountain snowmelt around June, and supplemented by rains that occur during spring through fall. The dams, however, store these peak flows and release this storage over time as the river can accommodate the additional flow.

Analyzing this system in more depth reveals that water flows into a reservoir at the same time that water passes through a dam's outlet. Water flowing into a reservoir is commonly referred to as inflow, and water passing through a dam's outlet is commonly referred to as outflow. For inflow to reach a dam and become outflow, there is a flow component through the reservoir. In addition to flow, a reservoir may hold or impound a certain volume of water - the storage. In other words, a reservoir

simultaneously has a volume component and a flow component. This will be illustrated with the following three examples.

Example 1: (Inflow = 500 cfs, Outflow = 500 cfs, Storage = 1,000 acre-feet).

Suppose that at a certain point in time a reservoir impounds 1,000 acre-feet of water. 500 cfs is flowing into the reservoir, and 500 cfs is passing through the dam. Because the inflow and outflow are the same, the volume of the water impounded by the dam does not change; it remains at 1,000 acre-feet. Water has not been added or removed from the storage, yet there was both inflow and outflow, and therefore flow through the reservoir. This flow is the river flowing beneath the impounded volume of water.

Example 2: (Inflow = 500 cfs, Outflow = 700 cfs, Storage = 1,000 acre-feet).

Now suppose that a reservoir at a certain point in time impounds 1,000 acre-feet and the inflow is 500 cfs, but the outflow is 700 cfs. Because the outflow is greater than the inflow, the volume of stored water will decrease. The 700 cfs outflow is comprised of two components: (1) the 500 cfs inflow flowing through the reservoir, and (2) a portion of the impounded volume that has been transformed to a flow. Specifically, water is removed from the impounded volume, or removed from storage, at a flow rate of 200 cfs (700 cfs minus 500 cfs). The new storage volume depends on how long water is released from storage at the rate of 200 cfs. If this situation continued for one hour, the new stored volume would be 983.5 acre-feet.²

Example 3: (Inflow = 700 cfs, Outflow = 500 cfs, Storage = 1,000 acre-feet).

As a final example, suppose the inflow is greater than the outflow. Now the reservoir impounds 1,000 acre-feet, the inflow is 700 cfs, and the outflow is 500 cfs. Because the inflow is greater than the outflow, the impounded volume of water increases. In this example, instead of removing water from storage, water is added to the impounded volume at a rate of 200 cfs. After one hour, the impounded volume would be 1,016.5 acre-feet.

The relationship between flow and volume is ever-changing and will vary dramatically in different parts of the country. While some dams located on intermittent streams only have a flow component for part of the year, the Missouri River constantly flows in, through, and out of the reservoirs.

² 1,000 acre-feet – (1 hour * 200 cubic feet/second * 3600 seconds/hour * 1 acre-foot/43,560 cubic feet)
= 1,000 acre-feet – 16.5 acre-feet = 983.5 acre-feet.

The Corps' position is any water within a Corps take boundary of its reservoir is storage and requires a water supply agreement. The States' position is that the Missouri River natural flow is available to the people of the basin without the need of storage in the reservoirs. Because this flow is available for use in the basin, the basin states and tribes have the right to appropriate this natural flow without interference by the federal government.

Historical Background and Legal Authorities

The Missouri River enjoys a storied legal history. While numerous federal and state legal doctrines, authorities, and cases all impact the Missouri River system, the following discussion is briefly limited to those areas that most directly impact the water supply agreement issue: states' rights, the 1944 Flood Control Act, the O'Mahoney-Milliken Amendment, the Water Supply Act of 1958, and sovereign land doctrine.

States' Rights

Each state has its own way of addressing water use and control. In the Enabling Act, Congress provided for the people of the Dakota Territory to form constitutions and state governments and be admitted into the union on an equal footing with the original states.³ In North Dakota, the constitution provides that "[a]ll flowing streams and natural watercourses shall forever remain the property of the state for mining, irrigating and manufacturing purposes."⁴ This constitutional language was adopted through the Enabling Act by proclamation of the President when North Dakota was declared a state in 1889.⁵ "A right to appropriate water can be acquired for beneficial use only as provided in [chapter 61-04]. Beneficial use shall be the basis, the measure, and the limit of the right to the use of water."⁶

In South Dakota, water ownership is addressed statutorily: "It is hereby declared that all water within the state is the property of the people of the state, but the right to the use of water may be acquired by appropriation as provided by law."⁷ Further, "the people of the state have a paramount interest in the use of all the water of the state and that the state shall determine what water of the state, surface and underground, can be converted to public use or controlled for public protection."⁸

³ Enabling Act of 1889, 25 Stat. 676, ch. 180.

⁴ N.D. Const. art. XI, § 3.

⁵ See Enabling Act of 1889, 25 Stat. 676, ch. 180, § 8.

⁶ N.D.C.C. § 61-04-01.2.

⁷ S.D. Codified Laws § 46-1-3.

⁸ S.D. Codified Laws § 46-1-1.

Throughout history, Congress and the Supreme Court have spoken with a clear and consistent voice regarding state deference with respect to water allocation. As the Court observed in the landmark *California v. United States* decision:

The history of the relationship between the Federal Government and the States in the reclamation of the arid lands of Western States is both long and involved, but through it runs the consistent thread of purposeful continued deference to state water law by Congress.⁹

As one example of this deference, the Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Department of Agriculture, Fish and Wildlife Service, Forest Service, and Park Service currently hold a combined total of 195 conditional or perfected water permits in North Dakota.¹⁰

1944 Flood Control Act

The 1944 Flood Control Act established policies relating to flood control and authorized the construction of thousands of dams and levees across the country.¹¹ The Act established a Missouri River Basin program to manage the Missouri River and its dams with eight authorized purposes: flood control, navigation, hydropower, water supply, irrigation, water quality, recreation, and fish and wildlife.¹²

Section 6 of the 1944 Flood Control Act allows the Corps to sell surplus water.¹³ The Corps defines surplus water as:

- (1). Water stored in a Department of Army reservoir that is not required because the authorized need for the water never developed or the need was reduced by changes that have occurred since authorization or construction.
- (2). Water that would be more beneficially used as municipal and industrial water than for the authorized purpose that, when withdrawn, would not significantly affect authorized purposes over some specified period.¹⁴

The States view the language of the 1944 Flood Control Act as consistent with our position that water within a reservoir boundary is a combination of stored water and pass-through natural flows. The stored water is subject to reallocation and a determination that it is surplus. The natural flow is not stored and not subject to reallocation or determination that it is surplus.

⁹ 438 U.S. 645, 653 (1978).

¹⁰ See North Dakota State Engineer permit database.

<http://www.swc.state.nd.us/4dlink7/4dcgi/permitsearchform/Permits>

¹¹ Pub. L. No. 534, 58 Stat. 887, 33 U.S.C.A. § 701-1.

¹² *Id.*, § 9.

¹³ *Id.*, § 6.

¹⁴ *U.S. Army Corps of Engineers Water Supply Handbook* (Dec. 1998) pp. 2-7 – 2-8.

O'Mahoney-Milliken Amendment

The very first lines of the 1944 Flood Control Act, known as the O'Mahoney-Milliken Amendment, state:

[I]t is hereby declared to be the policy of the Congress to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control, as herein authorized to preserve and protect to the fullest possible extent established and potential uses, for all purposes, of the waters of the Nation's rivers.¹⁵

It is not appropriate to view the O'Mahoney-Milliken Amendment as simple intent language. It is part of the law and must be respected. Several states fought hard for the language to be included and would not have voted for approval of the 1944 Flood Control Act without it. Governor Moses of North Dakota argued that without the language, the upper basin states would be "a province, a colony; a hinterland to serve the economic needs of the lower-basin States."¹⁶ Governor Ford of Montana testified that the upper basin states "are not satisfied with just having the dams; we want the right to the use of the waters behind those dams."¹⁷ Governor Ford went on to recommend that the entire Missouri River Basin provision be removed from the 1944 Flood Control Act if the protections of the O'Mahoney-Milliken Amendment were not included.¹⁸ Finally, Colorado Senator Milliken supported the amendment "by citing and explaining the Acts of 1866, 1877 and 1902, all of which granted special status to state law in water matters."¹⁹ Milliken also cited the Denison Reservoir Act, "which specifically gave priority to state law in water impounded in a federal dam."²⁰

As evidenced, the O'Mahoney-Milliken Amendment was something that many states took seriously and believed was required to be included in the 1944 Flood Control Act. Not only was the language important for passage of that Act, but Congress reiterated its commitment to the O'Mahoney-Milliken Amendment by repeating the language in the Rivers and Harbor Act of 1945.²¹ Both Acts

¹⁵ Pub. L. No. 534, § 1.

¹⁶ John P. Guhin, *Law of the Missouri*, 30 S.D. L. Rev. 395 (1985) (quoting *Flood Control: Hearings on H.R. 4485 Before the Subcommittee of the Committee on Commerce, United States Senate* 541 (1944) [hereinafter cited as *House Hearings on 4485*]).

¹⁷ *Id.* (quoting *House Hearings on 4485* at 544).

¹⁸ *Id.* (citing *House Hearings on 4485* at 544).

¹⁹ *Id.* (citing *House Hearings on 4485* at 723).

²⁰ *Id.* (citing *House Hearings on 4485* at 722-23).

²¹ Pub. L. No. 79-14, 59 Stat. 10.

further recognize the difference between the east and west by specifically protecting beneficial uses of water in states west of the ninety-eighth meridian.²²

Water Supply Act of 1958

The Water Supply Act of 1958 also begins with Congressional recognition of state primacy over water.

It is declared to be the policy of the Congress to recognize the primary responsibilities of the States and local interests in developing water supplies for domestic, municipal, industrial, and other purposes and that the Federal Government should participate and cooperate with States and local interests in developing such water supplies in connection with the construction, maintenance, and operation of Federal navigation, flood control, irrigation, or multiple purpose projects.²³

The Act goes on to state that storage may be included in Corps/Reclamation reservoirs “for present or anticipated future demand or need for municipal or industrial water, and the reasonable value thereof may be taken into account in estimating the economic value of the entire project.”²⁴ The Act further places a condition that “before construction or modification of any project including water supply provisions for present demand is initiated, State or local interests shall agree to pay for the cost of such provisions.”²⁵ Based on this authority and that granted in Section 6 of the 1944 Flood Control Act, the Corps states it has the authority to enter into water supply agreements with any entity that wishes to take water from within the take line boundary.

The States’ position is consistent with the Water Supply Act of 1958 in that if water supply is unavailable from natural flows, additional water supply from storage may be necessary. The portion of the water supply from storage used to augment natural flows should have a water supply agreement.

Sovereign Land Doctrine

States generally own title to the beds of their navigable rivers and lakes. This doctrine has deep historical roots. Upon achieving independence from Great Britain, each American colony became sovereign. As such, the colonies held, just as the British Crown did, “absolute right to all their navigable

²² Pub. L. No. 534, 58 Stat. 887, 33 U.S.C.A. § 701-1(b); *Id.*

²³ 43 U.S.C.A. § 390b(a).

²⁴ 43 U.S.C.A. § 390b(b).

²⁵ *Id.*

waters, and the soils under them.”²⁶ New states admitted to the Union were entitled to the same rights as those held by the original states.²⁷ They were entitled to become a state on an “equal footing” with the original states, and hence title to the beds of navigable waters is founded on the constitutionally moored equal footing doctrine.²⁸ To honor the doctrine, the United States held the beds of navigable waters in trust for the future states.²⁹

States “gained title to the lands under navigable waters as an incident of sovereignty,”³⁰ “as an incident of statehood.”³¹ These lands come to the state not as a gift from the federal government, but were a grant “conferred . . . by the Constitution itself.”³² Because the state owns the lands “by virtue of its sovereignty,”³³ the beds of navigable rivers and lakes are often referred to as “sovereign lands.” State title to the beds of navigable waters was confirmed by Congress in the 1953 Submerged Lands Act.³⁴

Because the Missouri River was navigable in 1889, the States took title to its bed when they were admitted to the United States. When the Corps condemned land to build the reservoirs, they did not take the sovereign land from the states. The States continue to own this land in fee, including the water within the original river channel, and have the rights of access and use.

Missouri River System

This section of the paper will examine some specifics of the Missouri River system because it is important to understand the unique characteristics of the basin. The Corps would like to adopt a consistent water supply agreement policy nationwide. While consistency in policy application is desirable, such a policy must be flexible enough to recognize and accommodate the distinctive circumstances found throughout the country. Three such circumstances make the Missouri Basin notable: the mix of water law doctrine within the basin, the sizes of the reservoirs, and the purposes for which the dams were constructed.

²⁶ *Idaho v. Coeur d'Alene Tribe*, 521 U.S. 261, 283 (1997) (quoting *Martin v. Waddell's Lessee*, 41 U.S. (16 Pet.) 367, 410 (1842)).

²⁷ *Id.*

²⁸ *State ex rel. Sprynczynatyk v. Mills*, 523 N.W.2d 537, 539 (N.D. 1994) (“*Mills I*”).

²⁹ *Idaho v. Coeur d'Alene Tribe*, 521 U.S. 261, 283 (1997); *Montana v. United States*, 450 U.S. 544, 551 (1981).

³⁰ *State v. Loy*, 20 N.W.2d 668, 671 (N.D. 1945).

³¹ *101 Ranch v. United States*, 714 F. Supp. 1005, 1013 (D.N.D. 1988), *aff'd*, 905 F.2d 180 (8th Cir. 1990).

³² *Oregon ex rel. State Land Bd. v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 374 (1977).

³³ *Mills I*, 523 N.W.2d at 540.

³⁴ 43 U.S.C. § 1311.

Mix of Riparian and Prior Appropriation Doctrines

The Missouri River Basin is comprised of ten states, and the river itself flows through or borders seven of those states.³⁵ Of those seven states, Montana, North Dakota, South Dakota, Nebraska, and Kansas all regulate water under the prior appropriation system.³⁶ Iowa and Missouri regulate water under the riparian system.³⁷ The Missouri River is roughly the dividing line between the riparian states and the prior appropriation states; no other major watershed in the country encompasses two different appropriative legal regimes that must be respected. In riparian states, reasonable use of the water belongs to the riparian owners. This means the Corps, as the riparian owner, would have a user interest in the water captured by its reservoirs. The prior appropriation states, in contrast, do not vest user rights based on land ownership. Therefore, the Corps would have no user interest in the river flowing through the reservoir in prior appropriation states unless it has been granted those rights by the state. Additionally, because water belongs to the state under prior appropriation systems, those states generally track water use. In contrast, riparian states tend not to monitor water use because the water lawfully belongs to the landowners.

Size of Reservoirs

The three upstream reservoirs (Fort Peck, Garrison, Oahe) on the Missouri River are the three largest Corps dams in the country. See Figure 1. The storage capacities of Fort Peck, Garrison, and Oahe are 18.7 million acre-feet (MAF), 23.8 MAF, and 23.1 MAF, respectively.³⁸ For comparison, the next largest Corps dam is Sam Rayburn Dam in Texas, with a capacity of 6.3 million acre-feet.³⁹

More importantly, because of the size of the reservoirs and the Corps' Real Estate Policy 26 implementation, river access in the States has been severely restricted. As seen in Figure 2, approximately 75% of the river through North Dakota and South Dakota can no longer be accessed due to the Corps' new policy position.⁴⁰ Also of critical importance and illustrated by Figure 2 is the fact that access to the river for the Fort Berthold, Standing Rock, Cheyenne River, Lower Brule, Crow Creek, and

³⁵ Wyoming, Colorado, and Minnesota are located in the Missouri River Basin, but the river itself does not flow through those states.

³⁶ <http://www.ncsl.org/issues-research/env-res/state-water-withdrawal-regulations.aspx#>

³⁷ *Id.*

³⁸ Master Manual, Revised March 2006, Plate II-1.

³⁹ National Inventory of Dams - <http://geo.usace.army.mil/pgis/f?p=397:1:0>

⁴⁰ Although not shown directly in the graphic, the number of blocked river miles in North Dakota is 262/354 (74%) and the number of blocked river miles in South Dakota is 375/483 (78%).

Santee Sioux tribal reservations has been completely restricted by this policy. The Yankton reservation has also had its access restricted in approximately the northern half of the reservation.

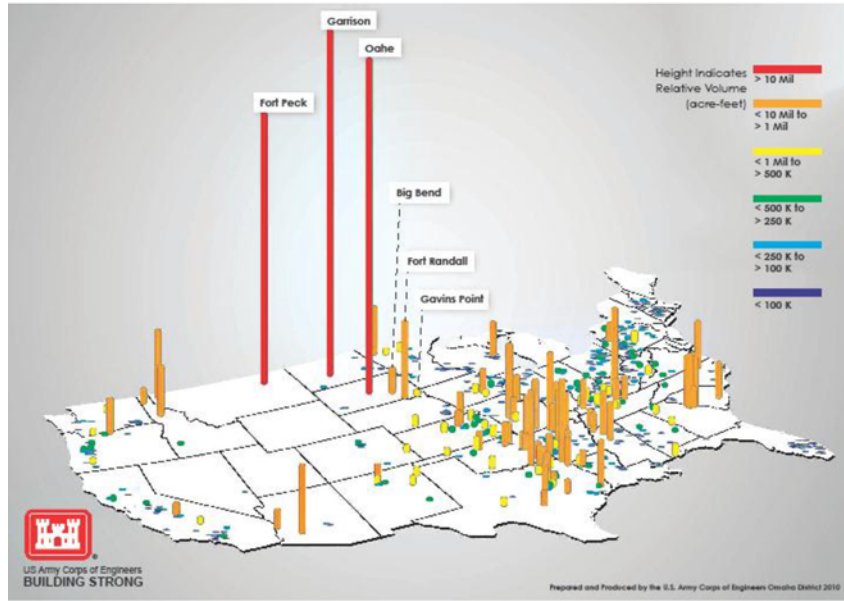


Figure 1: Relative Storage Capacity of Corps' Reservoirs
 Source: North Dakota State Water Commission, adapted from Corps' graphic

Purpose for which Dams were Built

In most of the country, the Corps has constructed dams to help with additional water supply needs. While water supply is one of the authorized purposes, the natural flow of the Missouri River provided abundant water supply prior to dam construction and still does. While the upstream states have benefited from the dams in the form of flood control, hydropower, and recreational activities, this has come at great sacrifice. Instead, the Missouri River dams were built mostly to the detriment of the upstream states. As time has passed, the benefits of the system have mostly accrued downstream. Not only were hundreds of thousands of acres flooded and thousands of people displaced, particularly the tribes, but the highly fluctuating nature of the reservoirs causes difficulty with locating water supply intakes and recreational facilities and contributes to erosion of reservoir banks, which results in losses of land and artifacts with cultural or historical significance. When reservoir water levels are drawn down,

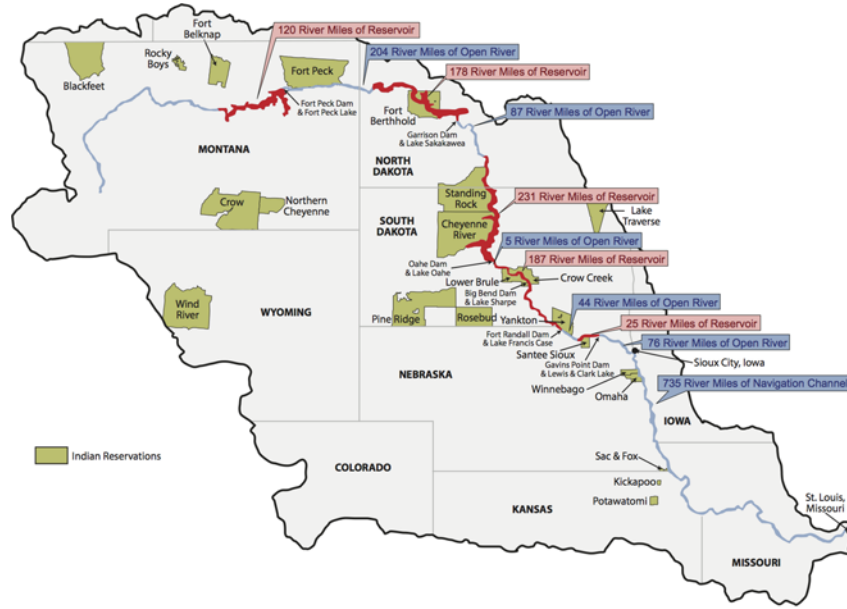


Figure 2: Missouri River Basin Illustrating Tribal Reservations, Reservoir Miles, and Open River
Source: Compiled by North Dakota State Water Commission

water quality is degraded. Owners of floating water intakes, which are commonly used by irrigators on the reservoirs, have increased costs caused by responding to changing water levels. The reservoirs also trap sediment that would have historically been carried downstream and contributed to important geomorphic processes. Finally, the upstream ends of reservoirs cause the creation of deltas, which continuously grow, acting as an obstruction in the river channel and increasing the risk of flooding.

Master Manual Review

Not only is the Missouri River a complex and unique system, it is governed by the often contentious Master Manual. The Corps' six multi-purpose dams - Fort Peck, Garrison, Oahe, Big Bend, Fort Randall, and Gavins Point - and reservoirs impounded behind each comprise the Missouri River Mainstem Reservoir System (Mainstem System). The Corps operates the dams as an integrated system to obtain the multi-purpose benefits for which the reservoirs were authorized and constructed. Yet as illustrated in the examples above, the inflow, outflow, and storage of each reservoir is constantly changing. The operation of an individual dam impacts operation at each of the other dams.

The Mainstem System is regulated by the Master Manual, which was most recently revised in 2006. The Master Manual is designed to manage water held in the reservoirs for the eight authorized project purposes of flood control, navigation, hydropower, water supply, irrigation, water quality, recreation, and fish and wildlife. In addition, operation of the Mainstem System must also comply with other applicable Federal statutory and regulatory requirements.

The Master Manual serves as a guide to the Corps in meeting the operational objectives of the system and fulfilling the authorized purposes. Of the eight authorized purposes, only flood control benefits from having vacant capacity available, while the other seven purposes benefit when the reservoirs are full. The reservoirs are separated into multiple zones: permanent pool, carryover multiple use, annual flood control and multiple use, and exclusive flood control (Figure 3).

The Missouri River Basin Water Management Division's operation and management strategy of the reservoir system is guided by the Master Manual and is based on a combination of system storage levels and calendar date trigger points. Capacity in the Mainstem System is not designated for any specific authorized purpose, excluding flood control, which requires empty capacity.

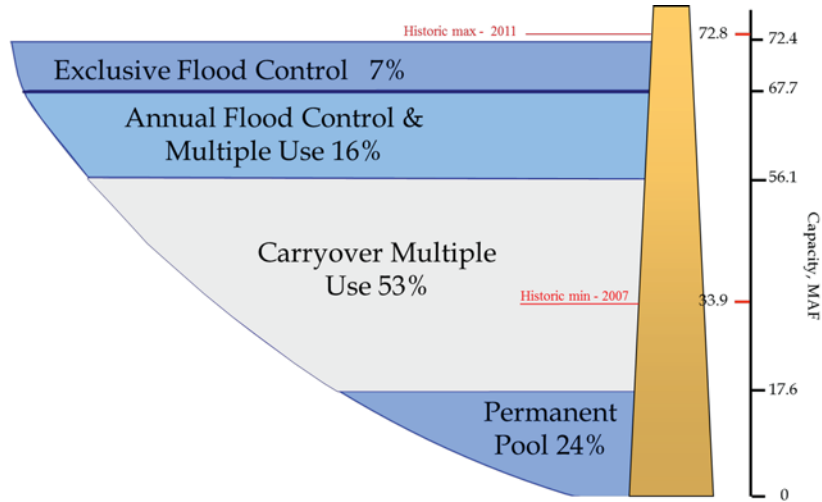


Figure 3: The Missouri River Mainstem System capacity zones
 Source: North Dakota State Water Commission, adapted from Corps' graphic by modifying y-axis label from incorrect use of storage for correct term capacity.

Operation of the Mainstem System for Flood Control

The Master Manual does not allocate specific blocks of capacity for any particular authorized purpose except flood control. Instead, the Mainstem System is operated on a combination water level/time of year system to supply the other seven purposes. The Mainstem System operation is dictated by the total combined amount of water in the reservoirs, known as system storage, measured on set calendar dates during the year. System storage is the sum of the water volume in each reservoir as determined by the Master Manual and is determined based on the elevation of each reservoir and known elevation-capacity relationships. This method of determining the water in a reservoir inherently includes both the stored water volume and the water flowing through the reservoir.

The upper two zones of the system - the annual flood control and multiple use zone and the exclusive flood control zone - are tied to flood control. The operational goal is to have both of these zones empty on March 1 of each year. This allows capacity to be available for the capture of the spring and summer runoff from the plains and mountain snow packs and rain events.

Filling a portion of the annual flood control and multiple use zone is a normal part of the annual operations. Water temporarily stored in this zone is metered out of the system throughout the year to supply water for the other project purposes. The process is repeated each year.

The exclusive flood control zone is available to capture excessive runoff once the annual flood control and multiple use zone is full. Water captured in this zone is evacuated when downstream conditions are capable of handling the increased releases. Under extreme conditions, the Mainstem System reservoirs are capable of surcharging storage above the elevation of their respective exclusive flood control zones. This occurred on two of the reservoirs during the 2011 flood event.

Authorized Purposes Requiring Water Releases but no Designated Capacity

Specific allocations of capacity have not been designated for the system's consumptive use authorized purposes. Instead, water is released through the Mainstem System reservoirs to meet the various project and system goals. Such goals include water level requirements in reservoirs and flow levels below each project. Water released for one purpose can also serve the other purposes. Water consumptively removed from the Mainstem System for a purpose is considered a depletion. The Master Manual is based on the actual storage volumes; thus, while water use may affect the operation of the system, it does not have any effect on the Master Manual.

Navigation Operations

Navigation on the Missouri River requires a certain flow level to be maintained in the navigation channel downstream from the reservoir reach. Navigation is limited to the normal ice-free season, with an eight-month full-length flow support season from April 1 until December 1. Flow support for navigation begins on April 1 at the confluence of the Missouri and Mississippi Rivers. This requires releases from Gavins Point reservoir to be increased about seven days earlier to account for travel time. A system storage check determines the total amount of combined storage held in the Mainstem System reservoirs on a particular date. The system storage check determines whether navigation support will be at full, intermediate, minimum, or no navigation service. A service level check determines the water depth to be provided in the navigation channel from Sioux City, Iowa, to St. Louis, Missouri, and is related to the draft of the barges navigating that channel. Navigation releases from the Mainstem System at Gavins Point are adjusted to meet the downstream target flow levels at four locations on the lower river - Sioux City, Omaha, Nebraska City, and Kansas City.

Navigation support levels are set for the first half of the navigation season during a March 15 system storage check. Navigation support level and season length for the second half of the season are

determined by a July 1 system storage check. Total system storage also determines the navigation season length of a full season with normal storage levels, reduced season due to low storage levels, or an extended season due to excess storage levels.

Hydropower

Hydropower is a non-consumptive use requiring the release of water through each of the six reservoir power houses. Fluctuations in electricity demand from consumers are handled by adjusting operations at individual reservoirs by temporarily storing more water in certain reservoirs during low demand and increasing water releases when the demand is high. There is no specific block of water allocated directly to hydropower use, so hydropower piggybacks onto and generates power by using water released for other project purposes, such as navigation.

Water Supply

Municipal and rural water systems and industrial supply throughout the reservoir and river reaches are consumptive water uses and are treated as depletions from the system. An estimated three million people are served by municipal water supplies from the Missouri River, and it is the major water supply source for the cities of Bismarck, Omaha, Kansas City, St. Louis, and several smaller rural and Native American communities. Rural water systems withdraw water from the river, transport it to treatment facilities, and then send the treated water to water systems for distribution to communities and individuals located away from the river.

Irrigation

The 1944 Flood Control Act envisioned nearly 5.3 million acres of irrigation development from the Mainstem System, including four million acres in the upper basin states. Authorized irrigation development for the States also included water supply to communities along the irrigation conveyance systems. Only a small fraction of this irrigation was ever developed. The majority of the irrigation has been privately developed and uses small private intakes scattered throughout the reservoir and river reaches.

Although not specifically identified as releases from the reservoir, water supply and irrigation use upstream from Gavins Point are treated as depletions from the system by the Corps. In the reach below Gavins Point, water for these uses is included in the water released for navigation use. Flows diminished by pumping for these uses are accounted and compensated for using the same target locations described in the navigation section.

Water Quality

Several coal-fired and nuclear power plants currently draw cooling water from the river. The river's flow and water temperature affect the power plants' abilities to discharge heated water back into the river while staying within state limits in their National Pollutant Discharge Elimination System permits. Generally, system project release levels necessary to meet the downstream navigation and water supply needs exceed the minimum release levels necessary to meet minimum downstream water quality requirements. This usually allows water used for industrial thermal power generation cooling to be returned to the river.

Recreation

Recreation, a non-consumptive use, occurs in both the reservoir and river reaches of the system. Although recreation use occurs at all reservoir elevations, recreation during extreme high and low water levels can be adversely affected by access issues. Public access points, such as boat ramps, parks, and fishing areas, can be under water and unusable during periods of high water levels. Boat ramps can also become unusable during periods of extremely low water levels when the water recedes and the ramps are left high and dry.

Fish and Wildlife (including threatened and endangered species)

The reservoir and river reaches support a large variety of fish and wildlife species. In the reservoir reaches, fluctuating water levels can negatively affect the propagation and survival of certain species. In the river reaches between reservoirs and downstream of Gavins Point, a number of species of fish and wildlife are able to survive and flourish. However, some species of fish and wildlife can be adversely affected by widely fluctuating release levels due to changing the available habitat, spawning, and nesting zones.

Since the reservoir system was completed 50 years ago, a large section of the Missouri River changed from a free flowing meandering river to one with large impoundments and channelized, non-meandering river reaches. Some native fish and bird species have been adversely impacted by these changes to the point they have been listed as threatened or endangered species. The Master Manual contains operational criteria to address the recovery of these species.

The Effects of Recognizing States' Rights to Natural Flows on Master Manual Operations

The construction of the Missouri River Mainstem System between 1939 and 1964, altered the river's natural hydrograph. The river's flow has been manipulated in a process where the base flow passes through the reservoirs, while the excess flow is captured in the reservoirs. This base flow is

available to meet the water needs of the States' populations, including Native Americans, in both the reservoir and river reaches. If there is not sufficient base flow available to meet those needs, the Corps has the ability to augment this flow by releasing water from storage.

The States view this base flow as a natural flow, to which they and the tribes have the unimpeded right to allocate for use under water appropriation systems. If this natural flow water is not being used, it continues to be available to meet the authorized purposes, some of which hold state issued water rights. Recognizing natural flow separate from storage, as well as state and tribal water rights for allocating water, does not run contrary nor interfere with the Corps meeting the authorized purposes of the Mainstem System nor the operation of the Mainstem System through the Master Manual.

Prior Appropriation System and Water Supply Agreements

In the western United States, where water can be limited and is often scarce, the risk to water-using enterprises and the need for investment in water-use infrastructure has required an orderly regulatory system within which water rights can be assured and the risk associated with those established rights can be clearly evaluated and minimized. For this reason, water use in western states is governed under the doctrine of prior appropriation. Under prior appropriation, "[w]ater belongs to the state, but users can acquire the right to use water" and "[t]he first user of water has priority (superior legal right) to continue using the water over subsequent users of the water."⁴¹ The principle of prior appropriation is often summarized as "first in time, first in right."

While the general system of prior appropriation is similar throughout the west, each state and tribe implements its laws with various nuances.

All water users who want to put water to beneficial use must get a permit. The water rights are established and protected in the order of priority. The order of priority is established by the date which the completed application for a water permit is received by the state's water appropriation agency. After a water right is established, the right of use belongs to the permit holder as long as the user complies with the permit conditions. Each permit specifies a maximum flow rate (cfs), maximum volume (acre-feet), and various other conditions (such as metering and reporting requirements).

⁴¹ Dr. David Saxowsky, Law Professor, University of North Dakota Law School and North Dakota State University Department of Agricultural Economics. Web Access Sept. 19, 2014. <http://www.ndsu.edu/pubweb/~saxowsky/aglawtextbk/chapters/waterlaw/PriorAppro1.html>

In times of scarcity, beneficial use of the most junior permit holder is curtailed by the state to guarantee satisfaction of the beneficial use of all senior water rights within the available supply of water. Water permit use is curtailed in the reverse order of priority until all remaining senior water rights can be satisfied. When water supplies become more abundant (flows increase), rights of diversion and beneficial use are restored in the order of seniority of the curtailed users. In this manner, an orderly process of use and risk assessment is known before investment in a water-using enterprise.

Under the appropriative system, storing water in a reservoir is considered a beneficial use. Water permits for storage are obtained in the same manner as for other uses. The permit is assigned a priority date and allows the permit holder the right for one annual fill of the reservoir. If another downstream appropriative water user on the same watercourse has a senior permit to the reservoir storage permit, the junior priority reservoir permit holder cannot store water until the senior permit holder's right is satisfied.

Indian reserved water rights are often referred to as "Winters rights." A 1908 Supreme Court case, *Winters v. U.S.*, held that the United States, when creating a reservation, implicitly reserved water for tribal use on the reservation.⁴² Even if the legal regimes of different tribes varies, the Winters right is a prior appropriation right when viewed in conjunction with the states' water rights. Although the process of quantifying Indian reserved water rights is complex, as a general rule, the priority of an Indian reserved water right is the date the reservation was established.⁴³ Thus, the majority of Winters rights pre-date statehood and thus pre-date the majority of state appropriations. Additionally, if tribes believe they are not getting enough water under their Winters rights or they want water in addition to their Winters rights, this is an issue for the states to work out between themselves and tribes and does not involve the Corps. Similarly, if a state believes another state is using too much water from the system, this is an issue for the states to resolve via compact or litigation. Neither of these situations impact the Corps' reservoir operations, which is the only authority the Corps should be exercising over the system.

The following hypothetical examples illustrate the manner in which adjustments of water use are made in the States under the prior appropriation doctrine. These examples will also demonstrate the appropriate use of water supply agreements within the prior appropriation states. Figure 4 visually explains the hypothetical system of permits. Several water-using enterprises are shown sequentially along a river reach below a gaging station. Each water use enterprise has a corresponding priority date

⁴² *Winters v. U. S.*, 207 U.S. 564 (1908).

⁴³ Conf. of W. Att'ys Gen., *American Indian Law Deskbook*, 8.8 (p. 571) (2014 ed.).

and permitted diversion rate. The order of priority is also listed on the figure. Additionally, the descriptive information for the hypotheticals is contained in Table 1.

Table 1: Descriptive data for water use cases discussed in the examples and shown on Figure 4.

Location	Permit Holder	Priority Date	Priority	Diversion (cfs)	Summer Use Order	Total Ordered Diversion (cfs)	Spring Use Order	Total Ordered Diversion (cfs)
4	Tribe	1867	1	10	1	10	1	10
2	Municipality	1920	2	1	2	11	2	11
7	Municipality	1930	3	1	3	12	3	12
5A	Municipality	1945	4**	1	4	13	4	13
6	Irrigation	1954	5	2	5	15		-
5	Reservoir	1955	6		6	One-fill	6	One-fill
3	Irrigation	1980	7	2	7	17		-
8	Irrigation/ U.S.B.R. Contract	1965	6a*	40	6	57		-
5B	Industrial/ U.S.B.R. Contract	2014	8[6b]*	1	6	58	6	14

* Under Reclamation water supply agreement.

** Point of diversion on reservoir, but established on the river before reservoir construction.

The U.S. Bureau of Reclamation dam and reservoir (Priority 5, Location 5) are governed by the one-time fill rule, in which the reservoir can be filled completely once a year at snowmelt. For simplicity, all case examples assume full diversion and use of appropriated water with no return flows. Unless otherwise specified, they also assume that the Tribe will fully use its indicated water right.

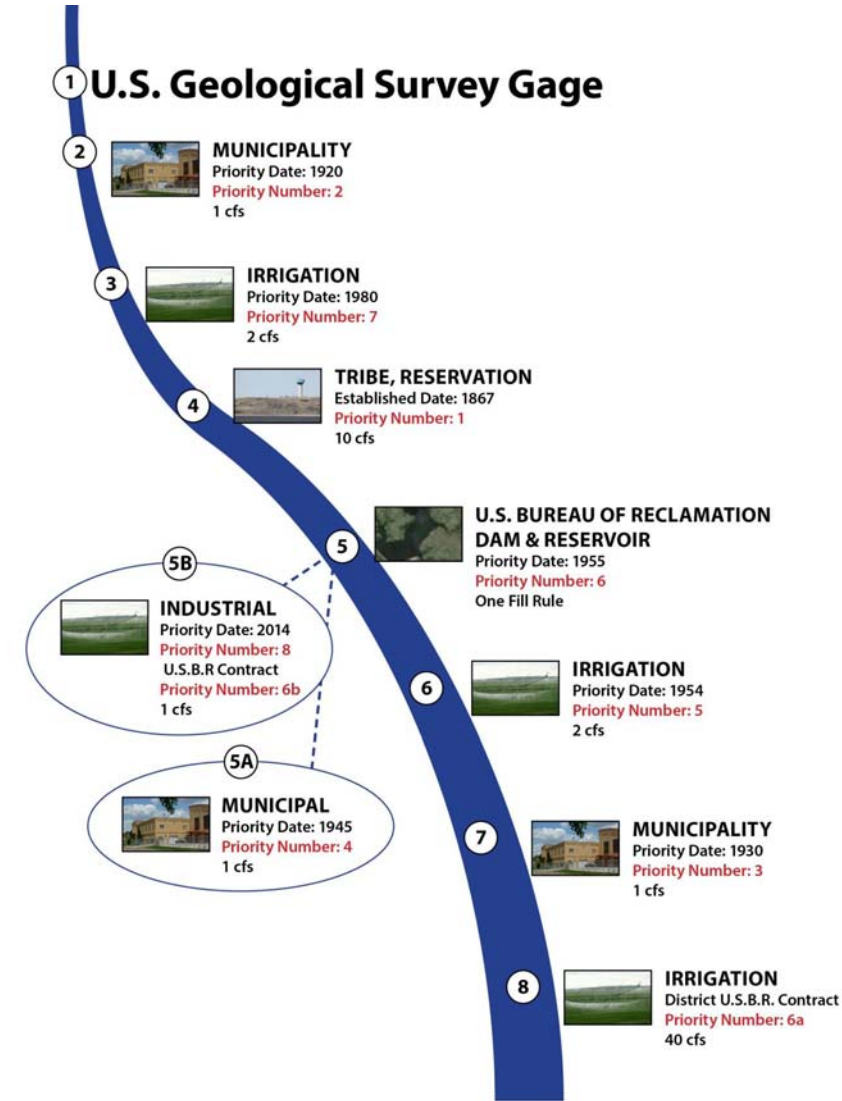


Figure 4: Hypothetical Water Appropriation Permit Scenario
Source: North Dakota State Water Commission

Example 1: 22 cfs at the U.S.G.S. gage during the summer irrigation season.

Result: With the exception of the irrigation district at Location 8 (priority 6a) and the industrial user at Location 5B (priority 8), only 17 cfs is necessary to supply all users. The irrigation district at location 8 and the industrial user at Location 5B have water contracts from the Reclamation reservoir, which was filled in the spring and passes all inflows through as outflows. Thus, all water rights can be fully used.

The irrigation district at Location 8 and the industrial user at Location 5B have chosen to obtain water through a water storage agreement with Reclamation. If Reclamation has been able to fill its reservoir, water use by the irrigation district and industrial user should not be impacted. Comparing this to Corps operations, a water user could choose to enter a water supply agreement with the Corps for stored water to mitigate the risk that water supply will not otherwise be available from natural flows.

Example 2: 15 cfs at the U.S.G.S. gage during the summer irrigation season.

Result: The irrigator at Location 8 (priority 6a) and the industrial water user at Location 5B received their full appropriation because they are supplied by releases from storage from the Reclamation reservoir, which was filled in spring. The remaining users need a total of 17 cfs, which means there is a two cfs deficit. The irrigator at Location 3, being most junior, may not divert water. The tribe, the three municipalities, and the irrigation user at Location 6 (priority 5) will divert their water rights from the full 15 cfs natural flows.

Similar to Example 1, the irrigation district at Location 8 received water under a water supply agreement with Reclamation, which provided water out of storage in the reservoir from the spring fill. Similarly, the industrial user at Location 5B wanted to mitigate the risk associated with being the most junior user and entered a water supply agreement to receive water out of storage from the spring fill each year.

Example 3: 10 cfs at the U.S.G.S. gage during the summer irrigation season.

Result: The Tribe diverts all of its 10 cfs water allocation. The irrigation district at Location 8 (priority 6a) is supplied by releases from storage in the Reclamation reservoir, which was filled in spring. Because the industrial user at Location 5B (priority 8, beneficial use date 2014) has entered a water supply agreement with Reclamation, the industrial water user would have the ability to use water stored in the reservoir (as Priority 6b) from the spring fill. All users on or upstream of the reservoir, except the Tribe, will have to defer diversion and pass water downstream. All non-contract users downstream of

the reservoir will have no water to divert because of upstream diversions by the Tribe. If the Tribe defers some use and passes water downstream, the first right for any water not used by the Tribe would belong to the municipality at Location 2 (priority 2). The next would be the municipality at Location 7 (priority 3), followed by the municipality at Location 5A (priority 4), and then the irrigator at Location 6 (priority 5).

Example 4: 15 cfs at the U.S.G.S. gage during spring following a dry winter.

Result: There is no irrigation demand in the spring. With no irrigation, only the Tribe, the three municipalities, and the industrial user (Location 5B, priority 8) are diverting water. Assuming full diversion by the Tribe and municipalities, 13 cfs of diversions are senior to the Reclamation one-fill permit and have precedence, leaving only two cfs for filling the reservoir until natural flows increase. The industrial user at Location 5B may not divert water unless that person obtains a water supply agreement with Reclamation. Reclamation, with an earlier priority date than the industrial user, may decide whether to supply the Industrial user and fill at a one cfs rate or use the full remaining two cfs to fill the reservoir. Reclamation (Location 5, priority 6) must pass at least one cfs of natural flow downstream for the municipality at Location 7 (priority 3). Reclamation must also allow diversion of one cfs from natural flows within the reservoir for the municipality at Location 5A. Although diverting from a location on the reservoir, the municipality at Location 5A has a water right from the river at the point of diversion now covered by the reservoir, which predates the water right of the Reclamation reservoir.

The States and the Corps' reservoir management are analogous to the municipality and the Bureau reservoir described in the example. Like the example municipality, the States had water rights prior to reservoir construction. Both the language and history of the 1944 Flood Control Act and the Rivers and Harbors Act of 1945 attest to federal protection of states' rights to use the natural flow of the Missouri River. The States' use would have priority over the discretionary management of Corps reservoir stored water.

Example 5: 12 cfs at the U.S.G.S. gage during spring following a dry winter.

Result: There is no irrigation demand in the spring. With no irrigation, only the Tribe (Location 4, priority 1) and two of the municipalities (Location 2, priority 2; Location 7, priority 3) are diverting water. Full diversion by the Tribe and all three municipalities (Locations 2, 5A, and 7) would require a diversion of 13 cfs from the river. Thus, there is a water supply deficit of one cfs. Reclamation may not divert any water to satisfy its one-fill right until flows increase. Reclamation must pass all natural flows downstream. If Reclamation considers its existing storage sufficient to supply annual needs, it may

choose to supply the most junior municipality (Location 5A, priority 4) and the industrial user (Location 5B, priority 7) from its storage under water supply agreements. Another possibility would be for the municipal and industrial users at Locations 5A and 5B to enter into water supply agreements with the Tribe. This possibility would depend on the terms of the State-Tribal compact quantifying the tribal water rights.

These examples are obviously simplified and will have variations in different states. However, in accordance with the examples, as long as the flow remains at least 17 cfs, there is enough water in the system to supply all users without the benefit of storage. Those having a Reclamation water supply agreement are supplied from storage. If the flow drops below 17 cfs, non-storage water users would have the option of either being curtailed from use until flows increase or purchasing water from storage through a water supply agreement with Reclamation.

Comparing to the Corps operations, as long as the flows in the Missouri River remain higher than the overall use, water users are not benefiting from the storage in the reservoirs and should not be forced into water supply agreements with the Corps simply by virtue of access being within the reservoir boundary. Also, because the tribal reserved water rights will in nearly all cases be superior to any state user rights, it is unlikely that tribes would ever need to use water from storage. However, several of the tribes have no free-flowing river access because their reservations were flooded by the reservoirs. But the Corps' current policy interpretation forces the tribes into water supply agreements. From this perspective, the tribes and states are similarly situated.

Conclusion

The Corps' new policy interpretation that all water behind a reservoir is subject to its control is contrary to law and to the way the system has been operated for over sixty years. The States recognize the Corps' authority to operate the Missouri River System to meet the project purposes. The Corps needs to recognize the States' authority in carrying out their statutory authority and responsibility to appropriate the natural flows of the Missouri River within the reservoir system. Similarly, the tribes also have authority to regulate their Winters appropriations without interference by the Corps. Both the States and the tribes can permit water from the natural flow when water is available. Any conflicts between the States and the tribes or between the States and other states need to be work out either via compact or litigation amongst each other. Such disputes are not within the purview of the Corps' authority. The Corps has authority to operate the reservoir system in conjunction with the Master

Manual. The recognition of natural flows as separate from storage does not impact the Corps' authorities and is the only way for the system to operate within the confines of the law.

American Bar Association
Section of Environment, Energy, and Resources

Surplus Water and the Missouri River Moratorium

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ABSTRACT

Since 2010, the Army Corps of Engineers has denied access easements to the portions of the Missouri River flowing under Corps reservoirs. The moratorium is based on an internal real estate policy fabricated on authority in Section 6 of the Flood Control Act of 1944 to sell surplus water. This paper briefly discusses the origin of North Dakota's constitutional water right, the riparian and prior appropriation legal doctrines, provisions of the Flood Control Act of 1944, and the definitions of stored and surplus water. Some of the unique characteristics of the Missouri River Basin are presented. A proposed policy solution is presented using an example of the Bureau of Reclamation's Heart Butte Dam in Grant County, North Dakota.

Introduction

Imagine for a moment that you're sitting in your living room, minding your own business, when suddenly, there's a knock at the door. Upon opening the door and exchanging introductions with a well-dressed stranger, you are informed that the two-lane street in front of your home is going to be expanded to four lanes to better serve businesses downtown. As a result, you and your home need to go. Your family is offered compensation to be uprooted, and you rebuild your home further back on your lot and out of the way of the new street. One might expect that this is the end of the ordeal. But, it's not - not even close.

Fast-forward several years. There's another knock at the door. It's the same well-dressed stranger from years before. This time, the stranger informs you that if you would like to continue using the street in front of your home, you will need to give back the money you were originally compensated and also pay additional fees. You try to make the case that you were getting along just fine before they widened the street, but the stranger persists that you're going to have to pay up. You see that the stranger constructed a barricade at the end of your driveway and

refuses to allow you to access the street unless you pay. Oh, and by the way, the downtown businesses that have benefitted from the street expansion - they won't be paying a dime.¹

Background

In May 2010 – in a stunning challenge to states' rights – the U.S. Army Corps of Engineers began denying access to river water flowing through the six “mainstem reservoirs” along the Missouri River.² Based on a 2008 Real Estate Policy (Guidance Letter No. 26), the Corps refuses to process any access easement applications across its reservoir take-lines without an applicant first signing a water supply agreement in which the applicant would agree to pay the Corps for the use of the water.³ This policy is being incorrectly applied based on perceived authority found in the Flood Control Act of 1944 that “the Secretary ... is authorized to make contracts ... at such prices and on such terms as he may deem reasonable, for domestic and industrial uses for **surplus** water that may be available at any reservoir.”⁴ Instead of applying this policy only to surplus water from storage, the Corps is attempting to apply this policy to all water flowing through the reservoirs. Not only does the Corps refuse to recognize states' rights to water management, the “one-size-fits-all” policy fails to recognize the unique nature of the Missouri River watershed.

State Rights

Each state has its own way of addressing water use and control. In the Enabling Act, Congress provided for the people of the Dakota Territory to form constitutions and state governments and be admitted into the union on an equal footing with the original states.⁵ In North Dakota, the constitution provides that “[a]ll flowing streams and natural watercourses shall forever remain the property of the state for mining, irrigating and manufacturing purposes.”⁶ This constitutional language was adopted through the Enabling Act by proclamation of the President when North Dakota was declared a state in 1889.⁷

As time has progressed since statehood, federal agencies have continued to recognize the state's primacy with regard to water rights. This is evidenced by the fact that the Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Department of Agriculture, Fish and Wildlife Service, Forest Service, and Park Service currently hold a combined total of 195 conditional or perfected water permits in North Dakota.⁸

¹ Adapted from Patrick Fridgen, *Missouri River Storage Fees: Unjust and Unacceptable*, North Dakota Water, March 2011, at 16.

(<http://www.swc.state.nd.us/4dlink9/4dcgi/GetContentPDF/PB-1932/OxbowMar2011.pdf>)

² The six mainstem reservoirs are Fort Peck (MT), Garrison (ND), Oahe (ND/SD), Big Bend (SD), Fort Randall (SD), and Gavins Point (SD/NE).

³ <http://mo-rast.org/wp-content/uploads/2011/03/RealEstatePolicy26.pdf>

⁴ Flood Control Act of 1944, § 6, 58 Stat. 887, 890 (emphasis added).

⁵ Enabling Act of 1889, 25 Stat. 676, ch. 180.

⁶ N.D. Const. art. XI, § 3.

⁷ See Enabling Act of 1889, 25 Stat. 676, ch. 180, § 8.

⁸ See North Dakota State Engineer permit database.

<http://www.swc.state.nd.us/4dlink7/4dcgi/permitsearchform/Permits>

Review of Riparian and Prior Appropriation Water Law Doctrines

There are two prevailing doctrines governing water rights – the riparian doctrine and the prior appropriation doctrine.⁹ The majority of the United States uses the riparian system of water appropriation.¹⁰ Riparian rights originate from land ownership.¹¹ Owners of land contiguous to a watercourse or overlaying an aquifer are entitled to whatever quantity of water is necessary for reasonable use with respect to the needs of other appropriators.¹² These rights vary, however, depending on the quantity of water available at any given time.¹³ Riparian rights remain vested even while unused.¹⁴

In contrast, the prior appropriation doctrine is used in the western United States and does not depend on land ownership.¹⁵ Water rights are acquired and maintained through actual beneficial use.¹⁶ Prior appropriation rights are of a fixed quantity and are governed by a rule of priority – “first in time, first in right.”¹⁷ The older right is the senior and the younger right is the junior.¹⁸ Within the state, in times of shortage, a senior can curtail the rights of all upstream juniors in order to gather their rightful water quantity.¹⁹

During times of shortage or perceived threats of shortage, the practical differences in how these doctrines manifest results become profound in that riparians are curtailed proportionately, whereas prior appropriators operate under a permit regime where those last permitted for beneficial use are the first shut off from water supply. When there is enough water, the differences in these regimes may seem more theoretical to the end water user, but the differences still remain significant in the legal realm and dramatically impact states’ regulatory management systems.

Flood Control Act of 1944

The 1944 Flood Control Act, established policies relating to flood control and authorized the construction of thousands of dams and levees across the country.²⁰ The Act established a Missouri River Basin program to manage the Missouri River and its dams with eight authorized purposes: hydropower, recreation, water supply, navigation, flood control, fish and wildlife, irrigation, and water quality.²¹ Section 6 of the Act allows the Corps to sell surplus water.²² More importantly is that the very first lines of the Act state:

⁹ See generally *Colorado v. New Mexico*, 459 U.S. 176, 179 n.4 (1982); David C. Getches, *Water Law in a Nutshell* 3-7 (3d ed. 1997).

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ Pub. L. No. 534, 58 Stat. 887, 33 U.S.C. § 708.

²¹ *Id.*, § 9.

²² *Id.*, § 6.

[I]t is hereby declared to be the policy of the Congress to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control, as herein authorized to preserve and protect to the fullest possible extent established and potential uses, for all purposes, of the waters of the Nation's rivers...²³

The Act further recognizes the difference between the east and west by specifically protecting beneficial uses of water in states west of the ninety-eighth meridian.²⁴ The Corps' implementation of its real estate policy seems only able to acknowledge Section 6 of the Act and completely ignores Section 1's recognition of states' rights to manage water within their borders and the differences in water policies between western and eastern states.

What is Surplus Water?

Because there is no dispute that Section 6 of the 1944 Flood Control Act allows the Corps to sell surplus water, the crux of this dispute hinges on what is meant by surplus water. Although the meaning of surplus water was a hotly contested topic during the congressional hearings on the bill, no official definition of surplus water was ever established by Congress.²⁵

Surplus water is defined by the Corps in two ways: 1) "Water stored in a Department of Army reservoir that is not required because the authorized need for the water never developed or the need was reduced by changes that have occurred since authorization or construction" or 2) "Water that would be more beneficially used as municipal and industrial water than for the authorized purpose that, when withdrawn, would not significantly affect authorized purposes over some specified period."²⁶

The Corps has indicated in meetings and through its behavior that once water reaches the Corps' reservoirs, ALL water within the boundaries of that reservoir is subject to the Corps' authority and can be evaluated to determine whether it is "surplus" under the definitions above. Stated another way, the Corps' view is that the Missouri River is comprised of a series of reservoirs connected by free-flowing rivers. The states' rights view is that there are reservoirs sitting on top of portions of the Missouri River and the reservoir pool could be evaluated to determine whether there is surplus water, but the natural-flowing river volumes that flow beneath the reservoir system belong to the respective states.

Further, the Corps' view fails to recognize in prior appropriation states, the riparian location of an owner is not coupled with any usage rights. While the Corps certainly has congressional authorization to operate its dams for the authorized purposes, it does not mean the Corps has congressional authority to sell water for which it has no usage rights.

²³ *Id.*, § 1.

²⁴ *Id.*, § 1(b).

²⁵ See Murray G. Sagsveen, *Water Marketing Authority of the Corps of Engineers From Lake Sakakawea Under Section 6 of the Flood Control Act of 1944* (1978). Available from the North Dakota State Water Commission.

²⁶ U.S. Army Corps of Engineers, *Water Supply Handbook 2-7(-8)* (Dec. 1998).

Unique Characteristics of Missouri River Basin

Another main problem with the Corps' policy is that it is attempting to use a one-size-fits-all approach for the entire country. While consistency in policy application is necessary, policies must be flexible enough to recognize and accommodate unique circumstances.

There are three main characteristics that make the Missouri River Basin unique in comparison to other major watersheds across the country: the mix of riparian and prior appropriation doctrines amongst the basin states, the size of the reservoirs, and the purpose for which the dams were built.

Mix of Riparian and Prior Appropriation Doctrines

The Missouri River Basin is comprised of ten states, and the river itself flows through or borders seven of those states.²⁷ Of those seven states, Montana, North Dakota, South Dakota, Nebraska, and Kansas all regulate water under the prior appropriation system.²⁸ Iowa and Missouri regulate water under the riparian system.²⁹ Because the Missouri River is roughly the dividing line between the riparian states and the prior appropriation states, no other major watershed in the country encompasses two different appropriative legal regimes that must be respected. In conjunction with those two legal regimes are two general classes of use. In riparian states, as discussed above, reasonable use of the water belongs to the riparian owners. This means the Corps, as the riparian owner, would have a user interest in the water captured by its reservoirs. The prior appropriation states, in contrast, do not vest user rights based on land ownership. Therefore, the Corps would have no user interest in the river flowing through the reservoir in prior appropriation states unless it has been granted those rights by the state.

Size of Reservoirs

Additionally, the three upstream reservoirs (Fort Peck, Garrison, Oahe) along the Missouri River are the three largest Corps dams in the country. See Figure 1. Fort Peck is 18.7 million acre-feet, Garrison is 23.8 million acre-feet, and Oahe is 23.1 million acre-feet.³⁰ For comparison, the next largest Corps dam is Sam Rayburn Dam in Texas, with a volume of 6.3 million acre-feet.³¹

²⁷ Wyoming, Colorado, and Minnesota are located in the Missouri River Basin, but the river itself does not flow through those states.

²⁸ <http://www.ncsl.org/issues-research/env-res/state-water-withdrawal-regulations.aspx#>

²⁹ *Id.*

³⁰ Missouri River Mainstem Reservoir System Master Water Control Manual (Master Manual), Revised March 2006, Plate II-1.

³¹ National Inventory of Dams - <http://geo.usace.army.mil/pgis/f?p=397:1:0>

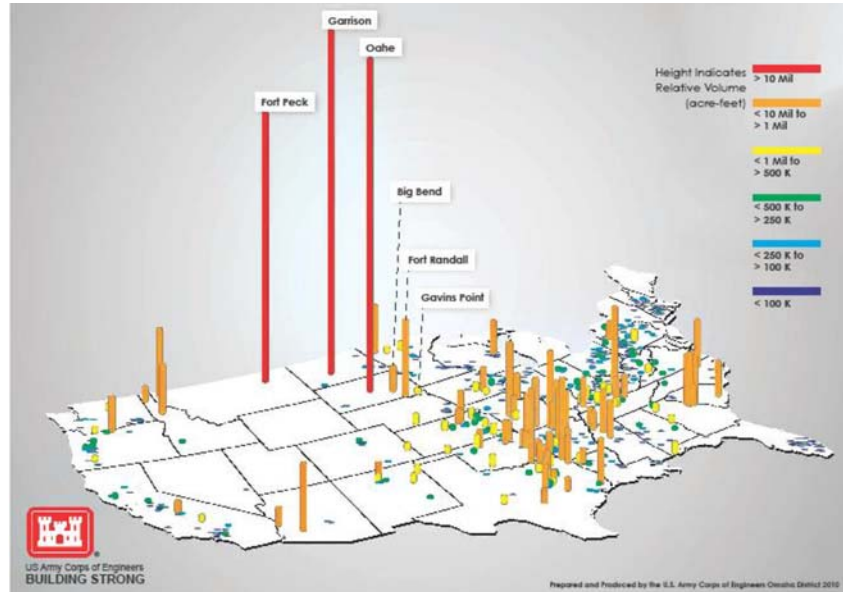


Figure 1: Relative Storage Capacity of Corps' Reservoirs
Source: North Dakota State Water Commission, adapted from Corps' graphic

More importantly, because of the size of the reservoirs and the Corps' policy implementation, river access in both North Dakota and South Dakota has been severely restricted. As seen in Figure 2, approximately 75% of the river through North Dakota and South Dakota can no longer be accessed due to the Corps' policy.³² Also of critical importance and illustrated by Figure 2 is the fact that the Fort Berthold, Standing Rock, Cheyenne River, Lower Brule, Crow Creek, and Santee Sioux tribal reservations have had their access completely restricted by this Corps' policy. The Yankton reservation has also had its access restricted in approximately the northern half of the reservation.

Purpose for which Dams were Built

In most of the country, the Corps has constructed dams to help with additional water supply needs. While water supply is one of the authorized purposes, the natural flow of the Missouri river provided abundant water supply prior to dam construction. Instead, the Missouri River dams were built mostly to the detriment of the upstream states. As time has passed, the benefits of the system have mostly accrued downstream. In fact, while the upstream states have benefited from the dams in the form of flood control, hydropower, and recreational activities, this has come at great sacrifice. Not only were thousands of people displaced, particularly the tribes, but the highly fluctuating nature of the reservoirs causes difficulty with locating water supply intakes and recreation facilities.

³² Although not shown directly in the graphic, the number of blocked river miles in North Dakota is 262/354 (74%) and the number of blocked river miles in South Dakota is 375/483 (78%).

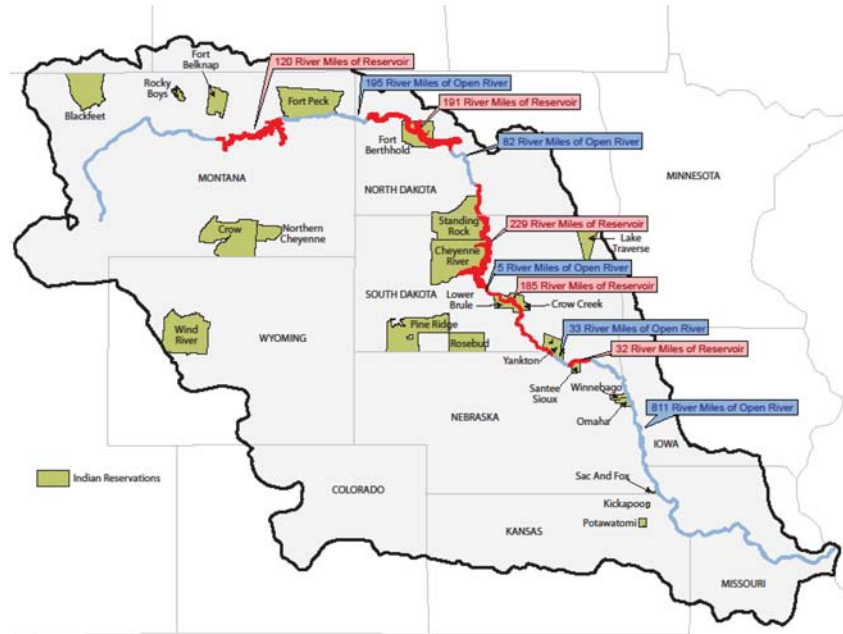


Figure 2: Missouri River Basin Illustrating Tribal Reservations, Reservoir Miles, and Open River
Source: Compiled by North Dakota State Water Commission

Heart Butte Dam Example

On a smaller scale, but similar to Garrison Dam, the Heart Butte Dam was authorized under the Flood Control Act of 1944.³³ Completed in 1949, the primary purposes of the dam are flood control and irrigation, though the Lake Tschida reservoir provides significant recreational and fish and wildlife opportunities.³⁴ The reservoir has a total capacity of 214,169 acre-feet.³⁵ The Bureau of Reclamation holds Conditional Water Permit 250B authorized by the State Engineer, with a priority date of March 13, 1946, which authorizes the Bureau to put 75,785 acre-feet to beneficial use.³⁶ The Bureau holds service contracts with the Western Heart River Irrigation District and private irrigators in the Lower Heart Irrigation Company.³⁷ Through these service contracts, the Bureau provides water to the irrigators when the irrigators make a call. The

³³ U.S. Department of Interior, Bureau of Reclamation, *Heart Butte Reservoir Resource Management Plan*, p. 6 (Dec. 2006). http://www.usbr.gov/gp/dkao/hb_rmp_draft07.pdf

³⁴ *Id.* at 6-7.

³⁵ 147,027 acre-feet for flood control, 67,142 acre-feet for active conservation, and 5,227 acre-feet for dead storage. *Id.* at 8.

³⁶ Permit on file with the North Dakota Office of the State Engineer.

<http://www.swc.state.nd.us/4dlink7/4dcgi/permitsearchform/Permits>

³⁷ U.S. Department of Interior, Bureau of Reclamation, *Heart Butte Reservoir Resource Management Plan*, p. 10 (Dec. 2006). http://www.usbr.gov/gp/dkao/hb_rmp_draft07.pdf

irrigators are not required to have a separate appropriation permit from the State Engineer for this water because the appropriation is coming through the Bureau.

Additionally, flood water storage does not require an appropriation permit. However, each spring during the first runoff after February 1, the State Engineer allows a “one-time fill” for reservoirs up to the amount authorized in the permit and the consumptive use must be taken from this stored water.³⁸ With the exception of flood waters, all inflow to the reservoir after the spring fill must be allowed to pass through the reservoir and downstream.³⁹

Proposed Policy Solution

The Corps has indicated it wants a uniform policy throughout the country to deal with surplus water contracts. Any uniform policy must also be flexible enough to accommodate for various state laws, diverse physical conditions, and disparate water appropriation doctrines. In order to implement such a uniform policy, the Corp must first fully understand and follow its specific congressional authorizations. Most project authorizations and their supporting documentation recognize the unique elements of each basin.

Second, the Corps must recognize states’ interests and rights to water use and control, both individually and in conjunction with other states. This includes different state laws regarding capture of water supply and beneficial use. Such laws vary even amongst the prior appropriation states (and similarly amongst the riparian states). The Corps must also recognize various tribal rights, many of which have not yet been quantified. The Corps must protect the states’ right to access and control any water supply that would be available without the presence of dams and reservoirs. This will vary from state to state and region to region. In many parts of the country, this may be a negligible amount, particularly in the summer months. In other parts of the country, regional and multi-state water compacts must be respected. In the upper Missouri River basin states, the natural flows through the river are more than adequate to meet the needs of the people living in those regions.

Finally – and most importantly – the Corps must properly define stored water. The storage capacity of a reservoir is an engineering concept that seems to be misinterpreted by the Corps as the quantity of stored water. This misunderstanding must be extinguished in any future uniform water policy. In prior appropriation states where water supply is scarce and diversion of water supply to points of use is required, there is no misunderstanding of this concept. As discussed above, to place water into storage in North Dakota requires a permit. In many prior appropriation states, stored water is the capture of high flows that are not able to be immediately put toward beneficial use, and the storage of this water supply will be released at a later time to augment lower flows. But this stored water is not all the water within the reservoir. Instead, the stored water is the difference between water flowing into the reservoir system and the water flowing out of the reservoir system. If more water is coming into the reservoir than is leaving the reservoir, this supply is captured as stored water. If less water is coming into the reservoir than is leaving the reservoir, this water supply is the release of stored water.

Once the Corps has consistently and correctly applied the above concepts, then the Corps can develop storage contracts that comply with congressional authorization to sell “surplus water”

³⁸ N.D.A.C. § 89-03-01-01.4. The one-time fill rule was a long-standing state policy prior to codification in 1989.

³⁹ *Id.*

out of the Corps' allocated stored water supply and follow the direction provided in Section 1 of the 1944 Flood Control Act to recognize states' rights to manage water within their borders.

Conclusion

In the 1940s, that well-dressed stranger mentioned at the beginning of this paper knocked on the doors of many North Dakota homes, farmsteads, and businesses along the shores of the Missouri River. Compensation and promises of prosperity and always-available water supplies were offered as bargaining chips to those in the footprint of reservoirs – those who neither asked for, wanted, nor even needed those reservoirs for a reliable water supply. And now years later, when those same North Dakotans are interested in using a tiny fraction of the Missouri River's vast water resources, to which they have a legal right to put to beneficial use, the well-dressed stranger is now blocking access to that supply and requiring a fee before access can be granted. Meanwhile, those living downstream along the undammed portions of the river have not only been the beneficiaries of flood control, but are still allowed their rightful access to water supplies without Corps interference.

Senator KELLY. Thank you, Ms. Verleger.

I am going to recognize myself for 5 minutes. Then we will go to Senator Cramer. With the four of us here, if it remains that, I think we will get a couple opportunities.

I want to start with Governor Lewis. Thank you for your opening statement. That is exactly what I want to talk about, which is aligning of these canals. Some of the stuff you went through pretty quickly so I want to kind of drill down. First, let me say thank you for everything the Gila River Indian Community is doing in trying to mitigate for this horrific drought we have been experiencing for 20 years. It really is going to take all of us. The Community stepping up the way you have is much appreciated by the State of Arizona, myself, and my office.

The advantage we get from this is we are going to save some water and also generate some electricity. You went through some of this already but I want to make sure we get this correct for the record. My understanding is initially it is going to be 1,000 feet, lineal feet, of solar panels covering these canals. For that 1,000 feet, what is the anticipated water savings per year in acre-feet?

Governor Lewis. Thank you, Chairman. The Community expects that the project will conserve water, of course, that is lost to evaporation and thermo-electric energy usage. It is expected to conserve roughly 8 acre-feet of water annually. That is combined to 5.4 from evaporation and 2.58 acre-feet from thermo-electric energy usage.

Senator KELLY. How many total megawatts would that lining of the 1,000 lineal feet of canal generate?

Governor Lewis. It would equate to 1,000 feet would produce 1 megawatt of energy.

Senator KELLY. One megawatt of energy. What is the total cost of the project? What is the Federal versus non-Federal? Can you go into a bit more detail, I think in your opening statement you said if the Army Corps was to do this on their own, it would take longer and cost more? Could you give us an estimate of how much more it would cost?

Governor Lewis. The traditional cost share percentage is a 65 percent to 35 percent breakdown. That is for agricultural water supply. In accordance with 33 USC, Subsection 22.13(c), this would include credits for LERRDs, which stands for lands, easements, rights-of-way, relocations and disposal.

However, associated implementation guidance modifies the cost sharing agreement for tribes by applying a waiver of \$665,000 to the non-Federal share. This will reduce the Community's cost share to 25 percent of the regular 35 percent share. This reduction results in an estimated non-Federal cost share of roughly 6 percent of the estimated total project cost of \$423,850. The adjusted Federal costs are around \$6,320,000.

Senator KELLY. What are the opportunities? How many miles of canals did you say there were?

Governor Lewis. That is suitable for this project, 150 miles.

Senator KELLY. One hundred and fifty miles. Six thousand feet or so in a mile, so you could expand this by well over a couple orders of magnitude, potentially. Obviously, the cost would be in proportion. My point is I think there is an opportunity to save significant amounts of water and generate significant electricity.

Governor Lewis. Yes, Chairman. This is a goal that as a tribal leader I set for our Community to be one of the first net-zero communities especially in Arizona to potentially be a significant energy producer as well through this project. We might be in competition with my good friend to the right of me from the Salt River Project.

Senator KELLY. You said there was a recommendation of a change to statutory language. I am going to go over here by about 30 seconds. Could you go over that again and be a bit more specific?

Governor Lewis. We are realizing that the Corps lacks, Chairman, that essential statutory authority to treat tribes as respective sovereign partners. We are respectfully looking for Congress to potentially significantly enhance the Corps' ability to execute the TTP, Chairman, by granting the agency the ability to enter into those self-governance contracts with tribes thereby respecting tribes' inherent sovereign nature.

Senator KELLY. Thank you, Governor Lewis.

Senator Cramer?

Senator CRAMER. Thank you, Mr. Chairman.

For all of you, I am quite sure there is going to be plenty of demand for both. There is going to be more demand than there is electricity. Keep them all going as long as you can.

I will start with you, Ms. Verleger. All of you are great. At least for nerds like us, it was fascinating to listen to all your stories and anecdotes.

Ms. Verleger, your insight has been really helpful to my team, as I mentioned earlier. I thank you for that, and I see why you are so valuable to them.

You provided some very instructive background. I loved the illustration of the sink and the two sides. With regard to that water supply rule, from a legal standpoint, again, you talked about Congress, but could you dig down just a little more for me on the legal objections to the supply rule in the first place? I think history is instructive. I am glad we had it withdrawn and wanted to ultimately make it permanent for everyone. Maybe give a legal analysis of why it was so objectionable.

Ms. VERLEGER. Thank you for the question.

Basically, by the Corps trying to usurp control over all of that water in the entire kitchen sink, that takes away the States' ability to allocate the water in accordance with their State laws. Every State allocates their water somewhat differently. Arizona is a little bit different than North Dakota. Generally we all use the prior appropriation system in the west. There are already mechanisms already set up in place to allocate water between users, especially in times of shortage. When the Corps comes in and tries to take control of the whole sink, that really takes away the States' ability to do any sort of regulation. That is contrary to State law.

Senator CRAMER. Maybe even the Constitution.

Ms. VERLEGER. And the Constitution.

Senator CRAMER. I was going to ask you about the Western Water Cooperative Committee, which again, the Corps wasn't crazy about our doing. Their sense was we can with attorneys general and Governors in individual States.

Tell me how you see the new committee working and why it might work better in getting better cooperation with the Corps.

Ms. VERLEGER. I see it working as, the committee appoints, there is one person appointed by the Governor and one appointed by the attorney general from each of the States. Those are supposed to be people who actually have technical expertise. These are not meant to be political appointments but people who are actually going to be able to dig down into the weeds with the Corps of Engineers' staffers, discuss the problems, and try to find solutions.

Also, they are required to report to Congress every year after we have the meeting about whatever it is that the committee talks about. I expect it to be focused a lot on water supply issues, but there is no language in the bill that says it has to focus on water supply issues. I think we can maybe broaden out from that and see where there is conflict.

Senator CRAMER. I appreciate that. I am looking forward to being in the middle of that quite honestly, so thank you for your work on that.

Dr. Travnicek, thank you for your work on the Snake Creek Embankment and for understanding my illustration. Dig down a bit more for me on what an EA should include in terms of information. Unfortunately, General Spellmon lifted the time, provided more time for comment. It is kind of fun, this is how it works in North Dakota. I text the Governor, the Governor calls Andrea, and pretty soon we are getting more information. Fortunately, what they ignored first go round, they are now asking for in the second go round.

Tell us a little bit about that additional information. That is, by the way, it is their charter, right?

Ms. TRAVNICEK. Right. Senator Cramer, thank you for that question.

Yes, as we are looking at the Snake Creek Embankment and the economic analysis that goes with it, right now the Corps is looking at the economic analysis just from the dam safety perspective, so the loss of life.

I mentioned in the testimony that there are multiple purposes associated with this embankment. Looking at it from that water supply, recreation, fish and wildlife perspectives, that is why we have the concerns. That is why we reached out to you and the Governor's office looking for that extension.

We had requested seeing the data that was associated with the economic analysis and what that looked like. We did have to sign an NDA associated with the extra information. My team was able to dive in, working with Garrison Diversion Conservancy District as well, on what those numbers are.

We feel that if there was an opportunity to make sure we are looking at this from a multiple purpose perspective versus just the dam safety, loss of life perspective, we would be above that 1.0 that is needed for the benefit cost ratio to move forward with a structural fix versus an operational fix.

Senator CRAMER. Thanks for that. I think in the next round I may come back to that and drill down a little more on things like loss of economic opportunity if you do not have the water.

Thank you.

Senator KELLY. Thank you.

Senator PADILLA.

Senator PADILLA. Mr. Chairman, thank you for holding this hearing. As you and I together, the Senators representing California and Arizona during this 1,200 year mega-drought, we know all too well the Federal response to drought and water management requires a whole-of-government approach based on science and data.

Governor Lewis, I particularly want to thank you for being here today. Thank you for your work on behalf of the Gila River Indian Community to elevate tribal voices within the Colorado River discussion and for being so proactive in finding solutions to the crisis. I look forward to working together to ensure the sustainability of the Colorado River for many generations to come.

In California, the Army Corps works closely with State and local agencies to improve, among other things, the forecasting of atmospheric rivers which are often described as rivers in the sky, rivers that can carry as much water as 15 Mississippi Rivers. They produce most of the rain and snow that the West depends upon each and every year.

The research conducted through the Forecast Informed Reservoir Operations program by the Corps, in partnership with State and local agencies, has enabled water managers to retain water that otherwise would be needlessly released, resulting in not just cost savings, but more importantly, a more reliable water supply while also preventing and enhancing flood control capabilities.

My first question is for Ms. Verleger. As you stated in your testimony, western States experience great variability in precipitation which has serious impacts and consequences for the management of water projects. How critical is FIRO for effectively managing drought and flood operations across the West?

Ms. VERLEGER. Thank you for the question. I would say it is very critical for States in the West. I understand that NOAA has submitted a report to Congress recommending a pilot project for improving the western S2S, which is subseasonal to seasonal forecasting, to support water management.

The Council would recommend that the Corps should enter an agreement with NOAA to partner on that project and tailor it to ensure it supports the FIRO, Forecast Informed Reservoir Operations.

Senator PADILLA. Thank you for that. I am looking forward to following up with you on those items.

In addition, there is a strong and growing interest across not just California, but beyond, in understanding the broad benefits of flood-managed aquifer recharge or flood-more projects. Flood-more projects use flood water from rainfall or snowmelt for managed aquifer recharge on agricultural lands and working landscapes, including refuges and floodplains. Flood-more projects demonstrate how natural infrastructure can make flood impacts, maximize water retention and provide habitat benefits for fish and wildlife.

This question is for you, Ms. Plumer. Can you speak to how water conservation and drought provisions included in the 2022 WRDA will help stakeholders across the west implement watershed-scale, multi-benefit projects to mitigate climate impacts?

Ms. PLUMER. Thank you, Senator Padilla, for that question.

Exactly in line with the testimony we provided, tremendous built-up authorities over multiple WRDAs in support of these levels of projects. We are strongly supportive of the vast range of authorities across the Continuing Authorities Program such as Section 206 that I mentioned in my testimony, aquatic ecosystem restoration, to provide the tools for non-Federal partners to do things like wet meadow restoration, flood plain restoration and really look at these abilities for natural features that exist in the landscapes today to be restored and do more long term water storage, water conservation that takes some of these fluctuations out of the water that we are seeing right now, of the vast changes happening between atmospheric conditions, such as facing California and these mass flooding events that are happening.

Really holding, storing, and slowing the water over long periods of time and really tapping into the large expanse of authorities that the Corps, this committee and other efforts that Congress that has pushed the Corps on to think again about these natural features and nature-based solutions to these types of conservation objectives for our systems in the west.

Senator PADILLA. Thank you. With the few seconds I have left, I am going to squeeze in one more question. I will not stick around for a second round.

To followup, Ms. Plumer, as we speak, the Corps is managing the flows of four reservoirs to minimize flood risk by low-lying Central Valley communities in California facing potentially catastrophic spring snowmelt.

How can managed aquifer recharge near Corps facilities such as those in California help mitigate flood risks for these types of communities?

Ms. PLUMER. Thank you again, Senator.

Again, I think it is very much about slowing the water down, storing it, and utilizing the features we have on the landscape to store that water for future use, so, thinking about geologic storage, combined with things like wet meadow storage.

Also, we are very focused on ensuring wildfire resilience and that our forest systems are able to store the water and snowmelt and that there is a slower pace in terms of hitting the reservoirs. Sedimentation, for our interests, in terms of recreation and how sedimentation impacts reservoirs and the health of hunting and fishing on our systems is another area of focus. Putting in these natural features blended with the structural features is a win-win in terms of reservoir health and storage.

Senator PADILLA. Thank you very much.

Thank you, Mr. Chairman.

Senator KELLY. Senator Ricketts.

Senator RICKETTS. Thank you, Mr. Chairman. Thank you very much for holding this, and Ranking Member Cramer, as well, for this important talk about water resources. It is something that is certainly very important to Nebraska.

Nebraska has a long history of managing our water in a responsible way. In fact, the Daugherty Water for Food Institute has looked at our farmers' crop water productivity which is how much water our farmers are basically using to be able to grow corn and soybeans. From 1990 to 2014, it has increased by 75 percent which

means we are being more productive and growing more crops with less water.

Nebraska has had a system of water management in place through 20 local natural resource districts for over 50 years that has helped us manage our overall aquifer to keep it within 1 foot of where it was in the 1950's, where States like Colorado have drained their aquifer down by nearly 14 feet.

We have worked with surrounding States like Wyoming and Kansas to create compacts. In fact, we have a compact with Colorado that goes back 100 years that entitles us to water on the South Platte River which comes from the Rockies through Colorado into Nebraska.

Actually, in years like the past couple years, we have had drought. At one point on the South Platte River, I saw there was no water coming across that, even though Colorado is supposed to be giving us 120 cubic feet a second during the summer. We can get even more in the non-irrigation season if we have built a canal which we are undertaking to do.

In fact, the compact from 100 years ago gives us the ability to build a canal in Colorado to Nebraska to a reservoir system. We started funding for it when I was Governor. This legislature has significantly increased backing for that project so we can continue to make sure we get the water for our State. That is going to impact drinking water all the way to Lincoln and Omaha as well.

We are talking about water and Nebraska. I know it is all about you, Senator Cramer, but North Dakota. I am going to get there.

Ms. TRAVNICEK, you talked about the Army Corps and I think the Snake Creek Embankment and the uncertainty they were creating by not appropriately looking at the types of ROI. What can Congress do and this committee do to make sure that we are properly enforcing the Water Resources Development Act? Are there more things we could be doing to be proactive here in this committee or in Congress?

Ms. TRAVNICEK. Senator, thank you for the questions.

I think what would be beneficial is just making sure it is fully clarified. Clearly with the last Water Resource Development Act for 2022, there was discussion, I think Senator Cramer included, related to the economic analysis. They decided to take it at a smaller lens just looking at one authority versus the multiple authorities.

I think trying to figure out the appropriate authorization and can that be expanded to multiple purposes. I think that is where that would be helpful, making really crystal clear, if you have these projects that have multiple purposes, why are we not looking at it as a whole.

Senator RICKETTS. What has been your response in working with the Army Corps of Engineers? What have they been saying?

Ms. TRAVNICEK. Senator, the last discussion we had last week in regard to the economic analysis, where they really did just focus on the one element, the dam safety, loss of life for the economic analysis. That is where we, as a State, continue to impress on looking at all the other authorized purposes that are associated with it, especially the water quantity side of things.

Senator RICKETTS. They have not acknowledged yet the other purposes? They have still only acknowledged the one?

Ms. TRAVNICEK. Senator, they talk about the multiple purposes, but they do not include it in the economic analysis.

Senator RICKETTS. What do we need to do in WRDA to be able to make sure they are recognizing those other purposes?

Ms. TRAVNICEK. Senator, I think making it crystal clear to make sure they are looking at the multiple purposes.

Senator RICKETTS. Write it into the language when we update it. Got it.

Ms. TRAVNICEK. Yes.

Senator RICKETTS. Ms. Verleger, can you talk a bit about what your experience with the Army Corps of Engineers has been like when you have had your conversations with them?

Ms. VERLEGER. Thank you for the question. I think it depends on who has been in charge and where we have been in the process. The problems we have been having over water supply in North Dakota have dated back at least to the time I have been there, which is about 14 years. I know we have gone through this same round of things back in the 1980's. I wasn't there, but I have all the documents and history.

A lot of the problem seems to be, we talk to the staff level. They tell us, well, that is not our decision; that is a headquarters decision. Then we talk to headquarters and they send us back. There is a lot of bouncing around back and forth trying to even get to the right person who can help us.

That has been a problem. I am hopeful the Western Cooperative Committee will help solve that problem, because those are the people who are supposed to be in charge and helping us.

Senator RICKETTS. Do you agree with Dr. Travnicek's assessment, though, that more clarification in WRDA will be helpful to that?

Ms. VERLEGER. I do agree with that assessment, yes.

Senator RICKETTS. Great. Thank you, Mr. Chairman.

Senator KELLY. Thank you.

Ms. Meyers, you discussed in your opening remarks work that SRP has done with the Corps to update flood control manuals. I want to get into that a bit more.

Across all your reservoirs at SRP, how much storage capacity do you have to keep available for flood control management? Then can you explain how the Army Corps Flood Control Manuals impact the river operations?

Ms. MEYERS. Thank you, Chairman Kelly.

Of our seven reservoirs we operate, only one has dedicated flood control space. That is Theodore Roosevelt Dam. There are 550,000 acre-feet of flood control space in Theodore Roosevelt Dam. That is operated pursuant to our Water Control Manual with the Corps of Engineers and the Bureau of Reclamation.

Senator KELLY. Beyond the Army Corps telling you through these flood control curves how much storage capacity you have to have for flood control, is there anything more that affects your operations or is just having that number based on the existing curve?

Ms. MEYERS. Today, we operate that, the Flood Control Manual dictates that we evacuate the space in Roosevelt Dam, which is the highest upstream dam on the Salt River, in 20 days. Our Flood Control Manual does allow for temporary deviations, as do many

other flood control manuals. We have been working with the Corps of Engineers and the Bureau of Reclamation to solidify that proposal. Our proposal is to use the bottom 20 percent of that space and extend that release period from 20 days to 120 days. In Arizona, especially for our spring runoff which is what we had this year, some really intense spring storms, if we could extend the release period for 120 days until the summer, we could meet some real critical demand with that water supply.

Senator KELLY. How much water would that be?

Ms. MEYERS. About 109,000 acre-feet annually.

Senator KELLY. You mentioned that in your opening remarks.

When was the last time the Army Corps did an update for one of its manuals?

Ms. MEYERS. I can only speak for our manual but I know that it is not unusual for the Corps to go for many decades if there is no substantive changes to the reservoir system and not update their manuals. Our manual was established in 1997. This is our first relook at that.

Senator KELLY. It has been over 25 years since that has been updated. With that 550,000 acre-feet of available storage for flood control, meaning if you could, if you need to, you could flow that amount of water and it is not going to flood, how often maybe have you exceeded that?

Ms. MEYERS. This year actually the elevation rose to about 6 feet in the flood control space. The total is 24 feet. That is the highest elevation we have been in the flood control space in Roosevelt Dam.

Senator KELLY. That is 25 percent, essentially, if you are just thinking about linear feet?

Ms. MEYERS. Yes.

Senator KELLY. About 25 percent of what you have available for flood control, you actually used going back how far?

Ms. MEYERS. To the 1990's when it was modified.

Senator KELLY. Since the 1990's.

Ms. MEYERS. The fifth largest city in the Country is just downstream of this dam, so there are significant benefits from the flood control space.

Senator KELLY. Do you now feel you can modify that to be more favorable toward water storage as opposed to flood control?

Ms. MEYERS. We certainly feel that this bottom 20 percent, the lowest 5 feet, is a good place to start. Our proposal is to do a 5-year plan and we can enter into flood control space up to three times during that. We will get some really good data and information from that. If it is successful, we will move forward with a long-term modification to the Water Control Manual.

Senator KELLY. Was that enabled by what we did in the 2020 WRDA?

Ms. MEYERS. Yes, sir, it was. That did allow us, the Salt River Project, to work more closely with the Corps and the Bureau of Reclamation on the reevaluation.

Senator KELLY. Do you feel like we are moving in the right direction on this?

Ms. MEYERS. Yes, I do.

Senator KELLY. Thank you, Ms. Meyers.

Senator Cramer?

Senator CRAMER. Thank you again, Mr. Chairman.

Dr. Travnicek, I wanted to talk a little more about the other factors that should be in the economic analysis. Your discussion with Governor Ricketts reminded me there is nothing more feared by the Corps of Engineers than a Governor who becomes a Senator and gets on the EPW Committee.

[Laughter.]

Senator CRAMER. Governors always have all this experience and pent-up frustration they want to take out.

However, I thought the discussion was great because I think both Jennifer and Andrea gave the answer, but the Corps still didn't seem to be hearing our voice in the mandate, you know, you have to consider these other things.

However, this is where hope lies, in my view. The Western Water Cooperative Committee, where Governors and attorneys general appoint these people, the reason the Corps leadership did not want to do it is because they like talking to each Governor one at a time, or staff level discussions one at a time.

As a group, the West, together, strong bipartisan as we notice in this room, while aren't identical, we have similar concerns. That is why we created this committee that will answer to both the Corps and then to Congress so we will be able to be kept up to date on how they are responding so that we hopefully can make crystal clear, Dr. Travnicek, what they are either meeting or not meeting.

Now, I am going to be hopeful because I am a hopeful person. I agree with several of the witnesses that say right we have right now pretty good leadership. I think we do at the Corps. I have great respect for General Spellmon, I have great respect for Secretary Mike Connor.

I am really hopeful. Secretary Connor having been involved in other agencies, Interior and understanding the role of States and the Federal Government, and natural resource management, I am going to be hopeful, but will reserve the tough ones for you, Governor.

Maybe, Dr. Travnicek, just expand a bit more. Having been an economic development director, in the role of water, obviously irrigation is critical. Obviously municipal use is a really big deal. Both are big economic drivers that should be considered as part of any analysis.

Beyond that, there is the whole role of industrial development. It is hard to measure what would have been possible had we had the water where we needed the water, for example. I think of all the projects that probably have gone by the wayside because we did not have adequate water.

Can that be a part of the analysis? I want to have integrity. Can that be a part of it, if you could document projects that are either in the docket or the queue or lost opportunities if there was just a better supply? Ms. Travnicek. Thanks for the question.

That would be our hope. We are hopeful as well. Some of the discussions related to that, knowing that the water supply projects that we have been working on, knowing we have had authorization from 1965, in order to use the McCluskey Canal, in order to get water out east to the Farber region, to the Grand Forks region, so

trying to get water out east is for 50 percent of the population of North Dakota. We have been trying to move those projects forward.

It has been in the works a long time. We hope they would take that into account for the economic analysis.

Senator CRAMER. Is there anything you would add to that, Jennifer? Are we hopeful about the leadership of the Corps right now and maybe they are going to listen a little better?

Ms. VERLEGER. Yes, Senator, I am always hopeful that leadership at the Corps will be helpful to us. I would echo your comments about General Spellmon. He has been very good to work with, and has been helpful in listening to the State's prerogative.

Senator CRAMER. My observation, and of course again, I look to Governor Ricketts because he has so much experience with the Omaha office. I think over the generations of leadership, we can always get along with Omaha. It is when it gets to Oregon or Washington that it gets more complicated.

That is enough for me. I am grateful to all of you. I think your testimony has been great. I am ending on a note of optimism.

Senator KELLY. I will recognize Governor Ricketts.

[Laughter.]

Senator RICKETTS. Senator now, but I would agree with Senator Cramer's statement about when you have a little bit of knowledge, from personal experience, it certainly gives you a background in it.

That is actually one of the areas I want to hit upon. I will say that in the last few months, we have seen a big change in the Corps in Nebraska with regard to more timely responses to getting things done.

I do echo your point about some of the leadership there is maybe a bit more responsive. I can tell you, for example, in the past, we had a permit that took 6 years to issue that was for just raising the levees around Offutt Air Force Base. The Corps did not give that permit in a timely manner, we had floods in 2019 that did \$1 billion in damage. It cost the taxpayers \$1 billion because they were not timely with that.

One of the challenges I think we have, and Dr. Travnicek you referenced the Flood Control Act of 1944, where it directs the Corps to protect against flooding, protecting life and property. Of course, one of the other functions of the Corps is navigation.

There was also a court case in Minnesota that directed the Corps to also take into account the Endangered Species Act. I think this is an area where we, in Congress, have to be thinking about how we may be hampering the Corps in its mission. Congress has never dedicated which of those is a priority, flood control, navigation, or endangered species. The Corps has to juggle all those without direction from Congress. That is an opportunity for perhaps this committee to think about that.

In your experience in North Dakota, can you think of projects that were delayed because of the Corps having to juggle flood control, navigation, and endangered species?

Ms. TRAVNICEK. Senator, as we look at those types of projects, and we do have the authorized purposes associated with the Main Stem Dam, Lake Sakakawea within North Dakota that has all those different purposes, fish and wildlife, navigation, and flood control. We have been able to, in working with the Corps, they are

the ones that operate that system. As we look at other projects that could be delayed for permits, for instance, for Northwest Area Water Supply, in regard to getting a 408 permit in order to move forward with that project, that has taken over 2 years to get the permit that is needed.

It kind of depends on the situation and on the project, definitely recognizing they do have a lot of authorized purposes they have to be looking at, but also trying to make sure we are not delaying things in the process.

Senator RICKETTS. Ms. Verleger, do you have any experience with regard to the Corps and having to juggle flood control, navigation and endangered species and whether there are projects you can think of that were delayed because of that?

Ms. VERLEGER. Thank you for the question.

I cannot think of a specific project but we have had in North Dakota, we have had some issues with the Corps, disagreement, I would say, over endangered species, the Endangered Species Act. The Corps has a responsibility to meet the Endangered Species Act and those provisions. We do, of course, have threatened and endangered species on the Missouri River.

There is some disagreement about how much control that gives the Corps over certain activities they can do, projects, how they operate things. I think there is some disagreement there because I think the Endangered Species Act is somewhat used to further whatever purpose it is that the Corps is trying to further without looking at the holistic picture.

Senator RICKETTS. Some of the experiences I had as Governor of Nebraska were that without that clear direction from Congress with regard to what is the priority, you are really kind of left to the judgment of the Corps and they have multiple masters to serve here. It is, in fairness, difficult for them.

That also can drive projects, at least I have seen along the Missouri River and along the Nebraska/Iowa border where it is driving projects that lead to additional flooding. That is one of the things I think, again, this committee and this Congress can do, look at how we can prioritize that to prioritize protecting people and property overall. I do not know if you would have any further comment on that, either one of you. All right, great. I will turn it back to you, Mr. Chairman. Thank you.

Senator KELLY. Thank you, Senator.

Ms. Plumer, I am going to have some questions for you for the record. We have to go to an all-Senators briefing.

I want to thank all of our witnesses for being here and sharing your perspectives on what the Army Corps can be doing with their water management approach.

Before we adjourn, we have some housekeeping for Senators Ricketts and Cramer. We can submit written questions for the record by 4 p.m. on Tuesday, May 30, which is 2 weeks from today.

With that, this hearing is adjourned.

[Whereupon, at 3:52 p.m., the subcommittee was adjourned.]