NORTH KERN WATER STORAGE DISTRICT

September 2020

Calloway Canal Lining : 7th Standard Road to 8-1 Backup Weir

North Kern Water Storage District

Project Location–Southern San Joaquin Valley, California

Application for WaterSMART Grants:
Water and Energy Efficiency Grants for Fiscal Year 2021
FOA No: BOR-DO-21-F001

Applicant: North Kern Water Storage District
33380 Cawelo Avenue
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Calloway Canal Lining: 7th Standard Road to 8-1 Backup Weir

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1. Technical Proposal

1.1 Executive Summary

Date	September 17, 2020
Applicant Name	North Kern Water Storage District
City, County, Sate	Bakersfield, Kern, California

About a decade ago, North Kern Water Storage District (NKWSD, North Kern, or District) commenced implementation of a plan of water delivery efficiency improvements, which identified concrete lining their major canal, the Calloway Canal, as a top priority. Because of the scope and cost, these improvements are being made incrementally as funds are available. Accordingly, North Kern proposes to leverage its resources in a cost-shared Project with the United States Bureau of Reclamation (USBR or Reclamation) to concrete line 6,744 linear feet (LF) of a currently unlined portion of the Calloway Canal, located in Bakersfield, California. The proposed Project, *Calloway Canal Lining: 7th Standard Road to 8-1 Backup Weir* (Project), is expected to save **2,366 acre-feet (AF)** of water annually by reducing seepage. This Project is designed to conserve and use water more efficiently, which is consistent with the objective of the subject Funding Opportunity Announcement (FOA) BOR DO-21-F001. It is estimated that the Project could be completed within 24 months of the award date. Assuming funding is awarded, and an agreement is signed by April 1, 2021, it is anticipated that the Project could be completed by March 31, 2023 (a detailed schedule is included in Section 1.4). The Project is not located on a Federal facility.

NKWSD is requesting $2,000,000 in funding from USBR to implement the *Calloway Canal Lining: 7th Standard Road to 8-1 Backup Weir* Project as described in this application. The District will fund at least 50 percent of the total Project budget. A detailed budget is included in Section 2.

1.2 Project Location

The Project is located within the District's boundaries in Bakersfield, a city in Kern County, California. Kern County is in the southern portion of California's San Joaquin Valley. The District is in northern Bakersfield, between Highway 43 to the west Highway 99 to the east and the cities of Delano to the north and Bakersfield to the south. The Project starts at 35° 26.514'N and 119° 7.829'W, and ends at 35° 27.382'N and 119° 7.998'W.

Figure 1, included immediately following Section 1.4 , shows the location of the District. Figure 2 shows the location of the proposed Project. Figure 3 shows portions of the Calloway Canal that have been lined or are planned to be lined under previous and ongoing agreements with Reclamation.

1.3 Technical Project Description

The scope of the Project consists of lining 6,744 LF of the currently unlined portion of the Calloway Canal between 7th Standard Road and the 8-1 Backup Weir. The Project will be implemented under the District's direction. Ram Venkatesan, Deputy General Manager and California licensed Civil Engineer will serve as Project Manager and will provide oversight of the project including coordination with the designated construction manager and contractor.

Construction of the Project will be performed by a contractor that will be selected through a competitive bidding process. The construction contract will include furnishing and installing all components necessary to the Project. Consistent with 3.5 miles of previously lined portions of the Calloway Canal, construction will include trimming the canal to a trapezoidal prism with a 50-foot-wide bottom, 3-to-1 side slopes, and a nominal depth of 8.5 feet and then lining it with 4-inch thick unreinforced concrete. The construction contract will consist of preparing, modifying, re-shaping, and lining approximately 6,744 LF of existing canal including subgrade preparation; relocation of fill dirt; placement, compaction and grading of fill; and other necessary components as defined in the specifications that will be developed during the design phase. The contractor will also be responsible for securing necessary permits and including costs for permits in their proposal.

Costs for other tasks such as Grant Administration, Reporting, Environmental Compliance, Design, Labor Compliance, and Construction Management will be incurred by the District and are not included in this application budget as either Federal or Non-Federal funding, thus they are not described in detail herein. However, the District will comply with all requirements of an agreement including reporting deliverables and environmental documentation and compliance.

1.4 Evaluation Criteria

1.4.1 Evaluation Criterion A – Quantifiable Water Savings

Describe the amount of estimated water savings.

The amount of water conserved by the proposed Project is estimated to be an average of **2,366 acre feet (AF) per year**. The estimated water savings were calculated based on reduction of "irrecoverable" canal seepage (based on historical use of the Calloway Canal) and increased utilization of the Calloway Canal after it is concrete lined to convey imported State Water Project (SWP) water (on behalf of Cawelo Water District). Current losses and support of estimated water savings are included below.

Canal Lining

How has the estimated average annual water savings that will result from the project been determined? How have average annual canal seepage losses been determined?

Historical flow data were compiled (on a monthly basis) at various locations along the Calloway Canal as reported in the *North Kern Water Storage District Calloway Canal Diversion Summary* available in the annual *Kern River Reports* prepared by the City of Bakersfield. These data have been summarized in Table 1-1 for the period extending from 1990 through 2010. The tables referenced in this section have been included following section 1.4. This Diversion Summary indicates that the Calloway Canal has been predominantly used during "wet" hydrologic years and has been used sparingly during "dry" periods, largely due to the high seepage losses associated with its historically unlined condition.

Flow measurements at two locations along the canal (namely, the Buck Owens Weir and the Olive Drive Weir) were used to determine the average annual seepage losses. The amount of water lost due to seepage was calculated as the difference in water measured at the two weir locations, assuming evaporative losses are negligible. As summarized in Table 1-2, an average of 6,975 AF per year was lost to seepage in the 6.2 miles between the weirs. This equates to 1,125 AF per year, per mile of canal (6,975 AF / 6.2 miles). However, the average annual or monthly values are not reflective of daily seepage rates because the canal is only operated for parts of the year. Table 1-3 considers only the summer periods when the canal was operated for an entire month. During these periods, the average monthly loss was 1,994 AF per month or 322 AF per mile, per month. **This implies a daily seepage rate of 11 AF per day, per mile (transit loss reduction).**

As noted in the Diversion Summary (Table 1-1), Calloway Canal operations averaged 3.14 months per year, or 96 days per year. The length of the canal to be lined as part of the proposed Project is roughly 6,744 feet (or 1.28 miles). Therefore, based solely on the historical use of these facilities, the amount of avoided seepage attributable to the proposed Project can be estimated as **1,352 AF/year.**

Additionally, Table 1-1 shows that the average annual flow between the two weirs is 31,458 AF. Therefore, the percentage of the historical flow to be conserved by lining is about 2.45% (1,352 acre-feet of avoided canal seepage / 31,458 acre-feet annual flow).

11 AF/day/mile x 1.28 miles x 96 days/year = **1,352 AF/year**

Furthermore, imported SWP water conveyed in the Cross Valley Canal has historically been delivered to Cawelo Water District (Cawelo or CWD) through North Kern's system by pumping water from the Cross Valley Canal (CVC) to the Lerdo Canal, as shown in Figure 3. An intertie linking the CVC and the Calloway Canal was completed in 2014, which enables water to be conveyed from the CVC to the Calloway Canal and then lifted to the Lerdo Canal at the Calloway Canal-to-Lerdo Canal Intertie. This new route allows the use of the Calloway Canal-to-Lerdo

Canal Intertie 8-1 Pumping Plant, which is more energy efficient. Additionally, from time to time, delivery of water can be accomplished by exchange with North Kern, thereby avoiding the pumping lift entirely. Because the new operational scheme will utilize the portion of the Calloway Canal proposed to be lined, this future use will result in conservation of water beyond the volume that would be conserved under the current mode of operation and would significantly enhance water management and flexibility of operation.

The volume of water conserved from future conveyance of Cawelo Water District's SWP water in the Calloway Canal was estimated by examining historical data for water conveyance along the current delivery route and assuming a similar quantity will be delivered through the "new" delivery route shown in Figure 3. As shown in Table 1-4, the average annual conveyance of Cawelo's SWP water via pump station A from 1976 – 2008 is 24,833 AF. This reflects the average annual delivery that typically occurs over 3.1 months per year. Comparing these monthly operations with Calloway Canal historical monthly operations (Table 1-1) suggests that the Calloway Canal could see an increased operation of around 2.4 months per year or 72 days per year. Therefore, the amount of avoided seepage due to increased water use in the canal would be approximately **1,014 AF/year.** This represents 4.1% of the expected deliveries (1,014 AF water saved along reach / 24,833 acre-feet of increased annual flow).

11 AF/day/mile x 1.28 miles x 72 days/year = **1,014 AF/year**

In total, the proposed Project is estimated to conserve 2,366 AF per year. The actual water savings will be realized after one full season of canal operation. The quantification methodology has been discussed in detail under Subcriterion F2, Performance Measures.

Project Savings = 1,352 AF/year + 1,014 AF/year = **2,366 AF/year**

Consistent with 3.5 miles of previously lined portions of the Canal, construction will include trimming the canal to a trapezoidal prism with a 50-foot-wide bottom, 3-to-1 side slopes, and a nominal depth of 8.5 feet and then lining it with 4-inch thick unreinforced concrete. The performance measures of the previously lined portions did not indicate any seepage post lining the canal. Accordingly, post-project seepage loss has been assumed to be zero.

1.4.2 Evaluation Criterion B – Water Supply Reliability

Will the project address a specific water reliability concern?

The loss of water supply reliability due to regulatory and judicial actions, as well as climate change, was the fundamental regional concern identified in the Poso Creek Integrated Regional Water Management (IRWM) Plan when it was first drafted in 2007. The proposed Project will aid in addressing this concern at a regional level by substantially completing a series of improvements, constructed over several years, which collectively provide another viable route for conveying

imported water into the region. Further, having an additional route provides a level of redundancy in regional water conveyance which did not previously exist.

The San Joaquin Valley portion of Kern County falls into a category of critically stressed groundwater basins. Lining the Calloway Canal and implementing Water Delivery Improvements (as described herein) will allow for more efficient delivery of available surface water supplies to the basin; improve the flexibility of the extensive conjunctive use operations within the region; and reduce groundwater pumping during dry years when the groundwater system is subjected to the greatest stress.

The Kern River is the main source of water to the District and is a significant source of supply to other water agencies in Kern County. Implementation of this Project will help facilitate the long-term goal of the Poso Creek IRWM Group to line the Calloway Canal. Lining the canal will prevent a significant amount of water from being lost to seepage and will provide an ideal conveyance facility to bring more surface water into the valley. This process will reduce dependency on the Kern River by giving the District flexibility to time their diversions from the river.

As mentioned previously, this portion of Kern County is categorized as being in a critically overdrafted basin by the Department of Water Resources. Additionally, this region is perpetually in drought with the last 7 out 10 years classified as dry years. Therefore, the District has prioritized maximizing the use of surface water when available to offset pumping groundwater to meet agricultural demand. As mentioned in section 1.4.1, by lining the canal, the District conserves 2,366 AF/year of surface water that would have otherwise been lost due to seepage. Conserved water (2,366 AF/year) will contribute to meeting existing agricultural demand within NKWSD that is presently being met by pumping groundwater in an area where the water quality of recovered groundwater is not suitable for irrigation without costly treatment. Historical data show the presence of petrochemical discharge present in the groundwater (Figure 4). The presence of phenol makes the groundwater unusable without secondary and tertiary treatment. Any measures which minimize seepage to poor quality groundwater and enable delivery of conserved surface water directly to water users improves the efficiency of water management in the region, reduces demand on the Delta and, supports the environmental objectives of the California Bay-Delta Conservation Plan and the San Joaquin River Restoration Program.

Will the project make water available to achieve multiple benefits or to benefit multiple water users?

In 2016, the City of Bakersfield (City) prepared an Environmental Impact Report[1] (EIR) for a proposed Project with a goal of providing a "restored and more consistent flow of water in the Kern River throughout the Bakersfield city limits", citing benefits which included quality of life, recreation, and aesthetics. The flow management and water supply program specifically focused on flows in the Kern River below the Calloway Weir. In 2019, North Kern cooperated with the

[1] City of Bakersfield Community Development Department, *Notice of Availability of a Recirculated Draft Environmental Impact Report for the Kern River Flow and Municipal Water Program and Public Hearing,* (2016)

City in this regard by diverting some of its Kern River water at the Bellevue weir instead of the Beardsley weir, thereby allowing water to flow in the river through town before being diverted, thus contributing to the City's goal to improve recreation, aesthetics, and quality of life. At the Bellevue weir, the water was diverted into the Cross Valley Canal and then into the Calloway Canal for delivery into North Kern.

Water diverted at the Beardsley weir is delivered to North Kern via the lined Beardsley Canal with negligible losses. Lining the proposed reach of the Calloway Canal will, in combination with previously lined reaches, allow North Kern to continue to cooperate with the City to achieve the stated benefits while also mitigating canal seepage loss that would otherwise be experienced with this alternative conveyance route.

Lining the Calloway Canal will not only help resolve the drought induced water crisis and contribute to quality of life, recreation and aesthetics in the City of Bakersfield, it will also benefit species. By reducing seepage to marginal quality groundwater, reducing pumping demand on higher quality groundwater and helping support groundwater elevations underlying irrigated lands, the proposed Project has the potential to benefit local species. Kern County has more than two dozen threatened and endangered species. As demonstrated by the Kern Water Bank, actions that support local groundwater may assist in restoring wetland and upland habitat via in-lieu groundwater recharge. Species that may benefit include the San Joaquin kit fox (*Vulpes macrotis mutica*); Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*); and San Joaquin wooly threads (*Monolopia congdonii*).

The proposed Project will indirectly benefit federally listed threatened or endangered species by improving the regulation of water supplies that have been rendered less reliable due to the imposition of measures designed to protect threatened and endangered species. These measures include seasonal pumping restrictions in the Sacramento River-San Joaquin River Delta (Delta) and restoration of flows below Friant Dam on the San Joaquin River. The pumping restrictions reduce the amount and constrain the timing of deliveries of SWP and Central Valley Project (CVP) water pumped from the Delta and the deliveries of CVP-Friant Division supplies. The Poso Creek Region, to which North Kern belongs, includes districts with contracts for water from both of these sources. With regard to the San Joaquin River, the relevant species is the federally threatened (spring run)/endangered (winter run) Chinook Salmon.

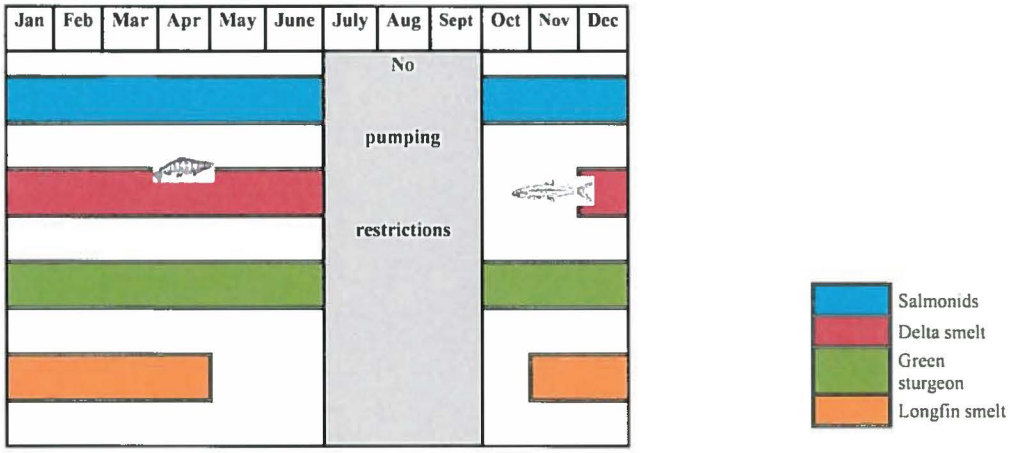
The proposed Project also contributes to the State's co-equal goals, as defined in the Amended Memorandum of Agreement Regarding Collaboration on Planning, Design and Environmental Compliance for the Delta Habitat Conservation and Conveyance Program in Connection with the California Bay Delta Conservation Plan (First Amendment MOA Collaboration BDCP, December 15, 2011). The implementation of co-equal goals is intended to provide reliable water supply for California while protecting, restoring, and enhancing the Delta ecosystem and habitat (SB1, Steinberg- Section 85054). With the completion of the intertie between the Cross Valley Canal and the Calloway Canal, any water diverted from the California Aqueduct for direct delivery to

NKWSD or Cawelo Water District would be conveyed through the reach of the Calloway Canal proposed to be lined under this grant proposal, as well as other previously lined reaches.

With regard to the Delta, relevant species include the following:

- Delta smelt (*Hypomesus transpacificus*) federally threatened;
- Longfin smelt (*Spirinchus thaleichthys*), San Francisco Bay-Delta distinct population segment (DPS), federal candidate;
- Green sturgeon (*Acipenser medirostris*), southern DPS, federally listed threatened;
- Steelhead (*Oncorhynchus mykiss iridium*), California Central Valley DPS, federally threatened;
- Chinook salmon (O. *tshawytscha*), winter-run, federally endangered; and
- Chinook salmon (O. *tshawytscha*), Sacramento River spring-run, federally threatened.

The diagram below, illustrates the pumping restrictions that are currently in force in the Delta in an effort to restore the populations of these fish species.



Will the project benefit a larger initiative to address water reliability?

In 2014, the state of California passed the Sustainable Groundwater Management Act (SGMA), which presented a timeline for realizing sustainable groundwater management. As a member of the Kern Groundwater Sustainability Agency, North Kern has prepared a Groundwater Sustainability Plan (GSP). Funding and completion of the proposed Project has been included in North Kern's GSP as one of several actions that it has determined are necessary to comply with the Sustainable Groundwater Management Act (SGMA). North Kern's GSP, was finalized in January 2020 and is now in review by the California Department of Water Resources (DWR).

With regard to CVP-Friant supplies, the San Joaquin River Restoration Program includes a water management goal. In particular, the goal is to reduce or avoid adverse water supply impacts to the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided by the restoration program. San Joaquin River restoration efforts envision a

program whereby some of the water which was historically diverted into the Friant-Kern Canal will be allowed to flow past Millerton Dam in the San Joaquin River and subsequently diverted into the California Aqueduct and conveyed to and into the Cross Valley Canal for delivery, either directly or indirectly, to Friant Division contractors within Kern County. Diversion of such water from the Cross Valley Canal into the Calloway Canal supports this type of operation and the proposed canal lining improves delivery efficiency.

Because of mismatches in timing between supply and demand, regulation will be necessary to correct these imbalances. The Poso Creek Region includes three CVP-Friant contractors which collectively account for about 25 percent of the Friant Division's Class 1 supply. Two of these entities have already entered into banking arrangements with NKWSD to regulate their contract water supplies and thereby mitigate adverse water supply impacts. Refer to Figure 6 for CVP and SWP water conveyance routes which are involved with the various water banking arrangements. This directly supports the Settlement Agreement through furtherance of the water management goal.

Lining the Calloway Canal will benefit the State of California and Reclamation since it improves delivery efficiency for a regional conveyance route that can be used to help manage recirculation water to meet the San Joaquin River Restoration Water Management Goal.

Will the project benefit rural or economically disadvantaged communities?

The Project will conserve groundwater in a basin that is shared with economically-disadvantaged communities. These communities are represented in the Kern Groundwater Sustainability Agency and in the Poso Creek IRWM Plan.

Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?

NKWSD is part of the Poso Creek Regional Water Management Group, which is comprised of several neighboring water districts in Kern County. The group was established with the primary purpose of developing, through regional collaboration, a long-term plan to improve water supply within the region. The proposed Project was identified in the 2014 Poso Creek IRWM Plan Update as it will allow more efficient delivery of surface supplies to the basin and improve operational flexibility and efficiency within the region. A Letter of Support is included in Appendix A of this application.

The proposed canal-lining component involves the Calloway Canal, which is a water conveyance facility of regional importance. This facility, coupled with other previously completed improvements, provides a viable means for State, Federal, and previously banked water supplies to be delivered directly to NKWSD, Cawelo Water District, and Shafter-Wasco Irrigation District, as well as indirectly to Kern-Tulare Water District and Delano-Earlimart Irrigation District using exchange agreements. Both CEQA and NEPA documents have been completed to allow the districts to bank, exchange, and transfer water supplies over a 25-year period. Lining the Calloway

Canal is integral to improving how water deliveries occur in the region, which is in-line with the Bay Delta Conservation Plan and upcoming SGMA regulations.

1.4.3 Evaluation Criterion C – Implementing Hydropower

The Project does not include a hydropower component; however, the reduction in groundwater pumping due to the avoidance of canal seepage losses by lining a portion of the Calloway Canal, will improve water delivery efficiency and thereby reduce the amount of energy required to pump groundwater (since groundwater is used to make up any deficiencies in surface water deliveries).

1.4.4 Evaluation Criteria D – Complementing On-Farm Irrigation Improvements

Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies

In 2015, NRCS announced the North Kern Water Improvement Project that provides funding through the Bay Delta Initiative for Northern Kern County. The District has a history encouraging direct coordination between the NRCS and growers. The District communicates regarding funding programs with local NRCS staff. As a result, growers within the District have frequently applied to NRCS for funding of on-farm improvements. As of 2020, the District has received summary information from the NRCS indicating that 833 contracts with individual landowners within Kern County have been signed from 2010 to 2020, demonstrating a high level of cooperation between growers, districts in the County, and the NRCS. The 833 contracts equated to roughly $55M being brought into the region. In 2020, the North West Kern Resource Conservation District (NWKRCD) provided assistance to the NRCS to process 171 incoming EQIP applications, of which 41 were funded for a total of $4,217,160.

Although North Kern does not have a capital program to fund on-farm enhancements, the District coordinates with local NRCS staff working directly with growers who have applied to the NRCS for funding of on-farm improvements. Because the names of applicants to NRCS programs remain confidential until funding has been awarded, the District does not have advance knowledge of the number of growers within the District who have requested NRCS funding or of the location of lands where on-farm improvements may be located. The local NRCS staff collaborates with North Kern and local growers with regard to on-farm improvements through the Bakersfield Service Center (USDA, NRCS, Bakersfield Service Center, 5000 California Ave., Bakersfield, CA). NRCS is currently in discussions with North Kern to implement on-farm improvements per the 2016 and 2017 Agricultural Water Use Efficiency (AgWUE) awards.

In addition, North Kern growers have already converted much of the District to low-volume irrigation systems such as drip and micro spray, the District provides some financial support for NRCS on-farm irrigation system evaluations using the Mobile Lab service operated by Brian Hockett of the North West Kern Resources Conservation District (NWKRCD). These evaluations enable growers to improve operation of their existing systems, improvements that both increase the efficiency of their on-farm water management and enhance their management of nutrients such

as nitrogen. North Kern is in the NWKRCD service area and has funded irrigation system evaluations for growers for many years. NRCS funding could enable expansion of this Mobile Lab program.

Furthermore, the District is currently implementing technology to estimate evapotranspiration (ET) throughout its service area. This technology uses a Data Driven Method (DDM) to interpret remote sensing image data and leverage robust ground station data. Ground measurements from monitored Surface Renewal (SR) stations, and TuleTech stations generates hourly ET data, which will be correlated with satellite imagery. The District anticipates that the ET data generated through this process can be used by the growers to improve irrigation scheduling.

Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.

The Calloway Canal is a principal surface water conveyance facility which benefits the entire crop acreage within the District. This Project will serve as an excellent example to the water community of the value of such conservation projects. As part of the regional planning process, NKWSD has presented Project details and benefits to the other members of the Poso Creek Regional Water Management Group who have expressed interest in improving similar regional conveyance facilities that could further leverage the approach taken in this Project for assisting with on-farm improvements.

A primary on-farm benefit is the improved capacity to deliver surface water to irrigated lands that also rely on groundwater pumped from wells drawing from an aquifer immediately underlying the irrigation service area. The Calloway Canal allows for delivery of water directly to NKWSD, Cawelo Water District, and Shafter-Wasco Irrigation District and by exchange to Kern-Tulare Water District, Delano Earlimart Irrigation District and Southern San Joaquin Municipal Utility District. Surface water deliveries to irrigators allow groundwater to be conserved. North Kern practices conjunctive use, as do the neighboring districts, which means surface water, when available, replaces pumping of groundwater to meet irrigation demand. Additionally, with the introduction of SGMA regulations, utilizing every bit of surface water available in-lieu of groundwater is of utmost importance. Many growers within North Kern have purchased surface water rights that are typically available during non-irrigation months when there is no water demand. As a result, the growers store their water in spreading grounds or water banks, some located outside the District. The growers depend on multi-district conveyance infrastructure to bring the water back to their farm. The Calloway canal is perfectly located to return the banked surface water from outside the District to the individual landowners. Therefore, it is critical to line the Calloway canal to ensure maximum efficiency while returning the banked water to the landowners. If more surface water is available, less groundwater is pumped, resulting in less energy for the same total water use. As explained previously, the potential benefits of the Project due to reduced reliance on groundwater are directly associated with the 2,366 acre-feet of reduced seepage that will result from canal lining.

Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.

The NRCS Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that provides financial and technical assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land. Growers apply directly to the NRCS for EQIP funding, and, since the applicants to the NRCS programs remain confidential until awarded funding, North Kern is generally not aware of the number of growers in the District who have applied for funding until the funding has been awarded. Nevertheless, the District strongly supports grower participation in EQIP as improved on-farm water use efficiency is the cornerstone for improved District and regional water management.

Expanded NRCS funding would benefit both growers and the District by 1) conserving water on irrigated cropland, and 2) reducing leaching of nutrients to groundwater by controlling deep percolation and improving nutrient management. The NWKRCD provides the water conservation field services necessary to attain these objectives through their on-farm irrigation system performance testing.

The service area boundaries are the same as the District's boundaries, as shows in Figured 1 and 2.

1.4.5 Evaluation Criterion E – Department of the Interior and Bureau of Reclamation Priorities

Utilization of Natural Resources

Water is one of the greatest natural resources. In the western United States, water is a critical resource and extensive planning efforts are required to fully utilize available supplies to meet beneficial uses. California's water supply is interconnected throughout the state. Better management practices and conservation of supplies, two benefits of the proposed Project, provide benefits to all that rely on the shared supply.

Restoring Trust with Local Communities

Agriculture is a key component of the economy of the San Joaquin Valley. As California's population has grown, the water supply within the state has become stressed. The stress on the water supply positions communities' needs and interests for use of water in competition with the needs and interest of agriculture. Lining the Calloway Canal will provide additional surface supplies to be delivered to the farmer which will relieve tension with municipal services and domestic communities (six within the District). This promotes regional cooperation among the District and its neighbors and will allow for effective implementation of groundwater conservation and management practices.

Modernizing our Infrastructure

Much of NKWSD's water infrastructure is several decades old. The Calloway Canal was initially used only during wet periods to deliver high flows to spreading grounds as an unlined, earthen canal. A lined canal is a regional improvement resulting in a more efficient and flexible (timing) means of delivery of water supplies in dry, normal and wet hydrologic years. Further, the District's wells were never augmented with telemetry systems. The use of local, private contractors to implement both components of the proposed Project supports Reclamations priority of "prioritizing Department infrastructure to highlight cyclical and deferred maintenance".

1.4.6 Evaluation Criterion F – Implementation and Results

1.4.6.1 Subcriterion F.1 – Project Planning

In July 2007, by Resolution of its governing Board of Directors, NKWSD adopted the Poso Creek IRWM Plan and the Plan Update in 2014. This plan was developed over a period of years in collaboration with neighboring districts and the Poso Creek Regional Water Management Group in accordance with guidelines published by the State of California. Subsequently, a Reclamation-funded System Optimization Review (SOR) was conducted for this group[2]. Copies of the documents discussed below are available upon request.

Integrated Regional Water Management Plan

The Plan's Executive Summary identifies the following as the first strategy to be employed to mitigate projected reductions in the Region's surface water supplies:

> "Maximize use of available surface water supplies through the use of existing absorptive capability by coordinating mismatches between supply and demand within the Region, i.e., matching supply that exceeds demand in one district with demand that exceeds supply in another district. This applies to both irrigation absorptive capability as well as spreading absorptive capability."

By expanding the flexibility of water management options available in the region, limiting seepage to impaired groundwater, and reducing groundwater pumping volumes and lifts, the proposed Project is entirely consistent with, and in furtherance of, this strategy.

System Optimization Review (SOR)

The focus of the SOR was to prioritize the implementation of structural water management measures for the region based on their expected benefits to the region's water supply reliability, and to identify and resolve institutional constraints to exchange water between districts and

[2] Semitropic Water Storage District acted as lead agency on the grant from Reclamation to help fund this work.

enhance the use of District groundwater banking facilities that will help mitigate the projected loss of water reliability to the region. The study is complete, and a memorandum was prepared in March 2010 regarding the Plan of Action resulting from the SOR. A Final Report was submitted to Reclamation in early 2011. The Plan of Action identified lining of the Calloway Canal as one of the structural measures required to optimize management of water supplies to the region.

Drought Contingency Plan (DCP)

The purpose of the DCP is to focus on drought mitigation and planning to increase resiliency to drought conditions. In addition, planning procedures include developing operational and administrative framework to more efficiently implement drought emergency response actions. Accordingly, North Kern has drafted a district-specific preliminary drought contingency plan that will be included in the Poso IRWM Group Regional Drought Contingency Plan which is currently in development. NKWSD DCP addresses the main elements of drought planning including: drought monitoring; assessment of vulnerabilities; mitigation actions for long-term resiliency of drought; response actions; the operational and administrative framework for addressing monitoring, projects, and actions; and the drought plan update process. Mitigation actions in the plan are projects which will be developed for long-term resiliency to drought. Lining the Calloway canal has been identified in the District's DCP as a top priority to achieve drought resiliency.

1.4.6.2 Subcriterion F.2 – Performance Measures

Following completion of the Project, measurements will be taken at Buck Owens and Olive Drive Weirs to estimate the volumetric loss of water. In addition, occasional stream gage measurements will be taken at locations between the Buck Owens Weir and Olive Drive weirs. These locations include segments of the Calloway Canal that were recently lined.

Historically, flow has been measured at various locations along the Calloway Canal and the resulting flow volumes have been recorded and reported in annual Kern River Hydrographic Reports. The reports used in this analysis cover the 21-year period from 1990 through 2010. These data demonstrate that the Canal has been used historically only in "wet" years, which is due in part to the high seepage loss rates. To evaluate the average annual seepage losses, two different flow measurement locations along the Canal were compared; specifically, the Buck Owens Weir (previously named Standard Weir) and the Olive Drive Weir (previously named Laborde Weir). These are sharp-crested weirs equipped with stage recorders and the discharge ratings are periodically checked with stream gaging methods. Taking into account all deliveries and inflows, the difference in flow volume between these two points is the amount of canal seepage (excepting a relatively small amount attributable to evaporation).

As summarized in Table 1-1, seepage loss at Buck Owens Weir, the 6 mile reach between the Buck Owens and the Olive Drive weirs, lost an average of 6,975 acre-feet per year over the 21-year period. Figure 3 shows the locations of the measuring points. Excluding the non-flow years and non-flow months, the average annual losses are about 12,200 acre-feet (AF) and the average monthly losses are about 1,017 AF (12,200 AFY/ 12 Mo). These numbers are higher and more

closely reflect losses when water is flowing. However, during some of the months, the Canal was only operated for part of the month; therefore, averages are not truly reflective of daily losses. Considering only the summer months, when the Canal typically operated for the entire month [66 months over the study period, (Table 1-3), the average loss is 1,994 AF or 322 AF per mile. Based on a 30-day month, the implied average loss per day per mile is 11 AF per day per mile].

As mentioned previously, the completion of this Project will enable the District to direct 24,833 AF of SWP water in addition to the current conveyance of 31,458 AF of Kern River water. With an annual savings of 2,366 AF, this Project increases the efficiency of the canal by 4.2%.

This data should be sufficient enough to measure Project Performance.

1.4.6.3 Subcriterion F.3 – Readiness to Proceed Schedule

The proposed work is limited to construction. Construction includes preparing, modifying, re-shaping, and lining the canal, including subgrade preparation; relocation of fill dirt; placement, compaction and grading of fill; and other necessary components as defined in the specifications that will be developed during the design phase. The contract will be to "furnish and install" the Project, thus the contractor will be responsible for all equipment and permitting costs.

Permits

All necessary permits will be evaluated and filed prior to beginning construction. Apart from permits necessary as part of the CEQA and NEPA documentation, permits, including the NPDES SWPPP and PM-10 permits as well as any others that may be necessary to be compliant with all regulations, will be the responsibility of the awarded contractor.

The District will adhere to applicable laws, regulations, and codes and will ensure required approvals and permits are obtained. It is anticipated that some permits will be required. The awarded contractor will be responsible for obtaining all necessary permits and approvals. The Project is located exclusively within maintained rights-of-way owned and operated by North Kern. As such, it is expected that requirements for permits and approvals will be minimal. The following potential permits and approvals will be addressed.

The construction specifications will include language relating to obtaining permits and approvals prior to construction. In particular, the standard language in the specifications state "The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits and licenses therefore…". Such permits and approvals may include, preparing and implementing a Stormwater Pollution Prevention Plan pursuant to the National Pollution Discharge Elimination System (Clean Water Act Section 402) and obtaining a Construction Notification and Dust Control Plan to the San Joaquin Valley Air Pollution Control District. Additionally, a pre-construction survey for special-status species will be conducted by a qualified biologist immediately prior the start of construction.

Pursuant to Section 17.28.040(B)(5) of the Kern County Code of Ordinances, the District is exempt from obtaining a grading permit. Likewise, pursuant to Section 17.66.020(C)(7) of the City of Bakersfield Municipal Code, the District is exempt from obtaining a grading permit. Accordingly, the District will not seek a County or City grading permit.

Engineering and Design Work

Engineering design drawings have been prepared for segments of the Calloway Canal that have received funding in previous years, including final design drawings and contract documents prepared for bidding. The previously prepared design and bid documents have canal sections of the similar dimensions. If funded, North Kern will complete the design for the proposed area based on the designs that have already been completed.

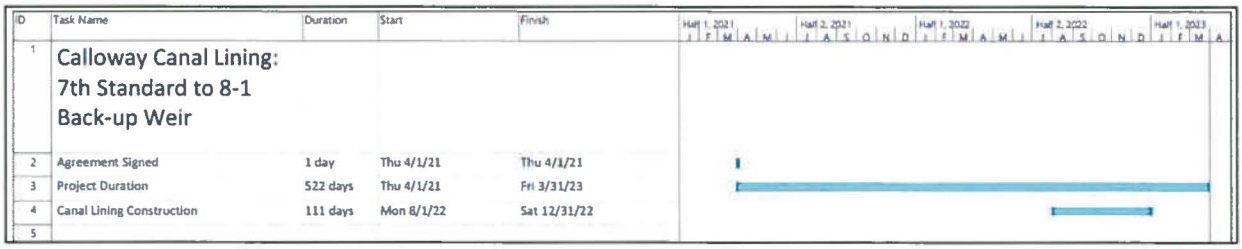
Once the environmental documentation and design work is complete, the District will go out to bid for the construction phase of the Project. All necessary permits will be obtained prior to beginning of construction activities. The District plans to begin the necessary environmental documentation on April 1st, 2021 (post award date) and expects to complete construction by December 2022, with estimated completion of all construction management and reporting activities by March 2023.

The District has previously prepared EA-17-23-MP in consultation with the Reclamation for a previously lined canal section. The District anticipates working closely with Reclamation to prepare the environmental compliance document required to implement the proposed Project. Sections 3 discusses environmental compliance in more detail.

Schedule

A schedule is included below. Because the proposed work is limited to construction, the detailed task in the schedule is limited to construction. However, the overall project duration has been included. Assuming funding is awarded, and an agreement is signed by April 1, 2021, the schedule includes an agreement start date of April 1, 2021. Contract documents will be provided by early 2022 for bidding purposes. Construction is estimated to begin in August 2022 and to be completed by December 2022. All Project work and a Final Project Report will be delivered by March 2023. The Project is not expected to deviate from Reclamation's proposed start date of April 1, 2021 and completion is anticipated well within the 36-month grant duration. Upon receipt of a signed agreement, the first step would be completion of CEQA and NEPA compliance requirements for the Project area.

Figure 5. Schedule



ID	Task Name	Duration	Start	Finish
1	Calloway Canal Lining: 7th Standard to 8-1 Back-up Weir			
2	Agreement Signed	1 day	Thu 4/1/21	Thu 4/1/21
3	Project Duration	522 days	Thu 4/1/21	Fri 3/31/23
4	Canal Lining Construction	111 days	Mon 8/1/22	Sat 12/31/22
5				

1.4.7 Evaluation Criterion G – Nexus to Reclamation Project Activities

Is the proposed project connected to Reclamation project activities? If so, how?

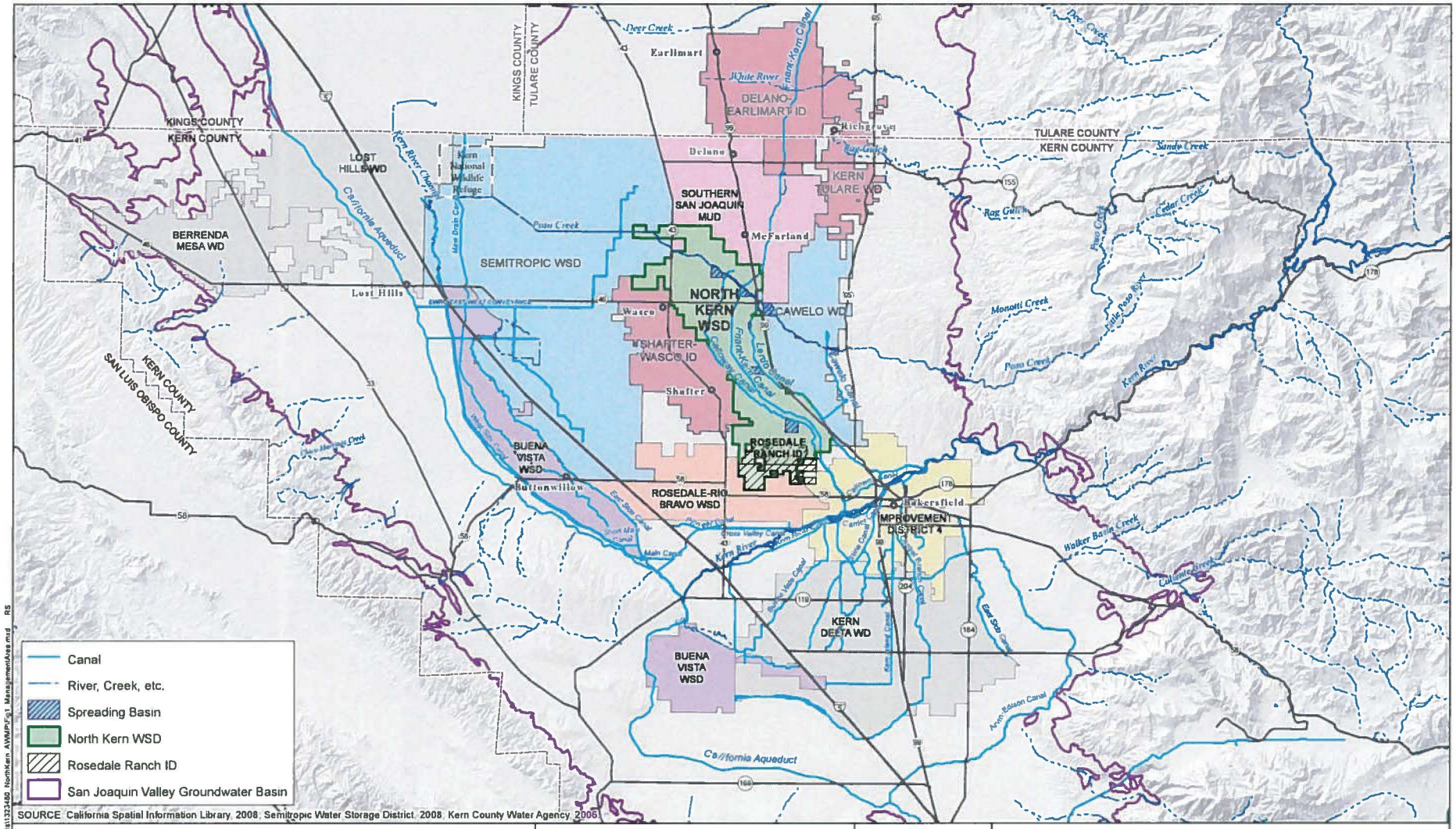
Although NKWSD is not a Federal water contractor, they have already entered into water banking deals with Federal water contractor neighbors such as Shafter-Wasco Irrigation District, Delano-Earlimart Irrigation District, Southern San Joaquin Municipal Utility District, and Kern-Tulare Water District. Reclamation's Friant-Kern Canal (FKC) flows through the District, which enables the District to bank water from the FKC on behalf of Kern-Tulare Water District and Delano-Earlimart Irrigation District during wet years, principally through use of North Kern's extensive spreading grounds. Figure 6 indicates the flow path of the FKC, and the spreading grounds located in the District, to effectively bank Reclamation's water on behalf of the Federal contractors. In another instance, Shafter-Wasco Irrigation District exchanges Reclamation's water with NKWSD by diverting water into their district from the more conveniently located Calloway Canal. North Kern effectively utilizes its absorptive capacity to bank excess water during wet years for its federal contractor neighbors and returns water to them during the dry years using canals such as the Calloway Canal. Additionally, as discussed previously, the Calloway Canal provides an alternate conveyance route (Figure 6) for CVP supplies that maybe restricted by restrictions in the FKC. This enables operational flexibility for all these districts by allowing effective utilization of their surface water sources when available and promotes regional cooperation towards making this basin self-sufficient.

Will the project benefit any tribe(s)?

The proposed Project is located in the Tulare Lake Basin, which also includes Reclamation's Friant-Kern Canal. The Project lands do not involve any Reclamation facility nor does the Project provide benefit to tribes.

1.4.8 Evaluation Criterion H – Additional Non-Federal Funding

$$\frac{\text{Non-Federal Funding}}{\text{Total Project Cost}} = \frac{\$\ 2{,}471{,}272.00}{\$\ 4{,}471{,}272.00} = 55\%$$



SOURCE: California Spatial Information Library, 2008; Semitropic Water Storage District, 2008; Kern County Water Agency, 2006

10 5 0 10
Miles

North Kern Water Storage District
Kern County, California

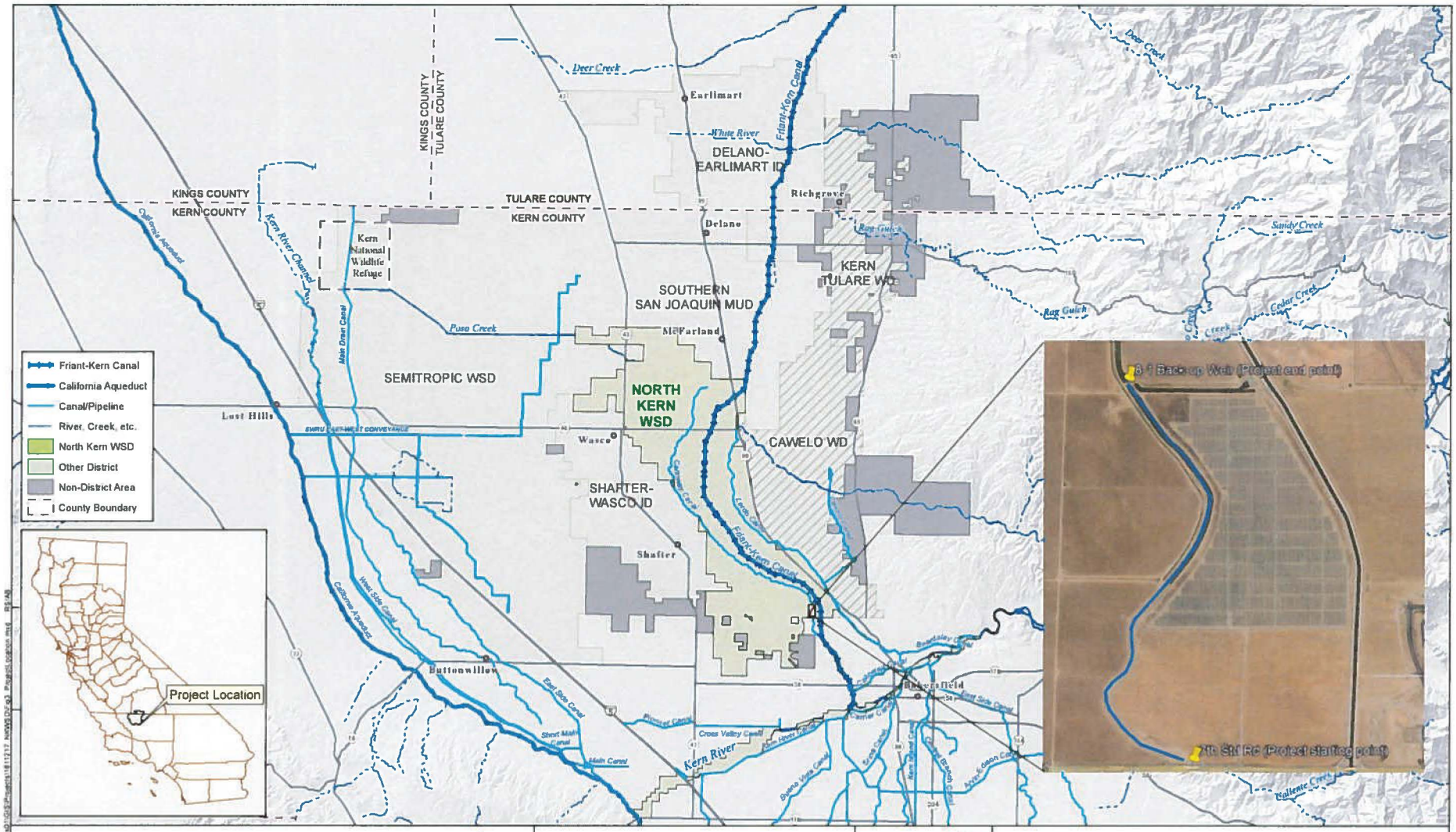
GEI Consultants

Location of District

SEPTEMBER 2020

FIGURE 1

01-Oct-2019 Z:\Projects\1323480_NorthKern_AWMP\Fig1_ManagementArea.mxd RS


KINGS COUNTY
KERN COUNTY
TULARE COUNTY
KERN COUNTY
KINGS COUNTY
TULARE COUNTY
Deer Creek
Earlimart
White River
Friant-Kern Canal
DELANO-
EARLIMART ID
Richgrove
Delano
Rag Gulch
Sandy Creek
Cedar Creek
California Aqueduct
Kern River Channel
Kern
National
Wildlife
Refuge
Main Drain Canal
Poso Creek
SOUTHERN
SAN JOAQUIN MUD
KERN
TULARE WD
McFarland
SEMITROPIC WSD
NORTH
KERN
WSD
Lost Hills
Wasco
CAWELO WD
SHAFTER-
WASCO ID
Shafter
Cross Valley Canal
Kern River
Buttonwillow
West Side Canal
East Side Canal
Main Canal
Bakersfield
Friant-Kern Canal
Friant-Kern Canal
Project Location
Miles
10
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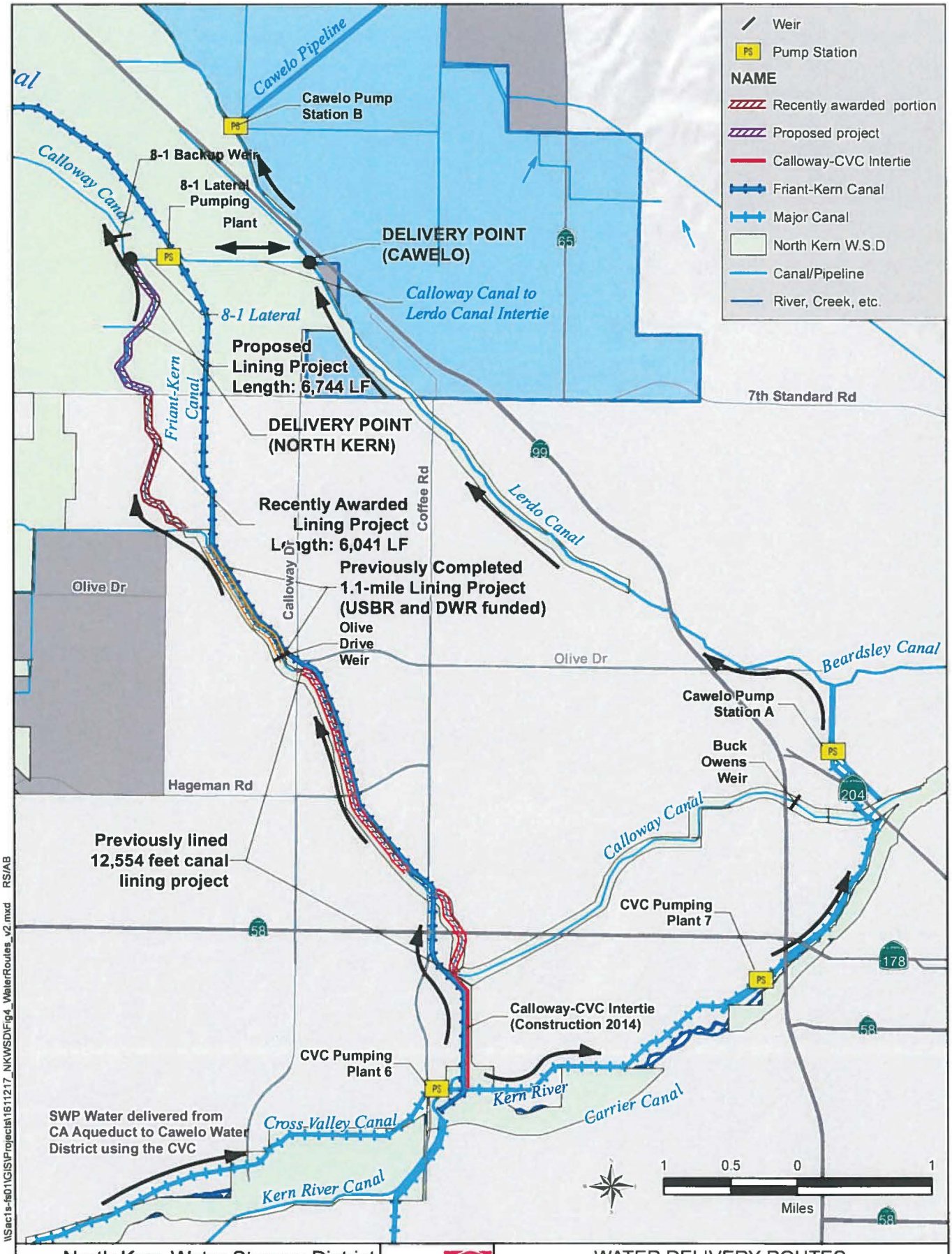
North Kern Water Storage District
Kern County, California
GEI
Consultants
PROJECT LOCATION - CANAL LINING
SEPTEMBER 2020
FIGURE 2



26-Aug-2019 \\Sac1s-fs01\GIS\Projects\1611217_NKWSD\Fig4_WaterRoutes_v2.mxd RS/AB

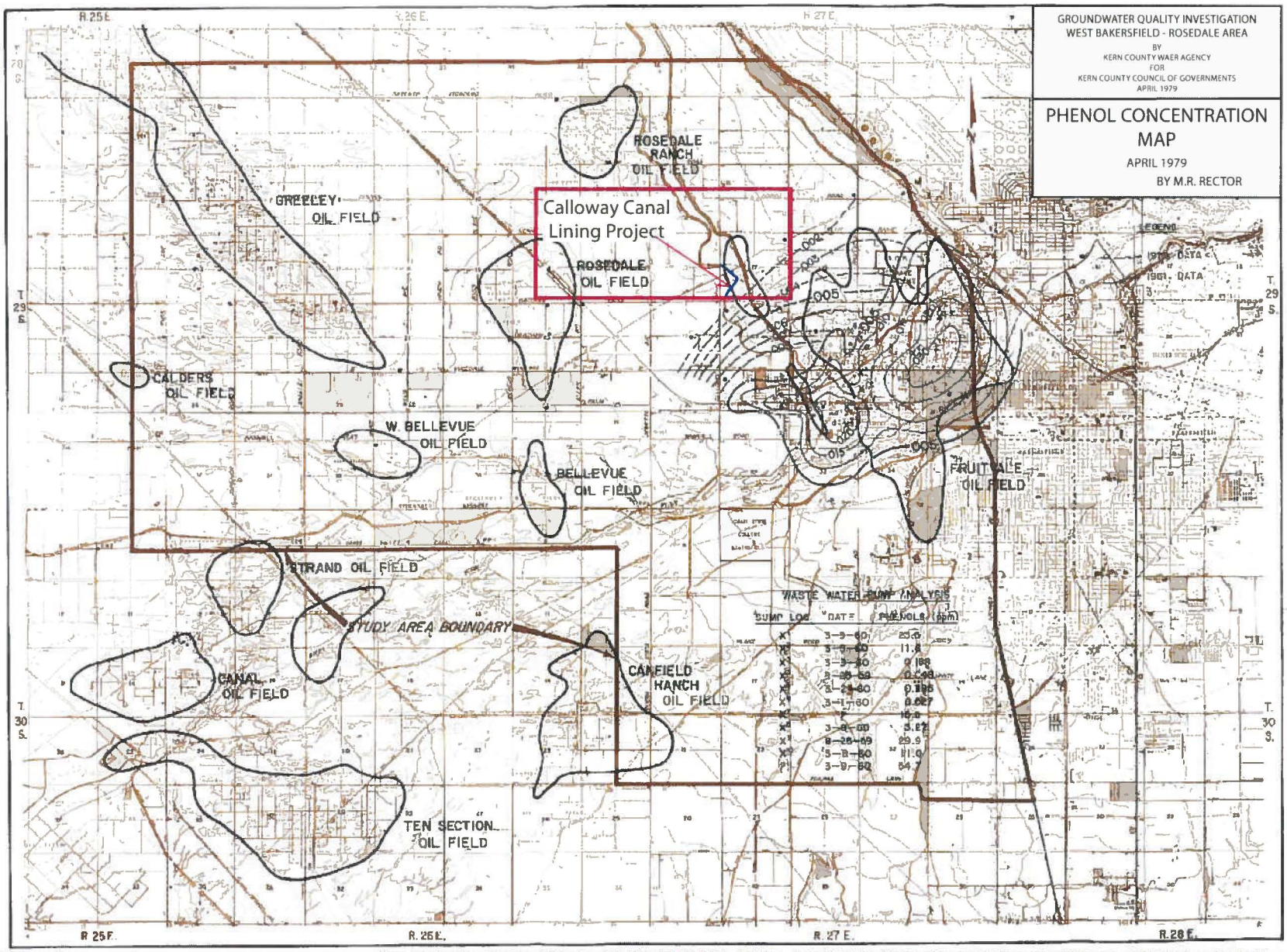
North Kern Water Storage District
Kern County, California

GEI Consultants

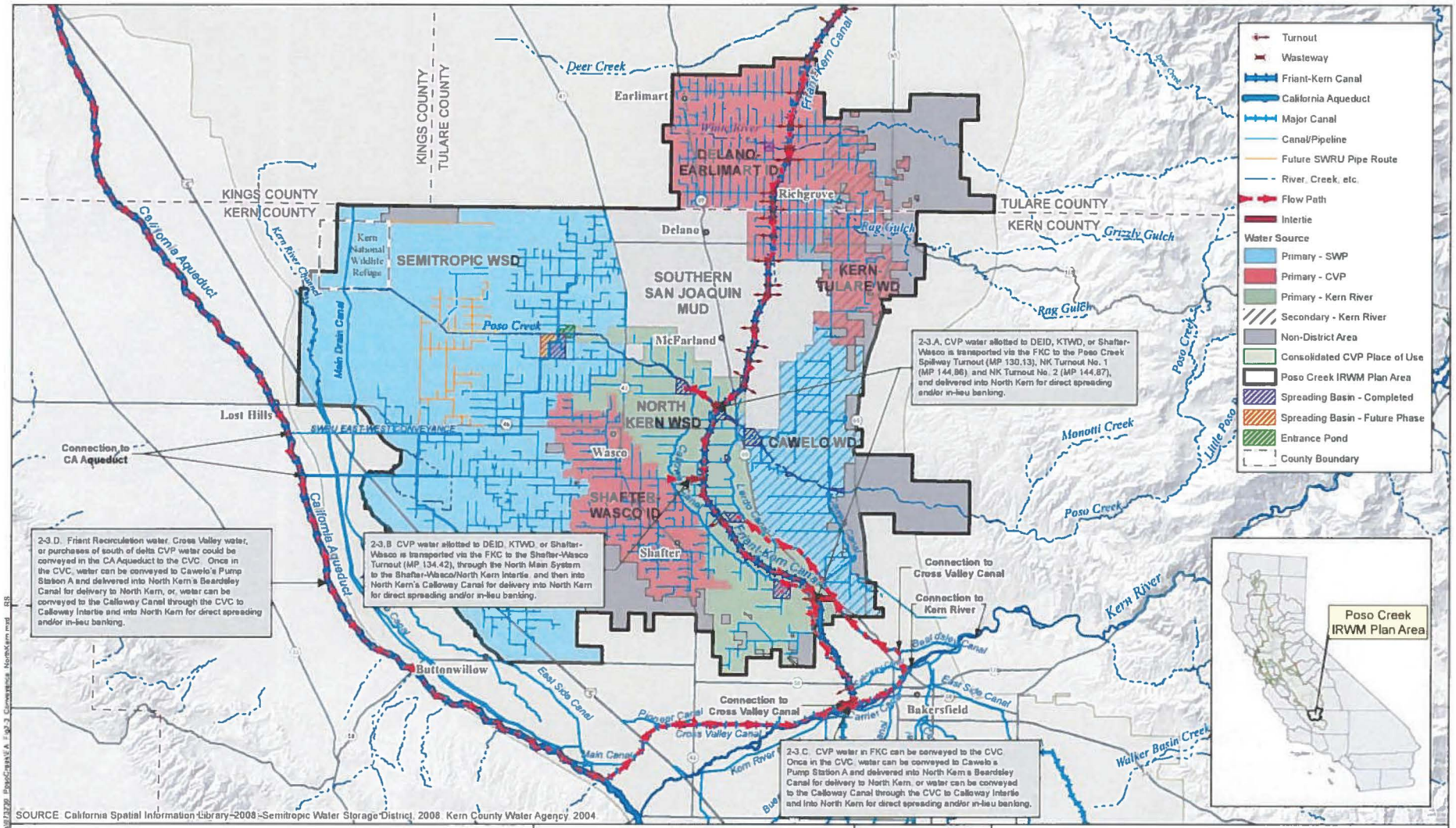
WATER DELIVERY ROUTES TO NORTH KERN WSD

SEPTEMBER 2020

FIGURE 3



North Kern Water Storage District	GEI Consultants Bookman Edmonston Division	Phenol Concentration Map
Kern County, California	SEPTMEBER 2020	Figure 4



North Kern Water Storage District
Kern County, California

GEI Consultants
Bookman-Edmonston Division

CONVEYANCE OF WATER FROM POSO CREEK IRWM GROUP CVP CONTRACTORS TO NORTH KERN FOR GROUNDWATER STORAGE

SEPTEMBER 2020

FIGURE 6

Table 1-1

Calloway Canal Flow at Buck Owens Weir

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,737	3,314	4,395	13,793	15,872	4,149	859	3,175	1,857	-	50,151
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	4,587	5,088	10,227	18,621	19,900	20,604	17,669	10,975	10,468	10,143	1,674	131,612
1996	1,370	1,638	766	792	12,948	11,700	12,355	7,857	1,222	1,065	-	-	51,713
1997	7,842	10,145	13,866	5,829	9,677	12,474	12,058	7,090	1,004	-	-	-	79,985
1998	5,461	5,011	5,827	5,940	8,279	18,434	22,526	20,013	10,584	1,764	-	-	103,839
1999	6,651	4,533	63	541	3,511	5,342	6,044	4,810	2,839	3,820	371	-	38,525
2000	-	476	1,081	-	-	-	-	-	-	168	20	4	1,749
2001	-	-	16	-	-	-	-	-	-	-	-	2,184	2,200
2002	1,486	-	-	-	-	-	-	-	-	-	36	44	1,566
2003	-	-	-	-	-	-	-	-	-	-	-	-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005	18	2,440	1,341	264	1,457	18,488	19,241	4,201	-	1,087	522	10,038	59,097
2006	12,113	-	559	1,656	22,387	29,151	26,337	5,687	327	-	-	-	98,217
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-	4	454	12,174	10,488	14,104	-	-	-	-	4,744	41,968
Total	36,597	28,830	31,348	29,017	93,449	139,770	149,141	71,476	27,810	21,547	12,949	18,688	660,622
Average	1,743	1,373	1,493	1,382	4,450	6,656	7,102	3,404	1,324	1,026	617	890	31,458
Non-Zero Average	4,575	4,119	2,850	3,224	10,383	15,530	16,571	8,935	3,973	3,078	2,158	3,115	55,052

Source: Annual Hydrographic Reports for Kern River.

Table 1-2

Seepage Losses between Buck Owens and Olive Drive Weirs

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,238	1,496	878	1,153	1,492	1,431	573	1,211	972	-	11,444
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	2,905	1,889	1,645	1,940	1,722	1,828	1,676	1,613	1,658	1,507	688	20,727
1996	926	678	587	710	2,021	1,560	1,598	1,710	778	1,305	-	-	11,873
1997	1,416	1,138	1,271	1,291	1,287	1,226	996	1,210	743	95	65	-	10,738
1998	1,862	1,244	1,269	986	1,287	1,601	1,271	1,037	1,214	914	560	-	13,245
1999	1,484	1,276	63	541	1,149	1,752	1,496	1,037	1,149	1,593	194	-	11,734
2000	-	476	1,081	-	-	-	-	-	-	168	20	4	1,749
2001	-	-	16	-	-	-	-	-	-	-	-	2,166	2,182
2002	1,363	-	-	-	-	-	-	-	-	-	36	44	1,443
2003	-	-	-	-	-	-	-	-	-	-	-	-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005	18	2,440	1,341	264	1,457	8,297	2,378	1,466	-	1,087	522	3,152	22,422
2006	2,152	-	559	1,656	3,979	3,675	3,423	2,747	327	-	-	-	18,518
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-	4	454	7,611	4,913	5,045	-	-	-	-	2,376	20,403
Total	10,877	10,157	10,318	9,043	21,609	25,899	19,527	12,314	6,397	8,031	3,876	8,430	146,478
Average	518	484	491	431	1,029	1,233	930	586	305	382	185	401	6,975
Non-Zero Average	1,360	1,451	938	1,005	2,401	2,878	2,170	1,539	914	1,004	485	1,405	12,207
Maximum	2,152	2,905	2,238	1,656	7,611	8,297	5,045	2,747	1,613	1,658	1,507	3,152	22,422

Source: Annual Hydrographic Reports for Kern River.

6,975 AF lost over 6.2 miles
equals 11 AF/day/mile

Table 1-3

Seepage Loss between Buck Owens and Olive Drive Weirs (Full Flow Months)

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,238	1,496	-	1,153	1,492	1,431		1,211		-	9,021
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	2,905	1,889	1,645	1,940	1,722	1,828	1,676	1,613	1,658	1,507		20,039
1996	-	-	-	-	2,021	1,560	1,598	1,710		1,305	-	-	8,194
1997	1,416	1,138	1,271	1,291	1,287	1,226		1,210				-	8,839
1998	1,862	1,244	1,269	-	1,287	1,601	1,271	1,037	1,214			-	10,785
1999	1,484	1,276	-		1,149	1,752	1,496	1,037	1,149	1,593		-	10,936
2000	-	-	1,081	-	-	-	-	-	-				1,081
2001	-	-		-	-	-	-	-	-	-	-	2,166	2,166
2002	1,363	-	-	-	-	-	-	-	-	-			1,363
2003	-	-	-	-	-	-	-	-	-	-		-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005		2,440	1,341		1,457	8,297	2,378	1,466	-	1,087		3,152	21,618
2006	2,152	-		1,656	3,979	3,675	3,423	2,747		-	-	-	17,632
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-			7,611	4,913	5,045	-	-	-	-	2,376	19,945
Total	9,933	9,003	9,089	6,088	20,731	25,899	18,531	12,314	3,976	6,854	1,507	7,694	131,619

Source: Modified from Table 1

Total Months = 66
131,619 AF/ 66 Mo. = 1,994 AF/Month

66 full-flow months in 21 years =
3.14 months/year

Table 1-4

Cross Valley Canal to Beardsley Canal though Cawelo Pump Station A
(values in acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1976	0	657	1,567	2,452	3,951	6,925	8,867	7,030	1,643	0	629	1,914	35,635
1977	0	279	412	0	0	446	1,099	1,978	813	424	99	0	5,550
1978	0	0	67	0	0	0	248	4,759	1,627	0	0	0	6,701
1979	0	0	0	0	0	0	0	0	1,162	6,129	3,477	3,404	14,172
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	476	248	0	1,279	4,760	8,360	9,047	9,376	7,740	4,433	926	0	46,645
1982	0	56	1,406	0	0	0	0	0	0	0	0	0	1,462
1983	0	0	0	4	0	0	0	0	0	0	0	0	4
1984	10	0	0	0	0	0	0	0	0	0	0	0	10
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	12	4,117	5,015	3,818	4,348	5,090	0	0	0	0	0	0	22,400
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	607	1,572	30	0	2,209
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	6	0	0	0	0	0	0	0	0	0	0	0	6
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	1,549	6,006	9,445	9,362	8,957	8,253	8,053	9,574	3,400	0	64,599
2000	0	0	0	1,573	4,963	4,770	5,086	4,393	1,254	0	0	0	22,038
2001	0	0	0	0	0	1,250	924	454	2,277	0	0	0	4,905
2002	0	1,755	167	151	329	8,295	9,221	9,838	6,795	8,160	40	0	44,751
2003	0	0	772	107	0	1,603	0	0	0	0	627	0	3,108
2004	0	2,424	4,534	0	0	5,554	6,311	2,763	0	0	0	0	21,586
2005	472	1,531	5,950	9,199	0	0	0	0	0	0	0	0	17,152
2006	0	3,117	8,888	2,473	0	0	4,421	9,025	5,147	9,423	9,537	6,821	58,852
2007	1,615	0	0	0	4,381	4,092	1,099	151	0	0	0	0	11,338
2008	0	0	0	0	0	0	0	0	0	0	0	0	0
1976-2008	79	430	919	820	975	1,689	1,675	1,758	1,125	1,203	569	368	11,610
max. af	1,615	4,117	8,888	9,199	9,445	9,362	9,221	9,838	8,053	9,574	9,537	6,821	64,599
max. cfs	27	68	147	152	156	155	152	163	133	158	158	113	1,068
1998-2007	209	883	2,186	1,951	1,912	3,492	3,602	3,488	2,353	2,716	1,360	682	24,833

SWP project water historically brought in by Cawelo W.D, which can now be conveyed to Cawelo W.D via the Calloway Canal in an energy efficient way

2. Project Budget

2.1 Funding Plan and Letters of Commitment

The District will designate monetary funds from their construction capital account, a District revenue account, for the Non-Federal Share of this Project. As needed, the District has sold bonds to fund projects. At this time, it is not anticipated that there will be any funding provided by anyone other than the applicant, aside from the requested Federal Share. The Budget Proposal does not include any costs that have been incurred prior to the award.

2.2 Budget Proposal

The proposed work is limited to construction, thus the Budget Proposal and Budget Narrative have been limited to construction. The Project cost is estimated to be $4,471,272. As shown in Table 2-1, the requested Federal Funding is $2,000,000. A budget summary is included as Table 2-2 and a detailed construction contract budget, including unit cost and quantity, is included as Table 2-3.

Table 2-1. Total Project Cost

Source	Amount
Cost to be reimbursed with the requested Federal Funding	$ 2,000,000.00
Costs to be paid by the applicant	$ 2,471,272.00
Value of third-party contributions	$ 0.00
Total Project Cost	**$ 4,471,272.00**

Table 2-2. Budget Summary

BUDGET ITEM DESCRIPTION	TOTAL COST
SALARIES/WAGES	**$0**
	$0
FRINGE BENEFITS	**$0**
	$0
TRAVEL	**$0**
	$0
EQUIPMENT	**$0**
	$0
MATERIALS AND SUPPLIES	**$0**
	$0
CONTRACTUAL	**$4,471,272**
Canal Lining	$4,471,272
THIRD-PARTY IN-KIND CONTRIBUTIONS	**$0**
	$0
ENVIRONMENTAL AND REGULATORY COMPLIANCE COSTS	**$0**
	$0
OTHER	**$0**
	$0
TOTAL DIRECT COSTS	**$4,471,272**
INDIRECT COSTS	
None	$0
TOTAL ESTIMATED PROJECT COST	**$4,471,272**

Table 2-3. Contractual Budget

CONSTRUCTION CONTRACT	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
Item				
Canal Lining Construction	$663.00	6744	LF	$4,471,272
TOTAL ESTIMATED COST				**$4,471,272**

2.3 Budget Narrative

Given the requested Federal funding is $2,000,000, the remaining $2,471,272 of construction costs satisfies and exceeds the required fifty percent Non-Federal funding share. Therefore, engineering and other tasks are not included in the Project work or in the Budget Proposal for this application. Contractual costs for construction of the Project are the only costs included in the Budget Proposal and are therefore the only costs discussed below. The District understands that costs incurred by Reclamation for environmental compliance and review will be added as a line item to the budget and will be withheld from the Federal award amount.

Contractual

The District anticipates awarding a single contract for all elements of the Project construction including preparing, modifying, re-shaping, and lining approximately 6,744 LF of existing canal, including subgrade preparation; relocation of fill dirt; placement, compaction and grading of fill; and other necessary components as defined in the specifications that will be developed during the design phase. The contract will be to "furnish and install" the Project, thus the contractor will be responsible for all equipment and permitting costs.

The District will advertise that it is accepting sealed proposals for the construction contract for the Project. A contract will be awarded to the lowest responsible bidder, assuming the proposal is in line with the District's cost estimate and/or is approved by the District's Board of Directors.

The estimated cost is based on the District's experience with recent canal lining projects, specifically construction contract NK 611, which was completed in December 2018. The contract earnings for NK 611 totaled $3,434,618 for construction of 5,553 LF of canal lining. Based on the total contract and scope, the cost per LF of canal lining was $618 for NK 611. Construction of NK 611 occurred in 2018. Applying a 4% escalation factor results in a unit cost in 2020 of $663 per LF. The escalation factor was determined by RS Mean's Historical Cost Index, included as Appendix B.

3. Environmental and Cultural Resources Compliance

In February 2006, North Kern completed an Initial Study (IS) for the 2006 System Operations Improvement Project, which included lining over a six-mile portion of the Calloway Canal. In January 2007, based on the IS, North Kern adopted a Negative Declaration for the 2006 System Operations Improvement Project. Therefore, California Environmental Quality Act (CEQA) requirements will be met for the proposed Project.

For lining of the Calloway Canal, Reclamation completed four Environmental Assessments (EAs), including the *Cawelo Water District Calloway Canal Lining Project – Reach A* (12-08-MP in December 2012), *Cawelo Water District Calloway Canal Lining Project – Reach B* (EA-14-02-MP in July 2014), *Cawelo Water District and North Kern Water Storage District Calloway Canal Lining Project – Reaches C1, C2, and D* (EA-15-01-MP in March 2015), *North Kern Water Storage District Calloway Canal Lining and Water Delivery Improvements* (EA-17-23-MP in October 2017). Reclamation has stated that they will prepare a combined Categorical Exclusion Checklist (CEC) for the *Calloway Canal Lining (North of Snow Road) and Water Delivery Improvements* and *Calloway Canal Lining (North of Snow Road 2200 LF to 6041 LF*; the CEC is expected to be completed in early 2021. It is assumed that Reclamation will prepare a CEC for the proposed Project.

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The extent (footprint) of the proposed Project is relatively small and is located exclusively within maintained rights-of-way owned and operated by North Kern. These rights-of-way are surrounded agricultural fields and a large solar facility.

For the canal lining, earth-disturbing activities would include trimming the canal to conform to the lined prism (i.e., trapezoidal profile), which is not an extensive movement of quantities of material. All work on the site is subject to the requirements of an approved dust control plan as part of the San Joaquin Valley Air Pollution Control District's Rule 8021. The District will engage a qualified biologist to conduct a pre-construction survey shortly before the start of construction to ensure that the construction area remains unoccupied by sensitive (endangered) species. In addition, standard avoidance and minimization protocols will be included in the Project specifications and will be followed during construction. Moreover, the duration of the construction activity is expected be relatively short (i.e., construction to occur over period of few months within the two-year window for utilizing the grant funds).

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would these be affected by any activities associated with the proposed project?

As part of the NEPA process, Reclamation will prepare a Biological Assessment and complete consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA). Several federally listed wildlife and plant species, such as San Joaquin kit fox, kangaroo rat, blunt-nosed leopard lizard, Kern mallow, and San Joaquin woolly-threads, are known to occur in Kern County; however, it is anticipated that these federally listed species would not be affected by the proposed Project with the incorporation of avoidance and minimization measures. Finally, designated critical habitat is not located within or near the proposed Project area.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.

There are no wetlands or other surface waters inside the Project boundaries that fall under CWA jurisdiction as "waters of the United States".

When was the water delivery system constructed?

North Kern's canal and pipeline distribution system and related works were originally completed in the 1950s, with additional features and enlargements (e.g., pumping stations, discharge pipelines, and reservoir systems) constructed with the expansion of the District's service area (i.e., increased water demand). Kern County Land and Water Company, who subsequently lengthened it to its current 30-mile length, originally constructed the Calloway Canal between 1875 by O.P. Calloway and 1877. Over time, the canal's prism (i.e., trapezoidal shape), head gates, weirs and other features have been replaced, repaired, or improved to allow for greater capacity and flow delivery to water users (Districts). As of late, modifications have been made to accommodate commercial, housing, and road development as the City of Bakersfield has slowly been expanding to the north. It is worth noting that the Project will not result in any modifications or effects to individual irrigation system features (e.g., headgates, canals, or flumes).

Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

The District's irrigation delivery system was completed in the mid-1970s. The District's irrigation delivery system is composed of two canal reaches referred to as the Pond-Poso and Buttonwillow Ridge Canal. In addition, the District operates a series of turnouts, spillway basins, recharge basins, pump stations and discharge pipelines as part of its conveyance system. The District began importing State Water Project water in 1973. The Pond-Poso Spreading and Recovery Facility

became operational in 2010. The proposed Project will not alter any existing features of an irrigation system.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

Based on the 2017 EA , the Calloway Canal was the only cultural resources located within the Area of Potential Effect (APE). The canal, however, was determined to not be eligible for inclusion on the National Register of Historic Places. Therefore, it is assumed the Office of Historic Preservation would concur with a finding of no historic properties affected during National Historic Preservation Act Section 106 consultation.

Are there any known archeological sites in the proposed project area?

Based on the2017 EA, which included a pedestrian survey and record search, no prehistoric or historic-era archaeological sites were found. Therefore, it is assumed there are no archeological sites in the proposed Project area.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

Based on the 2017 EA, Reclamation did not identify adverse human health or environmental effects on any population. Therefore, it is assumed the proposed Project would not have a significant or disproportionately negative impact on low-income or minority individuals.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

Based on the 2017 EA, the nearest Indian Trust Asset (ITA) is a public domain allotment located approximately 40 miles northeast of the Project site. The Project would not impact the ITA. Moreover, the Project would not limit access to , and ceremonial use of, Indian sacred sites.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

North Kern would implement best management practices to ensure that the proposed Project would not contribute to the introduction or spread of noxious weeds or non-native invasive species. Because of routine maintenance, which North Kern will continue, noxious weeds and non-native invasive species do not presently exist within the Calloway Canal.

4. Permits and Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals. Recipients shall adhere to Federal, state, territorial, tribal, and local laws, regulations, and codes, as applicable, and shall obtain all required approvals and permits. Recipients shall also coordinate and obtain approvals from site owners and operators.

The District will adhere to applicable laws, regulations, and codes and will ensure required approvals and permits are obtained. It is anticipated that some permits will be required. The awarded contractor will be responsible for obtaining all necessary permits and approvals. The Project is located exclusively within maintained rights-of-way owned and operated by North Kern. As such, it is expected that requirements for permits and approvals will be minimal. The following potential permits and approvals will be addressed.

The construction specifications will include language relating to obtaining permits and approvals prior to construction. In particular, the standard language in the specifications state "The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits and licenses therefore…". Such permits and approvals may include, preparing and implementing a Stormwater Pollution Prevention Plan pursuant to the National Pollution Discharge Elimination System (Clean Water Act Section 402) and obtaining a Construction Notification and Dust Control Plan to the San Joaquin Valley Air Pollution Control District. Additionally, a pre-construction survey for special-status species will be conducted by a qualified biologist immediately prior the start of construction.

Pursuant to Section 17.28.040(B)(5) of the Kern County Code of Ordinances, the District is exempt from obtaining a grading permit. Likewise, pursuant to Section 17.66.020(C)(7) of the City of Bakersfield Municipal Code, the District is exempt from obtaining a grading permit. Accordingly, the District will not seek a County or City grading permit.

5. Official Resolution

The Official Resolution is included on the following pages.

BEFORE THE BOARD OF DIRECTORS
OF THE NORTH KERN WATER STORAGE DISTRICT

ON BEHALF OF ITSELF AND ROSEDALE RANCH IMPROVEMENT DISTRICT

IN THE MATTER OF: RESOLUTION NO. 20-86

RESOLUTION OF INTENTION OF NORTH KERN WATER STORAGE DISTRICT TO FILE AN APPLICATION WITH THE BUREAU OF RECLAMATION FOR A GRANT UNDER THE *WATERSMART GRANTS: WATER AND ENERGY EFFICIENCY GRANTS FOR FISCAL YEAR 2021 BOR-DO-21-F001*

WHEREAS, North Kern Water Storage District partnered with several neighboring water districts and formulated the Poso Creek Integrated Regional Water Management Plan (Plan), adopted in July 2007 and updated in 2014 and 2019 by each of the districts for their collective area; and

WHEREAS, District staff, in conjunction with surrounding water districts, communities, and stakeholders, has formulated a plan of improvements; and

WHEREAS, the Plan identified regional projects that, once implemented, would improve the water management of the Region and the ability for North Kern to regulate water supplies available to the district; and

WHEREAS, the Plan promotes a regional recharge, reduction of overdraft, and operation changes in responding to reductions in water supply reliability to the region; and

WHEREAS, District staff has formulated a project improvement, referred to as *Calloway Canal Lining: 7th Standard Road to 8-1Backup Weir*, which has the support of surrounding water districts and communities; and would be funded by a combination of North Kern Water Storage District funds and grant funds; and

WHERAS, water will be conserved by lining improvements made to the Calloway Canal; and

WHEREAS, the United States Bureau of Reclamation is currently soliciting proposals for grant funding assistance under their *WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2021* (Funding Opportunity No BOR-DO-21-F001); and

WHEREAS, District staff has formulated a grant proposal to line a portion of the Calloway Canal.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the North Kern Water Storage District as follows:

a. The District's Manager, Richard Diamond, and Deputy General Manager, Ram Venkatesan, are hereby authorized and directed to submit the grant application and are authorized to enter into an agreement with Reclamation on behalf of North Kern Water Storage District for grant funding under Reclamation's *WaterSMART Grants: Water and Energy Efficiency Grants.*

b. The District's Board of Directors has reviewed and supports the submission of a grant application to Reclamation entitled *Calloway Canal Lining: 7th Standard to 8-1Backup Weir.*

c. The Applicant is capable of providing the amount of funding specified in the application.

d. The Applicant will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

PASSED, APPROVED AND ADOPTED on this 15th day of September, 20 20 by the following roll-call vote:

AYES: Andrew, Mendes, Ackerknecht, Fornoff and Glende

NOES: None

ABSENT: None

ABSTAIN: None

NORTH KERN WATER STORAGE DISTRICT

President/Board of Directors

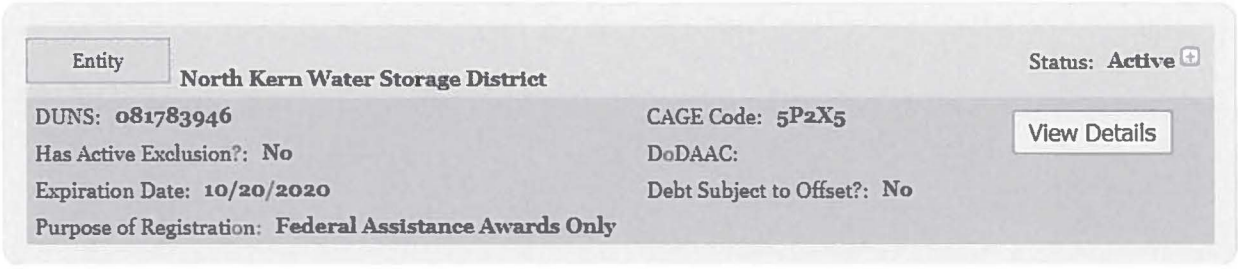
ATTEST:

Board of Directors

6. System of Award Management

The District is registered in the System for Award Management (SAM), as shown in the figure below, and will maintain an active SAM registration with current information while it has active Federal awards or applications under consideration. The District's unique entity identifier is 95-6002222 and is included on the SF-424.

Figure 7. System of Award Management Registration



Appendix A

Letter of Support

POSO CREEK IRWMP
Management Group

August 27, 2020

Mr. Richard Diamond, General Manager
Mr. Ram Venkatesan, Deputy General Manager
North Kern Water Storage District
33380 Cawelo Avenue
Bakersfield, CA 93308

Re: *Calloway Canal Lining: 7th Standard Road to 8-1Backup Weir* Project

Dear Mr. Diamond and Mr. Venkatesan,

On behalf of the Poso Creek Integrated Regional Water Management (IRWM) Group, I would like to express support of North Kern Water Storage District's (NKWSD) efforts to improve the Calloway Canal.

The Poso Creek IRWM Group is supportive of and interested in the *Calloway Canal Lining: 7th Standard Road to 8-1 Backup Weir* Project, as it will conserve groundwater by more effectively delivering surface supplies into the basin and will improve operational flexibility and efficiency within the region.

This Project is an important improvement that will be of great benefit to both NKWSD and other districts within the Poso Creek IRWM Region. I hope that our expressed support is helpful in your efforts to secure grant funding assistance to implement this project. If the funding agency would like to discuss our interest and support of your project, I would be happy to do so.

Sincerely,

Dana Munn
Chairman
Poso Creek IRWM Group
dmunn@swid.org
(661) 758-5153

Appendix B

RS Mean's Historical Cost Index

Historical Cost Indexes

The table below lists both the RSMeans® historical cost index based on Jan. 1, 1993 = 100 as well as the computed value of an index based on Jan. 1, 2020 costs. Since the Jan. 1, 2020 figure is estimated, space is left to write in the actual index figures as they become available through the quarterly *RSMeans Construction Cost Indexes.*

To compute the actual index based on Jan. 1, 2020 = 100, divide the historical cost index for a particular year by the actual Jan. 1, 2020 construction cost index. Space has been left to advance the index figures as the year progresses.

Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2020 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2020 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2020 = 100	
	Est.	Actual	Est.	Actual		Actual	Est.	Actual		Actual	Est.	Actual
Oct 2020*					July 2005	151.6	63.4		July 1987	87.7	36.7	
July 2020*					2004	143.7	60.1		1986	84.2	35.2	
Apr 2020*					2003	132.0	55.2		1985	82.6	34.6	
Jan 2020*	239.1		100.0	100.0	2002	128.7	53.8		1984	82.0	34.3	
July 2019		232.2	97.1		2001	125.1	52.3		1983	80.2	33.5	
2018		222.9	93.2		2000	120.9	50.6		1982	76.1	31.8	
2017		213.6	89.3		1999	117.6	49.2		1981	70.0	29.3	
2016		207.3	86.7		1998	115.1	48.1		1980	62.9	26.3	
2015		206.2	86.2		1997	112.8	47.2		1979	57.8	24.2	
2014		204.9	85.7		1996	110.2	46.1		1978	53.5	22.4	
2013		201.2	84.1		1995	107.6	45.0		1977	49.5	20.7	
2012		194.6	81.4		1994	104.4	43.7		1976	46.9	19.6	
2011		191.2	80.0		1993	101.7	42.5		1975	44.8	18.7	
2010		183.5	76.7		1992	99.4	41.6		1974	41.4	17.3	
2009		180.1	75.3		1991	96.8	40.5		1973	37.7	15.8	
2008		180.4	75.4		1990	94.3	39.4		1972	34.8	14.6	
2007		169.4	70.8		1989	92.1	38.5		1971	32.1	13.4	
2006		162.0	67.8		1988	89.9	37.6		1970	28.7	12.0	

Adjustments to Costs

The "Historical Cost Index" can be used to convert national average building costs at a particular time to the approximate building costs for some other time.

Time Adjustment Using the Historical Cost Indexes:

$$\frac{\text{Index for Year A}}{\text{Index for Year B}} \times \text{Cost in Year B} = \text{Cost in Year A}$$

Example:

Estimate and compare construction costs for different years in the same city.

To estimate the national average construction cost of a building in 1970, knowing that it cost $900,000 in 2020:

INDEX in 1970 = 28.7

INDEX in 2020 = 239.1

$$\frac{\text{INDEX 1970}}{\text{INDEX 2020}} \times \text{Cost 2020} = \text{Cost 1970}$$

$$\frac{28.7}{239.1} \times \$900{,}000 = .120 \times \$900{,}000 = \$108{,}000$$

The construction cost of the building in 1970 was $108,000.

Note: The city cost indexes for Canada can be used to convert U.S. national averages to local costs in Canadian dollars.

Example:

To estimate and compare the cost of a building in Toronto, ON in 2020 with the known cost of $600,000 (US$) in New York, NY in 2020:

INDEX Toronto = 115.6

INDEX New York = 137.1

$$\frac{\text{INDEX Toronto}}{\text{INDEX New York}} \times \text{Cost New York} = \text{Cost Toronto}$$

$$\frac{115.6}{137.1} \times \$600{,}000 = .843 \times \$600{,}000 = \$505{,}908$$

The construction cost of the building in Toronto is $505,908 (CN$).

2018 Index = 222.9
2020 Index = 239.1
2020 Price/LF = $618

222.9/239.1 (x) = 618

222.9x = 147,763.80

x = 662.92

*Historical Cost Index updates and other resources are provided on the following website:
http://info.thegordiangroup.com/RSMeans.html