Testimony of Federico Barajas, Executive Director, San Luis & Delta-Mendota Water Authority

Before the Subcommittee on Oversight and Investigations, United States House of Representatives

Oversight Hearing titled, "The Status of the Reclamation Fund and the Bureau of Reclamation's Future Infrastructure Funding Needs".

Washington, D.C.

July 24, 2019

Good morning Chairman Cox, Ranking Member Gohmert, and Members of the Subcommittee.

My name is Federico Barajas, and on behalf of the San Luis & Delta-Mendota Water Authority, I thank you for this opportunity to present this testimony on a matter of critical importance to our member agencies and the communities they serve: ensuring the reliability of water supplies to western water users and the role of the federal Reclamation Fund to accomplish this purpose.

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY BACKGROUND

Figure 1. San Luis & Delta-Mendota Water Authority Member Agencies

The San Luis & Delta-Mendota Water Authority ("Authority") was formed in 1992 as a California Joint Powers Authority, comprised of 28 public agencies that serve water to approximately 1.2 million acres

of highly-productive farmland in California's Central Valley, over 2 million people in California's Silicon Valley and over 200,000 acres of managed wetlands - the largest contiguous wetlands west of the Mississippi River and a critical stop for treaty protected migratory birds on the Pacific flyway. The Authority's membership comprises one of the most diverse collection of water users in the western United States and shares a set of common objectives – increasing water supply reliability in a complex and ever changing physical and regulatory environment. In addition to representing our member agencies on areas of common interest, the Authority operates and maintains a number of critical Central Valley Project water conveyance infrastructure facilities, including the Jones Pumping Plant, the Delta-Mendota Canal, the O'Neill Pumping Plant, and the Delta-Mendota/California Aqueduct Intertie, under an agreement with the U.S. Bureau of Reclamation (Reclamation).

Central Valley Project Facilities Operated and Maintained by the Authority

Jones Pumping Plant

The C. W. "Bill" Jones Pumping Plant lifts water from the Sacramento-San Joaquin Delta into the Delta-Mendota Canal. The plant, located about 12 miles northwest of Tracy, is essential for supplying agricultural, urban, and wildlife water to parts of the Delta and to the San Luis and San Felipe Units of the Central Valley Project (CVP).

Figure 2. C.W. "Bill" Jones Pumping Plant

The major portion of the water supplied to the Jones Pumping Plant pumps is derived from northern CVP reservoirs. The supply is routed across the Sacramento-San Joaquin Delta from the Sacramento River to the Old River through the Delta Cross Channel and the natural channels of the Delta. The intake to the pumps is about 9 miles northwest of Tracy.

Six pumps, each powered by a 22,500-horse-power electric motor, lift Delta waters about 200 feet from the intake through three discharge pipes, which then carry it up a distance of about 1 mile to the Delta-Mendota Canal. Power to run each pump is generated by CVP facilities.

The total capacity of the plant is about 5,200 cubic feet per second, each unit with a pumping capacity between 850 cubic feet per second (cfs) and 1,050 cfs.

Delta-Mendota Canal

The Delta-Mendota Canal carries water southeasterly from the C.W. “Bill” Jones Pumping Plant to the Mendota Pool. The canal, located along the west side of the San Joaquin Valley, is essential for irrigation supply as part of the San Luis Unit and the CVP Delta Division.

Figure 3. Delta-Mendota Canal

Completed in 1951, the Delta-Mendota Canal is used for irrigation of land along the west side of the San Joaquin Valley and to replace San Joaquin River water stored at Friant Dam.

The canal is 116.5 miles long and terminates at the Mendota Pool about 30 miles west of Fresno. The initial diversion capacity is 4,600 cubic feet per second, which is gradually decreased to 3,211 cubic feet per second at the terminus.

Delta-Mendota/California Aqueduct Intertie

The Intertie is in an unincorporated area of the San Joaquin Valley in Alameda County, west of the city of Tracy, Calif. in a rural agricultural area on federal and state lands. A shared federal-state water system improvement project, the Intertie connects the Delta-Mendota Canals (DMC) (federal facility) and the California Aqueduct (CA) (state facility) and pumping station via two 108-inch-diameter pipes. The pumping station has a capacity of 467 cubic feet per second (cfs) up hill and 900 cfs gravity flow from the CA to the DMC. The Intertie is located at the closest point between the DMC and CA which is 500 feet horizontal and 50 feet vertical. The Intertie is downstream from C.W. "Bill" Jones and Harvey O. Banks pumping plants at DMC Mile 7.2 and CA Mile 9.

Figure 4. Intertie Pump Station located between the California Aqueduct and the Delta-Mendota Canals.

Jones Pumping Plant and the DMC are the primary federal water delivery facilities that provide water to CVP contractors south of the Bay-Delta. The Intertie provides redundancy in the water distribution system, allows for maintenance and repair activities that are less disruptive to water deliveries, and provides the flexibility to respond to CVP and State Water Project (SWP) emergencies. The contract was awarded in July 2010 and construction was completed in April 2012.

O'Neill Pumping Plant

The O'Neill Pumping Plant located about 12 miles west of Los Banos lifts water from the Delta-Mendota Canal into the O'Neill Forebay. This plant is essential for supplying water to O'Neill Forebay/San Luis/San Felipe Units of the Central Valley Project.

Figure 5. O'Neill Pumping Plant

Completed in 1968, this facility consists of an intake channel leading off the Delta-Mendota Canal and six pumping-generating units. Normally these units operate as pumps to lift water from 45 to 53 feet into the O'Neill Forebay. When water is released from the Forebay to the Delta-Mendota Canal, these units will operate as generators.

When operating as pumps and motors, each unit can discharge about 650 cubic feet per second and has a rating of 6,000 horsepower.

When operating as turbines and generators, each unit has a generating capacity of about 4,000 kilowatts.

WATER SUPPLY RELIABILITY

Magnitude and Frequency of Water Shortages

Over the past several decades, the imbalance between water demands and water supply availability in the San Joaquin and Silicon Valley has steadily grown, and the shortages in the future are expected to become even more severe. Reclamation faces similar challenges with respect to environmental water management. Reasons for the imbalance include reduced groundwater availability, revised CVP and SWP operations in response to regulatory and legal requirements, and climate change.

Reduction in Groundwater Availability

The most effective indicator of water demand and supply imbalance in the San Joaquin Valley is groundwater overdraft. Groundwater in the San Joaquin Valley has long been relied upon to support agricultural and urban needs and serve as back-up water supplies during drought periods, which is consistent with the original conjunctive management intent of many water supply projects in the region. Over the past two decades, groundwater overdraft in the San Joaquin Valley has significantly increased, predominantly as a reaction to water supply diversions from agricultural use to other beneficial uses.

In 2014, the State of California enacted the Sustainable Groundwater Management Act[1] (SGMA), which requires the development of locally-driven solutions that avoid undesirable conditions, such as reductions in groundwater elevation, land subsidence, reductions in groundwater storage, seawater intrusion to aquifers, degraded groundwater quality, and reductions in surface water supplies resulting from groundwater / surface water interconnections.

[1] https://www.waterboards.ca.gov/water_issues/programs/gmp/docs/sgma/sgma_20190101.pdf

SGMA requires the formation of local entities, called Groundwater Sustainability Agencies (GSAs), to develop and implement solutions that achieve sustainable groundwater conditions. Groundwater basins designated as high- or medium-priority and subject to critical conditions of overdraft, as shown in Figure 6, must be under the management of one or more approved Groundwater Sustainability Plans (GSPs) by January 2020 and in full compliance by 2040. The State of California has designated nearly every groundwater basin in the San Joaquin Valley as Critically Overdrafted or High Priority, underscoring the significance of SGMA implementation to the future of the Valley's people and its communities.

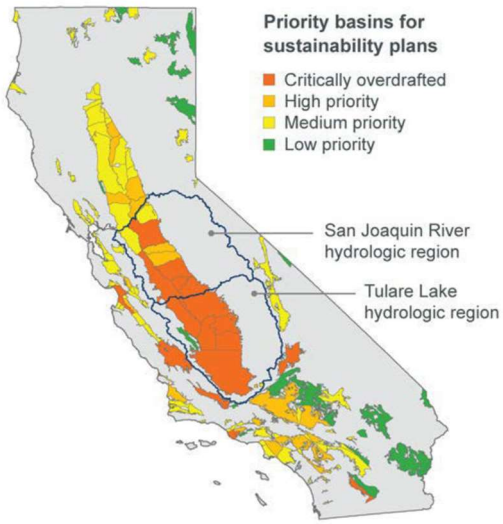

Figure 6. Priority Groundwater Basins

The impact of SGMA on the groundwater supplies available throughout the San Joaquin Valley will be revealed over time as GSAs identify sustainable groundwater pumping levels consistent with their GSPs. It is anticipated that allowable groundwater pumping will be reduced in all subbasins within the Valley, resulting in a significant reduction in overall water supply to the region.

A recent estimate of overdraft in the San Joaquin Valley by the Public Policy Institute of California (PPIC), as shown in Figure 7, shows that overdraft has significantly increased in recent years. The PPIC estimates that annual groundwater overdraft in the San Joaquin Valley over the years 2003-2017 was about 2.4 MAF/yr, nearly double the estimate for the period 1988-2002.

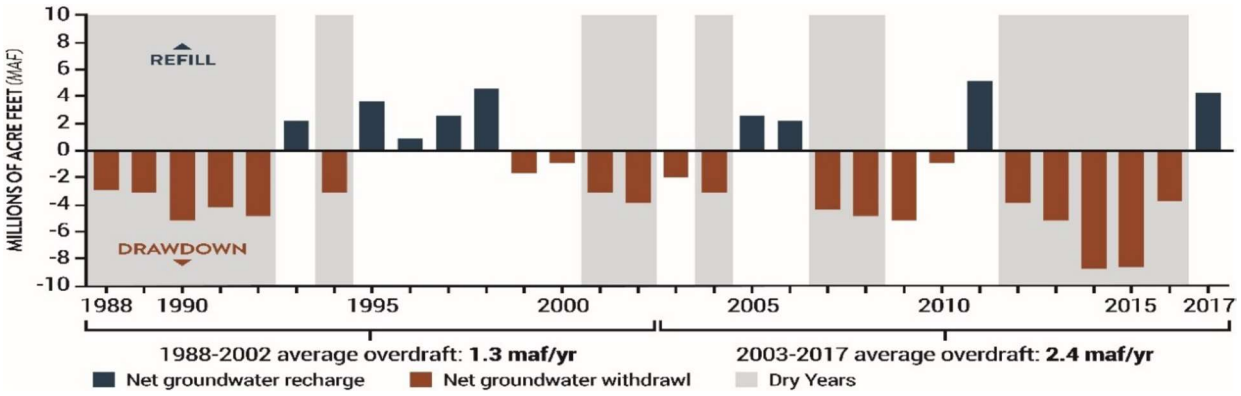

Figure 7. Groundwater Overdraft has Increased in Recent Years in the San Joaquin Valley

Source: Public Policy Institute of California, 2019

While the average overdraft estimated by the PPIC is startling, it does not tell the whole story. Several regulatory requirements implemented during the period from 2002-2017, gradually reduced the availability of surface water to the San Joaquin Valley. Consequently, any estimate of groundwater overdraft based on average water deliveries during this period are considered low.

Revised CVP Operations

CVP operations have changed significantly since the 1980s in response to statutory and regulatory requirements related to fish and wildlife protection, water quality and other environmental-related purposes. Examples include the Central Valley Project Improvement Act of 1992 (Title XXXIV, P.L. 102-

575) which dedicated 800,000 AFY of CVP supply for anadromous fish restoration in the Sacramento Valley, and additional CVP supply for Trinity River restoration and wildlife refuges throughout the Central Valley; California State Water Resources Control Board decisions that require Reclamation to meet flow and water quality standards in the Delta; and Biological Opinions issued under the Endangered Species Act including Reasonable and Prudent Alternatives (RPAs) and other requirements governing operation of the CVP in coordination with the SWP. As illustrated in Figure 8, revisions to CVP operations in response to these requirements contributed to a steady reduction in CVP south-of-Delta (SOD) agricultural water allocations.

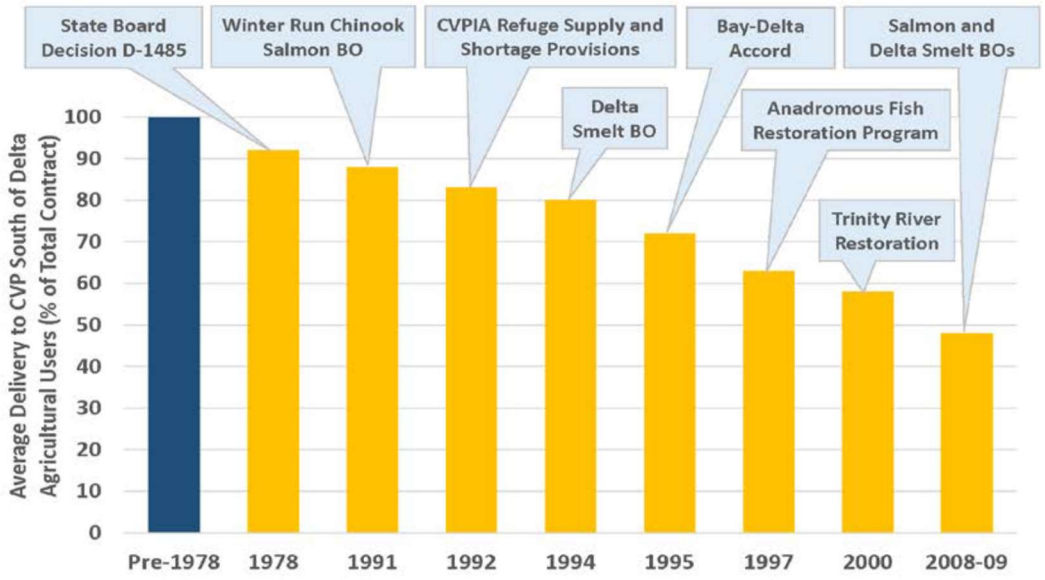

Figure 8. Average Annual CVP SOD Agricultural Contract Allocations under Regulatory Requirements

Sources: Pre-1978, CVP Water Delivery Records; 1978 – 2000, San Luis Delta Mendota Water Authority, extracted from various California Department of Water Resources (DWR) and U.S. Department of the Interior, Bureau of Reclamation (Reclamation) CalSim-II benchmark studies; 2008/2009, Reclamation & DWR CalSim-II Benchmark BO Study.

Under today's operating guidelines, water allocations to CVP SOD agricultural water contracts average about 45 percent of contract amounts and 75 percent to M&I water contracts and are prone to wide variability in response to hydrologic conditions. Recent amendments to the Coordinated Operations Agreement (COA) between the CVP and SWP have reduced the variability due to hydrologic conditions and slightly increased the long-term reliability of CVP SOD agricultural and M&I water supplies; however, significant water shortages will continue if no other actions are taken to address the imbalance.

On the east side of the San Joaquin Valley, implementation of the San Joaquin River Restoration Program (SJRRP) will reduce average annual CVP water supply deliveries from Friant Dam by as much as 200,000 acre-feet when fully implemented, which is about 16 percent of the water supplies available prior to SJRRP. While recovery of some of this supply is possible at downstream locations, opportunities are limited due to already constrained operations of the CVP and SWP. As shown in Figure 9, more than half of this reduction is currently being experienced and the full impact of SJRRP implementation is expected by 2030. Friant Division water delivery capability under SJRRP implementation is projected to be further reduced under future climate change conditions, which is estimated to result in reductions of over 32 percent compared to pre-SJRRP conditions.

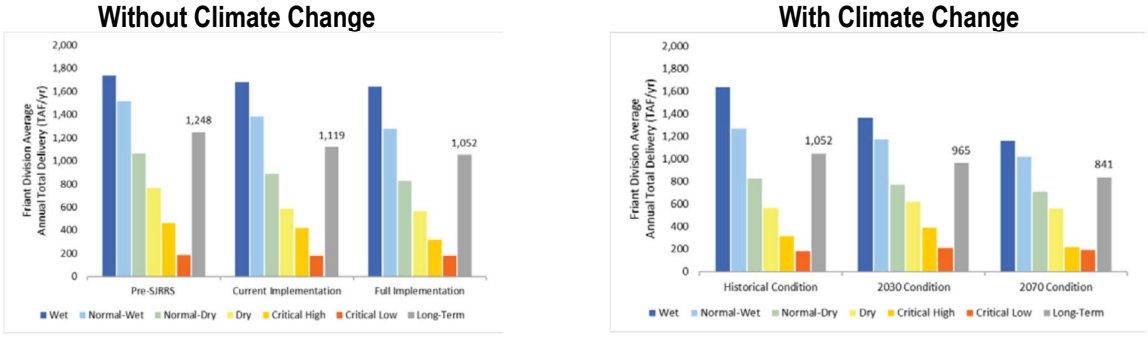

Figure 9. CVP Friant Division Delivery Capability with San Joaquin River Restoration Settlement Implementation

Land Subsidence

Land subsidence has been a persistent problem in the San Joaquin Valley and is exacerbated during drought periods, such as during 2012-2016 drought. Regional groundwater pumping increased significantly, particularly during 2014 and 2015 when CVP SOD and Friant Division deliveries were zero. **The increased reliance on groundwater induced rapid land subsidence in several areas of the San Joaquin Valley. Some areas experienced measured reductions in land elevation of one to two inches per month between May 2015 and September 2016**, as shown in Figure 10.

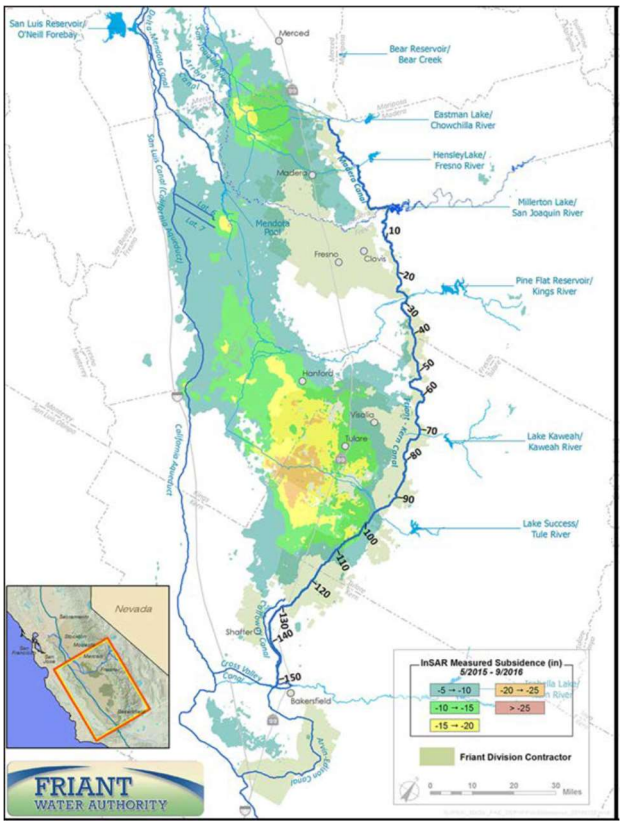

Figure 10. Land Subsidence May 2015-Sept 2016

Land subsidence is the surface manifestation of the soil compaction in clay layers within groundwater aquifers. Groundwater over-pumping reduces pressure, resulting in the compaction of clay as water is squeezed from pore spaces. Compaction of clay layers is typically inelastic and results in permanent land subsidence and the loss of groundwater storage capacity.

Recent land subsidence in the San Joaquin Valley lowered the elevation of regional water conveyance facilities, including the CVP Friant-Kern Canal and Delta-Mendota Canal, and the SWP California Aqueduct, causing reduced conveyance capacity. **In the case of the Friant-Kern Canal, capacity of the canal through the most subsided area is estimated to be about 40 percent of design capacity. In the case of the Delta-Mendota Canal, capacity has been reduced by an estimated 10-15 percent of design capacity.**

While the most recent drought may have abated for now, land subsidence has not ceased as ongoing over-reliance on groundwater continues. In addition, residual subsidence will continue for some time even after groundwater pressure has stabilized. Implementation of SGMA requirements will be strongly guided by concerns over the control and avoidance of future subsidence.

Climate Change

Existing imbalances in the San Joaquin Valley for both consumptive use and environmental purposes will be further exacerbated by projected climate change conditions. The Sacramento-San Joaquin Basin Study[2], completed by Reclamation in 2016, found that the Central Valley and regions dependent on the Sierra Nevada and Coast Range mountains for water have been facing rising demands for water from increasing populations, changes in land use, and growing urban, agricultural and environmental demands. These demands already exceed the capacity of the existing water management system to supply adequate water, especially in drought periods.

The Basin Study concluded that the Sacramento and San Joaquin river basins will likely face material changes in climactic conditions that include: increases in average temperatures, more variable precipitation and reduced runoff, declining snowpack with more moisture falling as rain, and increasing sea levels. The Basin Study concluded that if no actions are taken, water-resources conditions in the Central Valley will deteriorate during the 21st Century, as indicated by:

- Reduced water delivery and water quality
- Reduced reservoir recreation opportunities
- Reduced fish and wildlife habitat
- Increased threats to the survival of threatened and endangered species.

Nature of Imbalances

Imbalances in the San Joaquin Valley are principally driven by water supply shortages, as described in the preceding discussion. However, as evidenced during the recent drought, water supply shortages also caused severe water quality problems, particularly for disadvantaged communities that rely on groundwater, and required emergency replacement supplies. While the implementation of SGMA will help to address the response, water quality concerns in the San Joaquin Valley are significant and will need to be addressed in correlation to water supply shortages.

Severity of Potential Consequences of the Imbalances

In 2018, San Joaquin Valley water users estimated the magnitude of water supply and demand imbalances in the eastern San Joaquin Valley based on the following Planning Condition:

- Full implementation of the SJRRP, not including recapture or recirculation of Restoration Flows that could reduce water shortages to Friant Contractors or implementation of projects authorized in Part III of the SJRRS Act
- Projected climate change for the year 2030 based on DWR developed data sets
- Potential shortages to San Joaquin River Exchange Contractors based on recent COA amendments
- Restoration of the Friant-Kern Canal to original design capacity

Water users considered this evaluation, in combination with information prepared by the Public Policy Institute of California, to estimate annual groundwater overdraft in the San Joaquin Valley at about 3 MAF/yr. Reducing 3 MAF/yr of water use in the Valley to balance with available supply would cause the retirement of about 1.1 million acres of highly productive agricultural land. **The retirement of over 1 million acres of agricultural land would have devastating social, economic and environmental effects**

[2] https://www.usbr.gov/watersmart/bsp/completed.html

throughout the San Joaquin Valley, and potential impacts to the safety and reliability of the nation's food supply.

CENTRAL VALLEY INFRASTRUCTURE NEEDS

In order to address water supply and demand imbalances in the San Joaquin Valley, regional projects must be developed and implemented to mitigate the impacts from the implementation of SGMA, regulatory and environmental restrictions, and long-term hydrologic changes resulting from climate change.

Valley water users have considered potential achievable solutions to the water demand and supply imbalances, and identified a wide range of projects and related actions that have the potential to increase water supply to the San Joaquin Valley. Table 1 summarizes potential projects, including their cost, timeframe for implementation and annual amount of water supply that could result. As indicated in Table 1, addressing this imbalance will require a renewed focus on major conveyance projects that provide better capture and recharge of Delta surplus supplies, and projects that increase the capacity for above and below ground storage of surface water, necessitating increased opportunities for federal partnerships and increased federal expenditures for water supply projects.

Table 1. Potential Infrastructure Components to address Long-Term Water Supply Reliability

Major Conveyance Improvements for Better Capture and Recharge of Delta Surplus			
Project	**Cost**	**Timeframe**	**Annual Water Supply Benefit**
Delta-Mendota Canal Capacity Correction	Not estimated	3-5 years	100 TAF
Friant-Kern Canal Capacity Correction	$200-$430M	3-5 years	150 TAF
California Aqueduct Capacity Correction	$2B	3-10 years	Not estimated
Mid-Valley Canal	Up to $600M	5-10 years	400 TAF, through some combination of improvements to Delta capture and regional conveyance to direct and in-lieu recharge projects
Trans-Valley Canal			
Local Conveyance/ Tie-ins to Recharge Areas	Not estimated	Varies, multiple projects	
Increase Permitted Pumping (South Delta Improvement Program)	$110M	3 years	
Enlarge Delta-Mendota Canal	Not estimated	5-10 years	
California WaterFix (prior)	$16.7B	15+ years	1.2 – 1.4 MAF
Potential Total from Major Conveyance Improvements			**Over 900 TAF**
Increased Capacity for Above and Below Ground Storage of Surface Water			
Sites Reservoir	Up to $3B	10+ years	30-100 TAF
Raise Sisk Dam (San Luis Reservoir) and Local Reservoirs (e.g. Del Puerto Canyon, Pacheco)	Up to $3B	5-10 years	10-85 TAF
Other CALFED Reservoirs	Up to $5B	10+ years	Up to 500 TAF
Potential Total from Increased Storage Capacity			**Up to 675 TAF**

IMPORTANCE OF WESTERN WATER INFRASTRUCTURE

Many communities of the semi-arid and arid West – as well as the farms and ranches they are intertwined with – owe their existence, in large part, to the certainty provided by water stored and delivered by Reclamation and other state and local water storage projects. The federal government has an enduring role in water supply infrastructure development and management that, consistent with state water laws, includes working with local water managers on a policy level and, in partnership with them, providing available federal funding and federal cost-share opportunities in support of their efforts to secure a stable and sustainable water supply.

Water managers from throughout the West are actively investing in new water supply options, embracing technology, utilizing green infrastructure and looking to use water as efficiently as possible. Thanks in large part to these efforts, water usage in the U.S. for agricultural, industrial and municipal uses have declined since the mid 1980's while at the same time populations, crop production, and demands have increased. Local water managers are looking to their federal partners to ensure that this impressive track record of water innovation can continue and be improved.

Water is the lifeblood of our nation. Without reliable water, every sector of our economy would suffer – from agriculture, to manufacturing, to high-tech. Food cannot be grown, businesses cannot operate, and homes and schools cannot be built or operate without water. Critical water infrastructure must be maintained and modernized to ensure the delivery and safety of water today and for future generations.

Western water managers face significant regulatory and policy-related challenges. Water infrastructure that was built early in the last century is aging, and once-reliable federal project funding and loan programs have been greatly diminished. Meanwhile, little progress has been made at the federal level towards developing new and improved water infrastructure to keep up with the growing water demands of expanding cities, energy production, and environmental needs. While water conservation, water efficiency, and water transfers are important tools for addressing certain water supply challenges, these tools must be balanced with supply enhancement measures that provide long-term solutions for the varying and specific circumstances in the West.

Water infrastructure is perhaps the most important, yet overlooked, form of infrastructure in our nation. An investment in water infrastructure is an investment in the very foundation of our nation's economy, its health, and its future. Access to a sustainable supply of water is a fundamental necessity for all economic development. Conversely, adverse economic consequences are certain if we do not invest and reinvest in our water infrastructure. According to the American Society of Civil Engineers 2017 Infrastructure Report Card, the nation's "drinking water", "dams" and "levees" categories all received a score of "D". According to the report, there were some 15,500 high-hazard dams in the US in 2016.

Western irrigated agriculture is a significant contributor to the national economy. The Family Farm Alliance in 2015 published "The Economic Importance of Western Irrigated Agriculture" (prepared by the Pacific Northwest Project), a white paper specifically drafted for policy makers seeking to better understand the direct economic impact of Western irrigated agriculture and to acknowledge the growing chorus of voices bringing attention to food security and irrigated agriculture as a national economic issue. For the 17 Western states studied in the 2015 report, the total household income impacts from irrigated agriculture, associated service industries, and food processing sectors is $172 billion annually. Irrigated farming and ranching is a huge economic driver in the West, particularly in rural communities. Further the fact that Americans spend less of their disposable income on food than any other nation in the world ensures a vibrant, consumer-driven economy. However, this economic force would virtually disappear, along with the rural American communities dependent on farming and ranching, if the water

infrastructure that supports it crumbles. Given the magnitude of the food security issue to the nation's economic and social wellbeing, policy makers must prioritize protection of our water infrastructure.

The State of Water Infrastructure in the West

Water challenges in the West are significant and daunting. These challenges are not unique to just California; rather they impact every state west of the 100th Meridian. It is critically important to have sufficient infrastructure in place to optimize water supplies during constantly changing climatic conditions. The need is obvious, and this belief is shared by many in the West. For example, in March, the Family Farm Alliance – working with the California Farm Bureau Federation and Western Growers Association – transmitted letters signed by over 100 national and Western agriculture and water organizations, calling upon Members of Congress to develop an infrastructure package that addresses water infrastructure needs for storage and conveyance.

Many of the Bureau of Reclamation's facilities are between 50 and 100 years old. Reclamation has an infrastructure and maintenance backlog of approximately $3 billion. Such aging infrastructure presents a further challenge because it requires ever increasing maintenance and replacement investments. These water resource facilities are dispersed throughout 17 western states and have an original development cost of more than $21 billion. As of 2013, the replacement value of Reclamation's infrastructure assets was $94.5 billion. Investing in our existing, yet aging infrastructure on the front end will save taxpayers' money in the long run and allow us to preserve it and the many benefits it provides for future generations.

As Reclamation Commissioner Brenda Burman said in June of 2018: "We need to think ahead 20, 40, 50 years and enhance water infrastructure for reliable water supplies in the future."

CONCLUSION

Federal investments in water supply infrastructure have not kept pace with needs across California and the rest of the West. Regional economies reliant on Reclamation project water have suffered as a result. In addition to aging infrastructure reaching the end of design life, additional projects will need to be constructed to minimize impacts to regional economies and potential disruptions to national food supply. We are reliant on infrastructure investments made by our parents' generations and new, innovative ways of incentivizing local, state, and federal partnerships to fund the next generation of water infrastructure will need to be made.

Earlier in this Congress, several organizations, including the Family Farm Alliance, supported legislation that would extend the Reclamation Water Settlement Fund, which allows for direct access to the Reclamation Fund. The Alliance supported this legislation, since tribal water rights settlements will continue to move forward, with or without the fund, and future settlements that are authorized by Congress will hit Reclamation's budget even harder. However, that support was conditioned with a request that Congress apply a similar approach in addressing and modernizing aging water structures utilizing existing balances in the Reclamation Fund.

We are pleased to see your committee seriously address this concern with today's hearing. Increasing access to funding from the Reclamation Fund to increase water infrastructure investment would protect our existing investments in the most productive food supply system in the world, spur regional economic development and provide increased opportunities for future generations to experience the American dream.