

Belridge Water Storage District
***415 AND 500 CANAL RESERVOIR LINING
PROJECT
KERN COUNTY, CA***

**APPLICATION SUBMITTED TO
UNITED STATES BUREAU OF RECLAMATION
FOR A
WaterSMART: WATER AND ENERGY EFFICIENCY GRANT
FOR FISCAL YEAR 2023**

(FUNDING OPPORTUNITY ANNOUNCEMENT NO. R23AS00008)

July 28, 2022



BELRIDGE WATER STORAGE DISTRICT

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TABLE OF CONTENTS

TECHNICAL PROPOSAL	1
1 . EXECUTIVE SUMMARY	1
GENERAL PROJECT INFORMATION:	1
PROJECT SUMMARY:	1
2 . BACKGROUND DATA	2
LOCATION:	2
WATER SUPPLY SOURCE AND WATER SUPPLY SYSTEM:	2
LAND USE:	3
ENERGY INTENSITY:	5
PAST WORKING RELATIONSHIPS WITH THE UNITED STATES BUREAU OF RECLAMATION:	5
3 . TECHNICAL PROJECT DESCRIPTION	5
OVERVIEW:	5
PROJECT BENEFITS:	6
URGENCY OF PROJECT:	6
SITE PHOTOGRAPHS:	9
PROPOSED FACILITIES:	12
NO ACTION:	12
SCOPE OF WORK	12
WORK COMPLETED TO DATE:	12
PROJECT TASKS:	12
4 . PERFORMANCE MEASURES	15
5 . EVALUATION CRITERIA	15
CRITERION A-- QUANTIFIABLE WATER SAVINGS: (UP TO 28 POINTS):	15
CRITERION B – RENEWABLE ENERGY (UP TO 20 POINTS)	17
SUB-CRITERION B.1-- IMPLEMENTING RENEWABLE ENERGY PROJECTS RELATED TO WATER MANAGEMENT AND DELIVERY (UP TO 20 POINTS)	17
SUB-CRITERION B.2-- INCREASING ENERGY EFFICIENCY IN WATER MANAGEMENT (UP TO 10 POINTS)	17
CRITERION C—SUSTAINABILITY BENEFITS: (UP TO 20 POINTS)	19
PROJECT BENEFITS:	21
CRITERION D—COMPLEMENTING ON-FARM IRRIGATION IMPROVEMENTS (UP TO 10 POINTS)	23
CRITERION E. PLANNING AND IMPLEMENTATION (UP TO 8 POINTS)	27
SUBCRITERION E.1 - PROJECT PLANNING.	27
BELRIDGE WATER STORAGE DISTRICT 2020 AGRICULTURAL WATER MANAGEMENT PLAN	27
KERN COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN	27
CALIFORNIA WATER PLAN	29
SUBCRITERION E.2 READINESS TO PROCEED.	30
CRITERION F—COLLABORATION (UP TO 6 POINTS)	31
SUBCRITERION G ADDITIONAL NON-FEDERAL FUNDING (UP TO 4 POINTS)	32
CRITERION H NEXUS TO RECLAMATION (UP TO 4 POINTS)	32
ENVIRONMENTAL & CULTURAL RESOURCES COMPLIANCE	32

REQUIRED PERMITS OR APPROVALS	35
OFFICIAL RESOLUTION	36
FUNDING PLAN AND LETTERS OF COMMITMENT	36
BUDGET PROPOSAL	38
BUDGET NARRATIVE	38

TABLES

Table 1: Kern IRWM Plan Objectives Addressed by Project	29
Table 2: Summary of non-Federal and Federal Funding Sources	37
Table 3: Funding Group I Funding Request.....	37
Table 4: Funding Sources	38
Table 5: Project Budget Table	38

FIGURES

Figure 1: District Location Map.....	4
Figure 2: Project Location Map.....	7
Figure 3: Salinity of Shallow Groundwater in the Lost Hills Area	8

PHOTOGRAPHS

Photograph 1: Google Earth Aerial of 415 Reservoir.....	9
Photograph 2: Google Earth Aerial of 500 Reservoir.....	10
Photograph 3: LHWD SA-1 Reservoir 1-2 (has HDPE Liner, example of proposed liner in BWSD 415 and 500 Reservoirs.....	11

ATTACHMENTS

- 1 - Seepage Calculations
- 2 - Preliminary Design Drawings
- 3 – Energy Use Estimate
- 4 - Project Schedule
- 5 - Adoption Resolution
- 6 - Financial Report
- 7 - Construction Cost Estimate
- 8 - Estimated Consultant Fees
- 9 – Belridge Water Storage District Project Support Letter
- 10- Emails between P&P and NRCS

List of Abbreviation

AF	Acre-feet
BOD	basis of design
CASGEM	California State Groundwater Elevation Monitoring
CEQA	California Environmental Quality Act
CO ₂ e	carbon dioxide equivalent
CVC	Cross Valley Canal
CVP	Central Valley Project
DAC	Disadvantaged Community
DCP	Dust Control Plan
DWR	California Department of Water Resources
IRWMP	Integrated Regional Water Management Plan
IS	Initial Study
KCWA	Kern County Water Agency
MND	Mitigated Negative Declaration
NEPA	National Environmental Policy Act
P&P	Provost & Pritchard Consulting Group
PG&E	Pacific Gas & Electric
PS&E	plans, specifications and estimates
SJVAPCD	San Joaquin Valley Air Pollution Control District
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation

TECHNICAL PROPOSAL

1 . Executive Summary

General Project Information:

Proposal Name: Belridge Water Storage District –415 and 500 Canal Reservoir Lining Project

Date: July 28, 2022

Applicant Name: Belridge Water Storage District

City, County, State: McKittrick, Kern County, California

[Note that the applicant has not made payment to any lobbying entity for influencing anyone in connection with a covered Federal action. Therefore, the SF-LLL form is not required for this application.]

Project Summary:

The 415 and 500 Canal Reservoir Lining Project includes installation of HDPE liner to line two reservoirs in the canal system to reduce seepage and improve water reliability. The Project also includes promotion of NRCS on farm water conservation programs to Belridge Water Storage District growers. The estimated reduction in seepage from lining the 415 and 500 Canal Reservoirs is 438 AF/year (acre feet per year). Promotion of NRCS programs is expected to result in about 438 AF/year of additional savings. That seepage water in District and on-farm reservoirs is currently lost to beneficial use in the area's salty shallow groundwater. With the project water that would have been lost will stay in the water delivery systems and be delivered to existing agricultural lands served by the 415 and 500 Canals in Belridge Water Storage District (BWSD). Energy savings will be realized, and greenhouse gas emissions reduced by eliminating the need to replace the lost water with other supplies. Those supplies would also be pumped through State and Federal Water Project pumps as well as the district's pump stations and from water banks the District participates in. No project components will be located on Federal facilities or lands. Work on the project is proposed to be done in Federal Fiscal Years 2023 and 2024.

2 . Background Data

BWSD is a California Water Storage District formed by interested landowners in 1962 to provide a vehicle for construction, operation, and maintenance of an irrigation project providing irrigation water from the State Water Project (SWP) to land within the District. The California Water Code gives the District the authority to receive grant funds and construct infrastructure projects. BWSD is a “member unit” of the Kern County Water Agency (KCWA or Agency) through which BWSD and other member units executed water supply contracts with the Agency in the mid 1960’s. KCWA acts as an umbrella agency to contract with the State of California for State Water Project (SWP) Water. After contract execution with the Agency, the District’s distribution system was built and water deliveries commenced in 1968.

Location:

BWSD is located in western Kern County, California, in the southern end of the San Joaquin Valley and encompasses 99,819 acres of land. **Figure 1** is a vicinity map showing the location of BWSD and the proposed project.

Water Supply Source and Water Supply System:

Most of the water supply utilized within the District is surface water from the SWP delivered to the District through the California Aqueduct (Aqueduct) by virtue of the KCWA contract. In most years, the District purchases supplemental water supplies from KCWA and from other sources to partially offset SWP shortages.

The District’s annual entitlement of SWP water is 119,110 AF. Historically in many years, Article 21 water and Turnback water has been available for purchase that can be used to supplement the District’s contract supply. But those supplies have diminished in recent years. In many years, the District is water short and needs to purchase supplemental water from others besides KCWA. Also, the landowners will periodically transfer water into the District to help meet their crop water requirements.

The District's contracted water allotment is subject to deficiencies. Historically these shortages were due to drought conditions but in recent years significant deficiencies are also the result of numerous restrictions in the delta by water quality and fishery agencies. In fact, water supply deficiency is one of the major concerns of the District. Without a firm water supply, it is difficult, if not impossible, for growers to effectively plan for the coming growing season. Often the anticipated water supply changes from month to month and is not finalized until late spring or early summer, by which time it may be too late for a grower to obtain financing or obtain economical supplemental water for crops.

Groundwater underlying the District is salty and unsuitable for irrigation. The District participates in the Berrenda Mesa and Pioneer groundwater banking projects to supplement dry-year water supplies. The average amount of banked water recovered from both projects

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USBR WEEG Application**

during the five-year planning cycle in its 2020 Agricultural Water Management Plan was 14,508 AF/year.

Land Use:

Of the 99,819 acres in the District, 88,223 acres are farmable (District acreage less in Industrial Zone), although not all this acreage is currently being farmed. Service Area 9 contains oil production fields and is not farmable. The net cropped area in 2020 was 34,461 acres.

**Belridge Water Storage District
USBR WEEG Application**

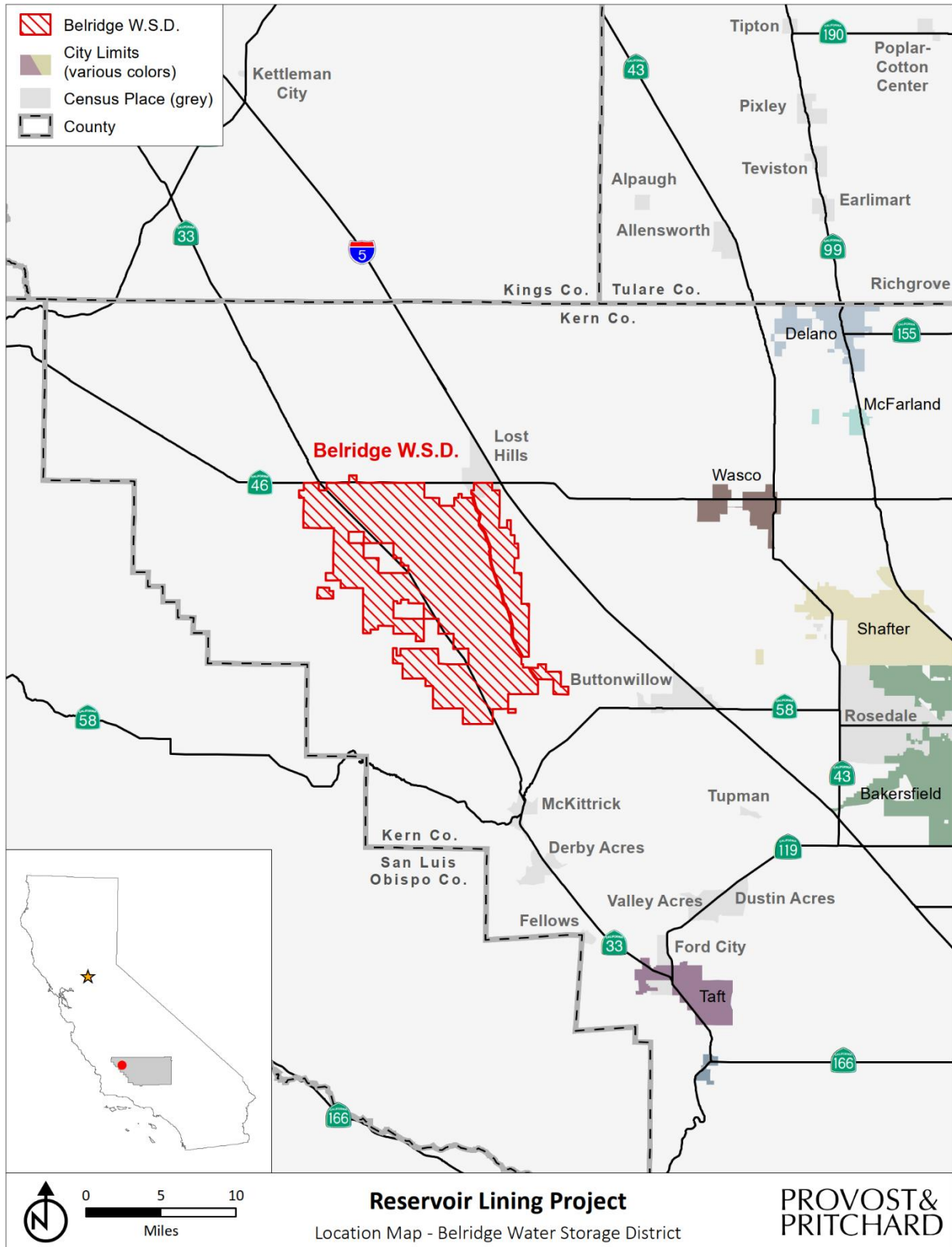


Figure 1: District Location Map

Energy Intensity:

Water lost to seepage is all pumped water. BWSD currently uses power from the Pacific Gas & Electric Company (PG&E). Energy is needed to pump water into the 415 and 500 Canal Systems from the California Aqueduct at BWSD's Pump Stations A and B. Prior to that State and Federal water project pumps are used to deliver water via the California Aqueduct to Pump Station A. State and Federal pumps use power from the State and Federal projects' power systems. PG&E power is also used by the water banks BWSD participates in. **Attachment 3** documents energy intensity for BWSD, DWR, Reclamation, and water bank pumps utilized in delivering the lost water. Energy intensity is *'the energy consumption per unit volume of water through one or several consecutive segments of the water use cycle'*. Provost & Pritchard Consulting Group prepared the estimate using data from the agencies that operate the various pumps involved.

Past Working Relationships with the United States Bureau of Reclamation:

In the past, BWSD has had the following working relationships with Reclamation:

1. All operations of the SWP, which provides BWSD's primary water supply, are coordinated with Reclamation under a Coordinated Operation Agreement. This is because both the State and Federal water projects deliver water through the Sacramento River, San Joaquin and Sacramento River delta, and the California Aqueduct/San Luis Canal (which is a joint State and Federal facility from the Delta to the Kern County line) serving both federal water contractors and SWP contractors.
2. KCWA frequently obtains contracts for San Joaquin River Floodwater (called Section 215 water) from the USBR. These are temporary annual contracts. This water is an important supplementary supply for BWSD.
3. KCWA frequently performs water exchanges and transfers with Reclamation and interconnections between State and federal canal systems to facilitate water exchanges and transfers that BWSD participates in as well as for water bank operations BWSD participates in.

3 . Technical Project Description

Overview:

The proposed project includes lining the 415 Reservoir and 500 Reservoir in the 415 and 500 Canal Systems with HDPE liner. The 415 Reservoir has an area of approximately 4.9 acres (about 213,000 square feet) and the 500 Reservoir 3 has an area of approximately 4.5 acres (about 196,000 square feet). The lining will reduce seepage, increase water reliability, reduce maintenance efforts, and reduce the potential for reservoir breaches. The proposed project also includes promotion of NRCS on farm water conservation programs to District growers through mailing of NRCS literature to District customers and posting of information on the District's web site and at the District office. **Figure 1** shows the location of BWSD. **Figure 2** provides a more detailed map of the project location.

Both of the reservoirs were built with asphalt slope protection and clayey soil bottoms in 1968 during construction of the original district distribution system. The reservoirs help to regulate

flows in the canal systems. This application proposes to make improvements to reduce seepage from the reservoirs as the asphalt slope protection has degraded, the clay bottom has thinned due to erosion and occasional dredge cleaning, and excessive seepage occurs.

Lining the reservoirs will eliminate water losses due to seepage. These losses are especially detrimental because water supplies are very limited and the lost water goes into the region's salty shallow groundwater rather than recharge an aquifer that has beneficial use. **Figure 3** shows the salinity of first-encountered groundwater in the Lost Hills and Belridge area.

Project Benefits:

Major project benefits will include:

- Conservation of water through reduction in seepage.
- Energy and cost savings related to the energy currently required to pump the water from source to the reservoir locations.
- Reduction in greenhouse gas emissions through energy savings.
- Improved water reliability due to lower losses and reservoir breaches.

Project beneficiaries will be farmers who farm in BWSD's areas service by the 415 and 500 Canals. The project will conserve water and reduce the cost of water deliveries. The region covering the Kern Groundwater sub-basin will also benefit from reduced groundwater recovery from the area's groundwater banks, which are in an overdrafted groundwater basin. Property owners adjacent to the reservoirs will also benefit from a lower risk of reservoir breaching and flooding.

Urgency of Project:

The project is urgently needed for the following reasons:

- Reduce canal system seepage and preserve water supplies, always important and even more during droughts.
- Reduce the need to recover groundwater at groundwater banks in Kern County to compensate for seepage losses and help reduce groundwater overdraft consistent with the provisions of the California Sustainable Groundwater Management Act (SGMA).
- Improve the reliability of water supplies by guaranteeing higher deliveries through a reduction in seepage losses.

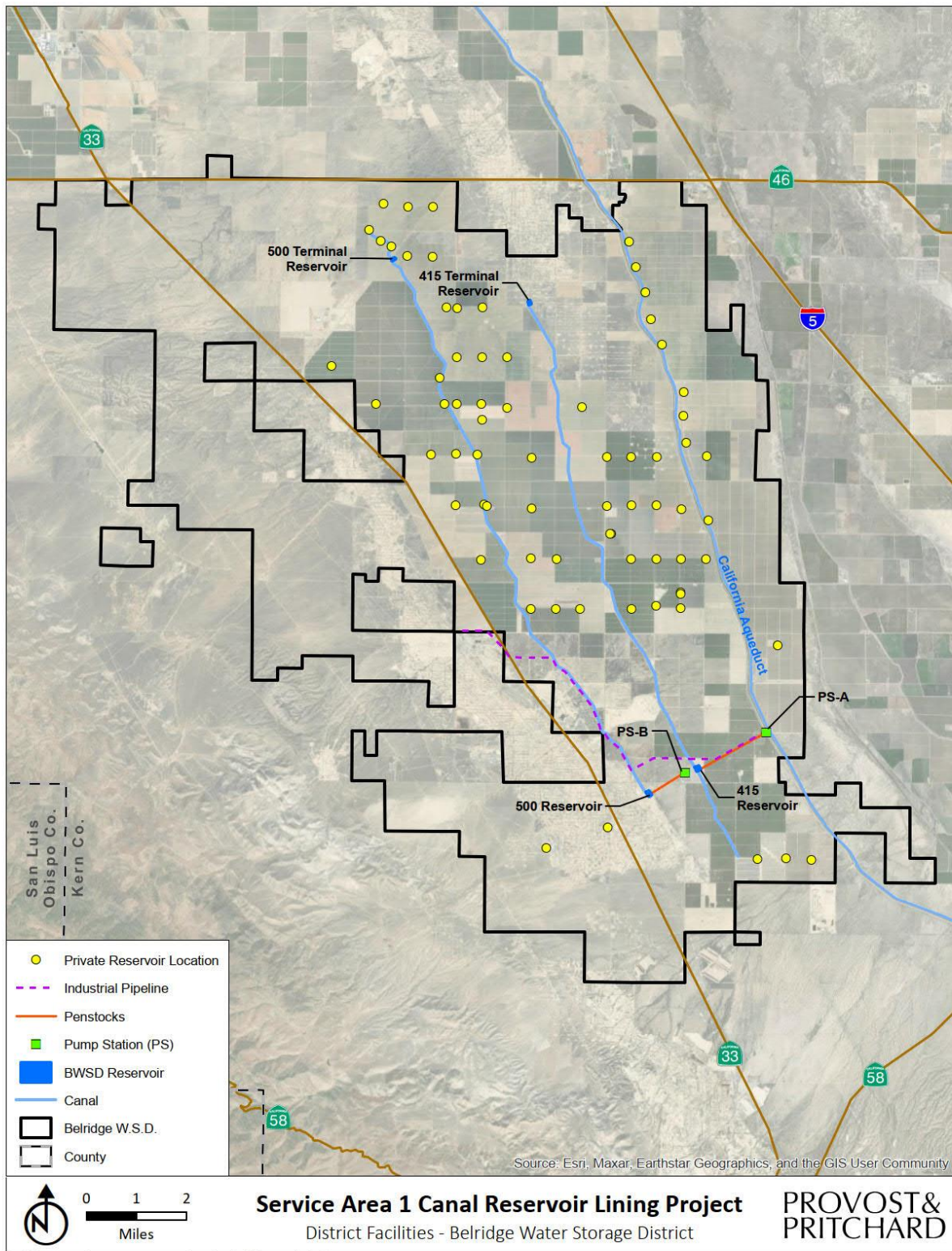


Figure 2: Project Location Map



CALIFORNIA DEPARTMENT OF WATER RESOURCES

Perched groundwater quality is characterized by the DWR using EC in $\mu\text{mhos/cm}$. In the BWSD, LHWD, and DRWD, the perched water EC ranges from 2,000 to greater than 20,000 $\mu\text{mhos/cm}$ (Figure 8). Compared to the Secondary Drinking Water Standard for EC (900 $\mu\text{mhos/cm}$ Recommended and 2,200 $\mu\text{mhos/cm}$ for Short-term Use, Section 64449, Title 22, California Code of Regulations), the quality of perched groundwater is not suitable as a drinking water source. (Generally, TDS in mg/L is approximately 0.7 of EC in $\mu\text{mhos/cm}$.)

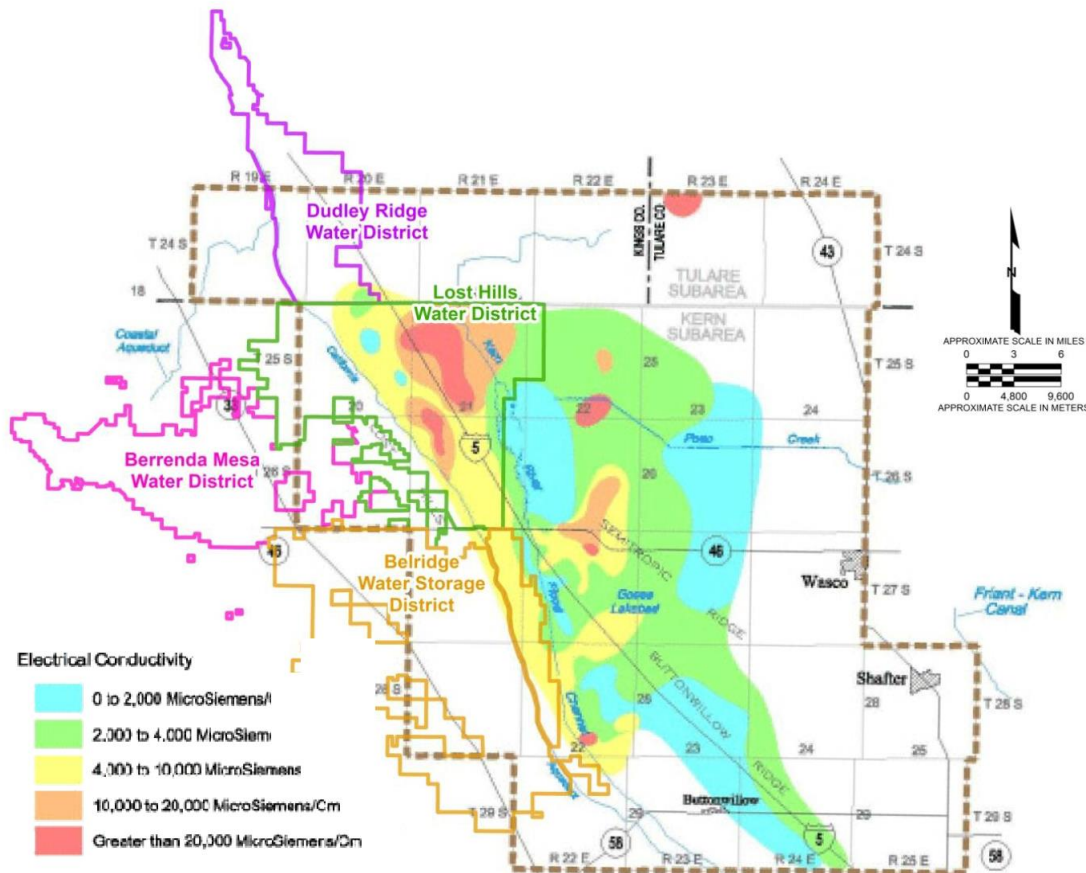
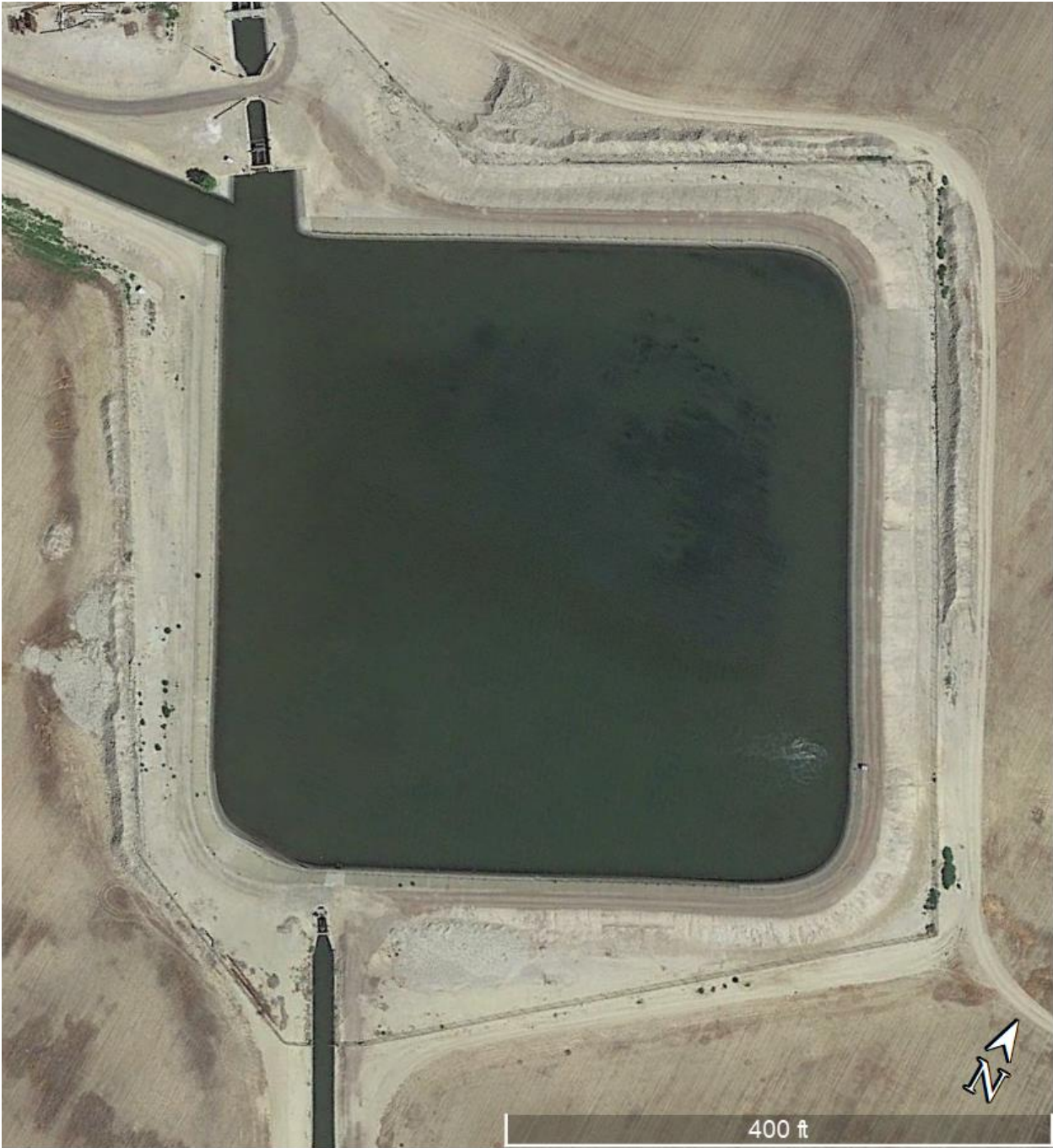


Figure 8 – 2001, Electrical Conductivity in Shallow Groundwater, Lost Hills Area (modified from DWR, 2001)

In 1993, the DWR published the results of a 1991 study of shallow groundwater in the vicinity of eastern part BWSD (DWR, 1993). Initially, DWR installed 88 shallow piezometers (20 feet deep) and 15 deeper piezometers (up to 55 feet deep) in the eastern part of BWSD and the nearby Buena Vista Water Storage District (BVWSD). In 1992, the DWR collected depth-to-water measurements and groundwater samples from the 55 piezometers. DWR found that the depth to shallow water below BWSD ranged from 5 to 10 feet on the eastern edge of BWSD to about 20 feet below the California Aqueduct. DWR indicated that groundwater generally flowed from west to east and groundwater EC varied from about 3,000 $\mu\text{mhos/cm}$ along the eastern edge of BWSD to more than 18,000 $\mu\text{mhos/cm}$ under the California Aqueduct (Figure 9).

Figure 3: Salinity of Shallow Groundwater in the Lost Hills Area

Site Photographs:



Photograph 1: Google Earth Aerial of 415 Reservoir



Photograph 2: Google Earth Aerial of 500 Reservoir



Photograph 3: LHWD SA-1 Reservoir 1-2 (has HDPE Liner, example of proposed liner in BWSD 415 and 500 Reservoirs

Proposed Facilities:

The proposed facilities include HDPE liner placed over a prepared subgrade in the existing reservoirs with an anchor trench around the reservoirs' perimeter.

No Action:

The "Without-project" conditions are assumed to be similar to historical conditions for the last 12 years of operations. Seepage would continue every year with total losses averaging 438 AF/year. Also, additional energy would be used, and greenhouse gas emissions would occur to acquire the lost water from other sources.

Scope of Work

Work Completed to Date:

Work completed to date includes selection of liner material, preliminary design drawings and specifications plus a preliminary cost estimate,

- HDPE lining in Reservoir 2 in Lost Hills Water District's (LHWD) Service Area 1, installed in 2011, and HDPE Canal lining in LHWD's Service Area 7, installed in 2008, has proven to be effective and long lasting. Other liner materials have been used for canals and reservoirs in BWSD and LHWD, including asphalt, concrete, and butyl rubber, but HDPE has proven to be the most effective for long-term seepage protection in the areas soils which have high clay and salt content.

Preliminary construction plans (approximate design level of 15%) have been prepared for the project that shows the limits of construction, a proposed cross section, and construction details (see **Attachment 2**).

Project Tasks:

Task 1 - Administration: Tasks include meetings with USBR, implementing the contracts and agreements, administration of the overall grant, administration of project, coordination and correspondence with sub-consultants, and preparation of quarterly invoices.

Deliverables: Meeting minutes, Quarterly Invoices

Task Status: 0% - Work has not begun on this task.

Task 2 - Reporting: This task includes preparation of semi-annual reports during the project, which will document progress to date, and discuss any issues related to budget or schedule. This task also includes a final performance/progress report and a Draft and Final Project Report.

Deliverables: Semi-Annual Progress Reports, Draft Report and Final Report.

Task Status: 0% - Work has not begun on the above tasks.

Task 3 – Land Purchase/Easement: BWSD owns the land at the reservoir sites. No land purchase or easement work is needed.

Deliverables: Copy of County Assessor's Map documenting District ownership

Task Status: 100% - District owns the land.

Task 4 - Assessment and Evaluation: A licensed geotechnical firm will perform a geotechnical review of subgrade preparation needed for the HDPE liner project including what to do with existing slope protection and soil in the bottom.

Deliverables: Geotechnical report, updated reservoir survey base map, and preliminary cost estimate.

Task Status: 10% - Engineering consultant has completed preliminary liner design memorandum

Task 5 - Final Design:

Subtask 5.1 – Update prior reservoir survey base maps and Utility Investigation: BWSD consultant will conduct topographic survey to update survey information taken from the original construction plans for the two reservoirs. Existing utilities will be identified and incorporated into the updated survey base maps for construction drawings.

Subtask 5.3 – Project Design: A basis of design (BOD) memorandum will be prepared for the project that documents the assumptions, design criteria, and proposed design. After approval of the BOD, the Plans, Specifications and Cost Estimates (PS&E) will be prepared for the reservoir lining project. The PS&E will be prepared at 50%, 90%, and 100% design levels for review by BWSD staff. QA/QC reviews will be conducted at each interval by a Principal level engineer. At completion of this subtask, the PS&E will be incorporated into contract documents for bid by Contractors.

Deliverables: BOD memorandum, 50%, 90%, and 100% PS&E, contract documents

Task Status: 0% - Work has not begun on the above tasks

Task 6 - Environmental Documentation: This task includes complying with both the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). Preparation of CEQA/NEPA compliance documents including a CEQA Initial Study and NEPA Environmental Assessment, biological review, and cultural resources review. Tribal notification will be included in the process.

Deliverables: Adopted CEQA and NEPA document and all notices

Task Status: 0%

Task 7 - Permitting: This task involves applying for and securing the appropriate local and state permits for the project. The BWSD owns and operates the reservoirs and does not need special permits to modify them. The following routine permits are expected. No major regulatory hurdles are expected to delay completion of the project.

Subtask 7.1 – SWPPP: A Storm Water Pollution Prevention Plan (SWPPP) will be prepared in accordance with the State Water Resources Control Board (SWRCB) requirements and uploaded to their website.

Subtask 7.2 – DCP: A Dust Control Plan (DCP) will be prepared and filed the San Joaquin Valley Air Pollution Control District (SJVAPCD) if necessary.

Deliverables: SWPPP, DCP

Task Status: 0% - Work has not begun.

Task 8 - Construction Contracting: Issue contract documents for a minimum 30-day public noticed bid. Assist during bidding process including job walks, bid opening and bid review. Prepare addendums, if necessary, prior to contract bid date. Select lowest responsible qualified bidder. Award contract.

Deliverables: Advertisement for bids; pre-bid contractors meeting notes; evaluation of bids; contract award.

Task Status: 0% - Work has not begun.

Task 9 - Construction:

Subtask 9.1: Mobilization and Site Preparation: Anchor trench alignments will be staked by surveyors for construction. Contractors will locate existing utilities (USA) and mobilize equipment.

Subtask 9.2: Construction: A temporary earthen bypass will be constructed to convey water during the project. Sediment and asphalt lining will be removed from the Reservoir. The Reservoir subgrade and anchor trenches will be prepared, reservoir lining will be installed, and anchor trenches will be backfilled in accordance with the Plans and Specifications. The asphalt will be pulverized and placed on the access road surface to improve drivability in weather conditions.

Subtask 9.3: Performance Testing & Demobilization: Reservoir lining will be tested in accordance with the specifications.

Deliverables: Meeting notes for canal operations training

Task Status: 0% - Work has not begun.

Task 10 - Environmental Compliance/Mitigation/Enhancement: Prepare field reviews and compliance documentation in accordance with the SWPPP, DCP, and CEQA/NEPA mitigation measures.

Deliverables: Field review reports and compliance documentation for the SWPPP, DCP, CEQA and NEPA.

Task Status: 0% - Work has not begun.

Task 11 - Construction Administration: Work consists of processing contractor requests for payment, material submittal reviews, holding a pre-construction meeting, construction monitoring, soil compaction and materials testing, responding to requests for information (RFIs), issuing change orders as needed, preparation of project record drawings, and project closeout.

Deliverables: preconstruction and progress meeting minutes, construction photographs, change orders, pay requests, record drawings, certificate of project completion

Task Status: 0% - Work has not begun.

Task 12 – Public Outreach: Public outreach will be performed to educate the public on the grant award, the construction schedule, and the project benefits plus promote NRCS programs. Public outreach will be accomplished through the following: 1) A press release will be posted on the BWSO website; 2) Adjacent landowners will be notified of the project; 3) Signs will be posted on the construction site explaining the project; 4) The grant award and project will be announced at a BWSO Board of Directors meeting and at a Kern Integrated Regional Water Management Group meeting.

Deliverables: Press release, notification letter to adjacent landowners, Board of Directors meeting minutes.

Task Status: 0% - Work has not begun.

Task 13 – Performance Measures Validation: This task includes validating the project performance through monitoring efforts. This will be performed for several months after project completion and the results will be reported to USBR. Monitoring will likely continue after the contract with USBR is over. Performance measures validation will be performed through monitoring: The NRCS District Conservationist will also be asked to review whether more District growers have implemented on farm water conservation measures and estimate the resulting water savings

- Reduction in seepage
- Reduction in energy use and greenhouse gas generation from reduced seepage

Deliverables: Project monitoring data

Task Status: 0% - Work has not begun.

4 . Performance Measures

See Task 13 above.

5 . Evaluation Criteria

Criterion A-- Quantifiable Water Savings: (Up to 28 points):

- **Describe the amount of estimated water savings:**

Approximately 438 acre-feet of water per year would be saved by the project's lining of two reservoirs. Seepage losses from the 415 Canal Reservoir are currently estimated at 228 acre-feet per year. These losses would be eliminated by installation of an impermeable HDPE liner. Seepage losses from the 500 Canal Reservoir are currently estimated at 210 acre-feet per year. These losses would also be eliminated by installation of an impermeable HDPE liner. Promotion of NRCS programs is also expected to result in about 438 AF of additional water savings because growers are expected to line on farm reservoirs that have about the same amount of seepage occurring in them as in BWSO's reservoirs. This is described in more detail in **Attachment 1**. Locations of on farm reservoirs are seen as yellow dots in **Figure 2**.

- **Describe Current Losses:**
 - Where are current losses going?
Seepage losses go underground and join salty impaired and unusable groundwater that underlays the area.
 - Explain how current losses are being used.
Water lost to seepage is not being used because it is too salty.
 - Are there any known benefits associated with where the current losses are going?
There are no benefits associated with current losses.
- **Describe the support/documentation of estimated water savings: Please Provide sufficient detail supporting how the estimate was determined, including all supporting calculations.**

Water level drop in the 415 Reservoir was monitored with an automatic water level sensor when there were no water deliveries from the reservoir or rain. Water surface evaporation was also estimated (using reference evapotranspiration amounts multiplied by a factor to adjust to reservoir evaporation) and the average daily drop due to seepage was calculated plus annual loss knowing the reservoir has water in it all year. **Attachment 1** shows the data that was used and calculations that were performed. Similar data for the 500 Reservoir was reviewed but seepage losses could not be determined due to poor quality data. Since it has the same type of construction as the 415 Reservoir, **Attachment 1** includes estimated losses for the 500 Reservoir assuming the loss rate per acre of the 415 Reservoir per acre of reservoir water surface is the same as the 500 Reservoir. **Attachment 1** also describes estimated water savings resulting from promotion of NRCS programs.
- **Please address the following questions according to the type of infrastructure improvement you are proposing for funding. Canal Lining/Piping**
 - How has the estimated average annual water savings that will result from the project been determined?
Daily losses of water in the BWSD reservoirs were estimated by reviewing daily water level sensor readings for how much the water levels drop during times of zero flow into or out of the reservoirs and deducting estimated evaporation occurring during the same time period. Calculations are detailed in **Attachment 1**.
 - How average annual losses were determined.
Annual losses were estimated by multiplying daily losses by the number of days per year the reservoirs store water (365 as both reservoirs operate year-round).
 - Expected post-project seepage/leakage losses and how were these estimates determined.
Losses are expected to be zero because HDPE liner is impermeable.
 - What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of the canal included in the project?
As the project involves reservoir lining rather than canal lining, transit losses in terms of acre-feet per mile and acre-feet per section are not applicable.

- How will actual canal loss seepage reductions be verified?
A post-project pond drop test will verify post-project losses in District reservoirs. The NRCS District Conservationist will be asked to verify savings resulting from promotion of the NRCS programs.
- Detailed description of materials being used.
HDPE liner consists of high-density polyethylene sheeting with a minimum thickness of 40 millimeters. Sheets come in rolls that are overlapped and heat-fused together at joints.

Criterion B – Renewable Energy (Up to 20 points)

Sub-criterion B.1-- Implementing Renewable Energy Projects Related to Water Management and Delivery (Up to 20 points)

Describe the amount of energy capacity. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate. Describe the amount of energy generated. Describe the status of a mothballed hydro plant. Describe any other benefits of the renewable energy project.

The project does not include new energy systems. However, the energy savings described below will reduce emissions of pollutants and greenhouse gases from natural gas fired power plants that provide some of the electricity to be conserved by the project.

Sub-criterion B.2-- Increasing Energy Efficiency in Water Management (Up to 10 points)

Describe any energy efficiencies that are expected to result from implementation of the water conservation or water efficiency project (e.g., reduced pumping).

- **If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.**

The project will result in energy savings by eliminating pumping associated with conveying water required to replace the water that is currently lost to seepage. Since a portion of BWSD's water is conveyed directly from the delta to BWSD and a portion is also conveyed to and from water banks, conserved energy has three components:

1. Conserved energy in SWP and Reclamation pumps to convey water to Kern County
2. Conserved energy in water banking conveyance and recovery pumps on the portion of water that is banked and recovered from groundwater banks.
3. Conserved energy in BWSD's Pump Stations A and B to convey water from the California Aqueduct into the 415 and 500 Canal systems

Attachment 3 documents energy use for the three components and adds them together. The

average energy use is approximately 567 kWh/AF of water saved

The resultant **annual average energy reduction** is estimated as:

$$567 \text{ kWh/AF} \times 438 \text{ AF} = 248,346 \text{ kWh}$$

The resultant **total lifetime energy reduction** is estimated as:

$$248,346 \text{ kWh/year} \times 50 \text{ years} = 12,417,300 \text{ kWh}$$

Similar additional energy reduction would be expected from the NRCS Promotion because water saved by lining on-farm reservoirs has the same energy intensity because it also goes through the same pump stations described in **Attachment 3**.

- **How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions.**

The reduction in energy required to pump water that has seeped from the reservoirs will reduce GHG emissions. The local electrical utility, PG&E, could not provide a 'local total-output emission rate' and only provided general information on GHG emissions when local data was requested.

A January 2013 memorandum from the San Joaquin Valley Unified Air Pollution Control District (which covers the project location and project benefit area) discussed GHG emissions from electrical use. The memo states:

"each electricity supplier may purchase and provide electricity from a variety of power plants that can vary from day to day and year to year. Because of this variability, it would be impossible to establish a GHG emission factor for each electricity supplier".

However, the memo does provide an emission factor of 313 kg CO₂e/MWh (or 0.313 kg CO₂e/kWh) for use in estimating GHG emissions in the geographic area covered by the Air Pollution Control District, and states that this value is '*accepted as a reasonable estimate*'. This value was therefore used in the GHG reduction calculations. This results in the following GHG emission reductions:

$$\text{Annual GHG emission reductions} = 248,346 \text{ kWh/year} \times 0.313 \text{ kg CO}_2\text{e/kWh} = \mathbf{77,732 \text{ kg CO}_2\text{e/year}}$$

$$\text{Project Lifetime GHG emission reductions} = 248,346 \text{ kWh} \times 0.313 \text{ kg CO}_2\text{e/kWh} \times 50 \text{ yrs} = \mathbf{3,886,615 \text{ kg CO}_2\text{e}}$$

Similar additional GHG emissions reductions are expected to result from the NRCS Promotion because applying the same emission factor to the NRCS Promotion's energy savings would

result in the same GHG reductions.

The effects of climate change will likely make imported water supplies less reliable in the future. It will reduce the natural storage and re-regulation of local surface water supplies by lessening the snowpack, increasing the amount of precipitation that comes in the form of rainfall, and likely reduce the overall volume of precipitation falling on the region. The project will help to mitigate this impact as well.

- **Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site origin.**

The energy savings estimate originates from the point of diversion in the Delta.

- **Does the calculation include any energy required to treat the water, if applicable?**

No

- **Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions? Please provide supporting details and calculations.**

No

- **Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).**

There will not be any renewable energy components as part of the project.

Criterion C—Sustainability Benefits: (Up to 20 points)

- **Provide information regarding how the project will enhance drought resilience by benefiting the water supply and ecosystem. Does the project seek to improve ecological resiliency to climate change?**

Ecological resiliency to climate change of endangered species in the Delta may benefit from the project if replacement water flows through the delta, but that is not primarily what the project seeks.

- **Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits.**

No

- **Will the project benefit species (ie endangered or federally threatened)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act.**

Yes. Endangered fish (Salmon and Delta Smelt) that are currently struggling in the Delta. The two species would benefit from the additional amount of water in the canal system that would otherwise be lost due to seepage.

- **Please describe any other ecosystem benefits as a direct result of the project?**

Not applicable

- **Will the project directly result in more efficient management of the water supply? For**

example, will the project provide greater flexibility to water managers resulting in a more efficient use of water supplies?

Yes, the project results in more efficient management of the District's and farm managers' existing supplies by reducing losses that currently occur in reservoirs.

- **Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.**

BWSD's primary water supply comes from a SWP contract with water originating in the Sacramento-San Joaquin Delta (Delta). The Delta has numerous endangered species issues that have resulted in curtailment of water supplies to contractors. The proposed project will conserve SWP water, reduce the need to import water purchased from Northern California and conveyed through the Delta to replace the lost water, reducing endangered species issues in the Delta.

The Delta is impacted by tremendous uncertainties related to changing hydrologic conditions associated with drought, government regulations, and climate change. This is illustrated by the State Water Project's allocation of 20% in 2020 and 0% in 2021. Long term average reliability, even with the State's proposed Delta Conveyance Project, is less than 60%. These factors put a premium on water conservation projects like the proposed project to stretch available supplies.

- **Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.**

Reliance on fossil fuels and potential interruptions in service are energy sustainability issues in California.

- **Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?**

Energy conservation reduces reliance on fossil fuels and contributes to better reliability by taking load off the power supply grid during peak demand periods.

- **Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.**

The water conserved by the project will be used by the farms in Belridge Water Storage District served by the canal system, and they will no longer need to replace the lost water by purchasing more water from northern California that is conveyed through SWP facilities, making that replacement water available for other water users or for environmental water flows in the Delta. SWP pumps in the Delta are considered by some to adversely alter Bay-Delta water conditions for fish and their habitat and/or cause predation or entrainment near or in the pumps' fish screens under certain water conditions. This has been the subject of many studies.

The species are subject to recovery and/or conservation plans under the Endangered Species Act. The proposed project will contribute to improving the status of the listed fish species by conserving Delta water. The US Fish & Wildlife Service has listed 54 different endangered or threatened species that 'Occur in or may be affected by Projects in the Sacramento/San Joaquin Delta' (the list is not attached due to space limitations).

- **Provide a description of the mechanism that will be used, if necessary, to pull the conserved water to the intended use.**

California has an open water market that other users can access to purchase replacement water and if not purchased it would flow through the delta and provide environmental benefits.

- **Indicate the quantity of conserved water that will be used for the intended purpose(s).**

All of the water conserved water (438 AF from lining District reservoirs and 438 AF from on-farm reservoirs) will be used for the intended purpose.

Project Benefits:

Please provide a detailed explanation of the project benefits and their significance.

- **Combating the Climate Crisis: Presidential Executive Order 14008: Tackling the Climate Crisis at Home and Abroad, focuses on increasing resilience to climate change and supporting climate-resilient development. For additional information on the impacts of climate change throughout the western United States, see: <https://www.usbr.gov/climate/secure/docs/2021secure/2021SECUREReport.pdf> .**

Please describe how the project will address climate change, including the following:

- **Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.**

Greenhouse gasses (that contribute to climate change) associated with energy generation will be reduced by the project as previously detailed.

- **Does this proposed project strengthen water supply sustainability to increase resilience to climate change?**

Yes, the project strengthens water supply sustainability because it conserves water and therefore increases resilience to climate change.

- **Will the proposed project establish and utilize a renewable energy source?**

No

- **Will the project result in lower greenhouse gas emissions?**

Yes (see Sub-criterion B.2 above)

- **Disadvantaged or Underserved Communities: E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged**

communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including the following:

- Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety through water quality improvements, new water supplies, new renewable energy sources, or economic growth opportunities.

The project does not directly serve a disadvantaged or historically underserved community. But it indirectly benefits the disadvantaged and historically underserved community of Lost Hills where many of the local farm workers live by helping to make their jobs more secure due to increased water supply reliability to farms in the Lost Hills area.

- If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.

The median household income in Lost Hills is \$34,875 (see <https://datausa.io/profile/geo/lost-hills-ca#:~:text=Households%20in%20Lost%20Hills%2C%20CA%20have%20a%20median%20annual%20income,across%20the%20entire%20United%20States.>

The median household income in California is \$ 75,235 (see <https://worldpopulationreview.com/state-rankings/median-household-income-by-state> Lost Hills' median income is 46% of California's.

- If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civil life.

2010 census data documents cited by Wikipedia say 97.6 % of Lost Hills' population is Hispanic or Latino (which are commonly considered as an underserved community).

- **Tribal benefits:** The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of federal tribal trust responsibilities. The President's memorandum "Tribal Consultation and Strengthening Nation-to-National

Relationships” asserts the importance of honoring the federal government’s commitments to Tribal Nations.

- Does the proposed project directly serve and/or benefit a tribe? Will the project increase water supply sustainability for an Indian tribe? Will the project provide renewable energy for an Indian tribe?

The project does not directly serve and/or benefit a tribe.

- Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?

No.

- **Other Benefits:** Will the project address water and/or energy sustainability in other ways not described above? For example:

- Will the project assist States and water users in complying with interstate compacts?

No.

- Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?

The project will benefit agriculture and may benefit environmental users as detailed above.

- Will the project benefit a larger initiative to address sustainability?

Yes. This project is an agricultural water use efficiency project. As indicated by the following web sites Agricultural Water Use Efficiency is a key part of the State and Federal government’s CAL FED Water Use Efficiency program to address water shortages and the long-term ecological health of the Bay-Delta region.

https://www.whitehouse.gov/wp-content/uploads/2021/05/calFed_fy22.pdf

<https://water.ca.gov/Programs/Water-Use-And-Efficiency/Agricultural-Water-Use-Efficiency>

- Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

The project will contribute in a small way toward preventing crisis and conflict for water on the State and Federal water projects in the Sacramento and San Joaquin River Basin which frequently has tension and litigation over water.

Criterion D—Complementing On-Farm Irrigation Improvements (Up to 10 points)

Describing in detail how they will complement on farm irrigation improvements eligible for NRCS financial or technical assistance.

- **If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following.** If BWSD is awarded the proposed grant from Reclamation, it will commit to working together with NRCS staff so the proposed project will complement on-farm improvements eligible for NRCS. Amy Rocha, District Conservationist in the NRCS' Bakersfield Service Center was contacted during the preparation of this application to continue discussions that began in 2022 about leveraging the Reclamation Grant, should it be awarded, for complementing on farm improvements eligible for NRCS assistance in LHWD and Kern County. A copy of e-mail conversations with her are included in **Attachment 10**. She suggested the NRCS promotion tasks that have been included in the grant application.
 - **Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.** Farmers and ranchers that receive water from BWSD are known to have very high on farm efficiencies and practice many efficient water management practices that are incentivized by NRCS programs. Information concerning planned and ongoing efficient water management practices is often not shared with BWSD staff directly by farmers/ranchers or NRCS staff but evidence of those practices and programs are readily apparent as described below.
 - **Provide a detailed description of the on-farm efficiency improvements.** There has been a wholesale conversion of nearly all irrigated lands in BWSD to micro-irrigation systems. Advanced irrigation management practices are widespread including use of soil moisture measuring devices, leaf stress monitoring, water budget irrigation scheduling, advanced soil and nutrient management practices, lining and piping of unlined water conveyance facilities and reservoirs. The District financially supports the mobile lab program through the Northwest Kern Resource Conservation District [Website](#) and BWSD growers are known to use those services, which have aided increased irrigation efficiencies and validated that high irrigation efficiencies are prevalent in the District. The District's largest grower, Wonderful Orchards, has been particularly engaged in efficient irrigation practices and has been at the forefront of advanced salinity and nutrient management research and practices. Wonderful Orchards has partnered for many years with the California Almond Board and the University of California's Cooperative Extension and their researchers plus extension staff to both research and promote advanced irrigation, salinity, and nutrient management practices in almond and pistachio orchards. (see: https://www.almonds.com/sites/default/files/content/attachments/1_nitrogen_management_and_budgeting_1.pdf and <https://www.mdpi.com/2571-8789/5/3/50/htm>).
 - **Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?** Records on

farmers/ranchers that have requested technical or financial assistance from NRCS for on farm efficiency projects in the area are kept by the NRCS Service Center in Bakersfield. A list of such farmers in BWSD is not kept by BWSD but was requested from the Bakersfield Service Center to aid in leveraging Reclamation’s proposed project funding. The Bakersfield Service Center declined to provide a list but rather suggested the district contact its growers individually. The District has made contact with its growers, but no responses have been received prior to submitting this application.

- **If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.** A review of NRCS California financial and technical assistance programs for on farm irrigation efficiency at <https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/programs/>, which found the following eligible programs:

NRCS Conservation Practice #	Practice
163	Irrigation Management Design
199	Conservation Plan
216	Soil Health Testing
378	Pond
428	Irrigation Ditch Lining
430	Irrigation Pipeline
436	Irrigation Reservoir HDPE lined
449	Irrigation Management
520 and 521	Pond Sealing or Lining
587	Structure for Water Control
620	Underground Outlet

While most of these practices are already widespread in BWSD they are not yet universal, and there are likely opportunities to do more. For example, there are about seventy privately owned reservoirs in BWSD and many are not believed to have an impermeable liner so there may be an opportunity for landowners that don’t to receive EQIP funding from NRCS to line them. Planning for and implementing advanced irrigation, salinity, and nutrient management practices is likely another opportunity for some farmers but that will need to be determined.

- **Applicants should provide letters of intent from farmers/ranchers in the affected project areas.** BWSD contacted owners of some of the reservoirs mentioned above to explore their interest in NRCS’ programs and is waiting for responses.

- **Describe how the proposed project would complement any ongoing or planned on farm improvement.**
 - **Will the proposed project directly facilitate the on-farm improvement? If so, how? For example, installation of a pressurized pipe through can help support efficient on-farm irrigation practices, such as drip irrigation.** Funding of BWSD's Reservoir Lining Project will help BWSD and NRCS' staff promote district and on-farm efficiency programs in a manner that has not previously been done. HDPE lining of the district's reservoirs will help further promote the use of impervious linings in reservoirs that currently do not have them, including on-farm reservoirs. It will also help BWSD and NRCS to promote their water conservation programs.
 - **Will the proposed project complement the on-farm project by maximizing efficiency in the area? If so, how?** This question was not answered because the above question was answered instead.
- **Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.** Since water lost to seepage and excessive deep percolation are known to be lost to salty shallow groundwater and much energy is involved in pumping water used on farm, water and energy conservation benefits would be expected to result from funding the NRCS Conservation Practices described above.
 - **Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.** Since it is not known which farmers/ranchers nor projects would result in being funded an assumption was made that 15% of the on-farm reservoirs (about 10) would be lined as a result of the NRCS promotion. Since the average on-farm reservoir is about one acre in area the 10 acre area matches the combined size of BWSD's two reservoirs. Therefore, savings from the NRCS promotion would be expected to be similar to savings from lining BWSD's reservoirs..
- **Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded projects.** Figure 1 is a map of LHWD's Service Area. This map was also provided to the District Conservationist of the NRCS's Bakersfield Service Office.

If BWSD is awarded the proposed grant from Reclamation, it will commit to working together with NRCS staff so the proposed project will complement on-farm improvements eligible for NRCS. Amy Rocha, District Conservationist in the NRCS' Bakersfield Service Center was contacted during the preparation of this application to continue discussions that began in 2022 about leveraging the Reclamation Grant, should it be awarded, for complementing on farm

improvements eligible for NRCS assistance in Lost Hills Water District and BWSO. A copy of the e-mail correspondence with her is included as **Attachment 10**. She suggested the NRCS promotion tasks that have been included in the Project's scope of work. The project will complement NRCS' assistance programs for on-farm water conservation including the EQIP Program which includes financial incentives for lining on-farm reservoirs and ditches. There are about seventy on-farm reservoirs that are mostly unlined that could benefit from lining, so promoting the EQIP incentives for lining on farm reservoirs would be expected to result in growers lining some of the reservoirs, increasing the Project's water conservation, energy savings, and GHG reductions.

Criterion E. Planning and Implementation (Up to 8 points)

Subcriterion E.1 - Project Planning.

Does the project have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaption strategy identified in a completed WaterSmart Basin Study?

- **Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.**
- **Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).**
- **If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g. a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes).**

The area is within the Sacramento-San Joaquin WaterSMART Basin study (see https://www.usbr.gov/watersmart/bsp/docs/finalreport/sacramento-sj/Sacramento_SanJoaquin_TechnicalReport.pdf). The project supports the management actions of Regional Self-Reliance by conserving water supplies. It also supports the Water Action Plan (California Water Action Plan) as described below.

Belridge Water Storage District 2020 Agricultural Water Management Plan

BWSO maintains an Agricultural Water Management Plan that was most recently updated in 2020 (see <https://www.bwsd.org/awmp/>). Lining distribution systems to reduce seepage is listed as an Efficient Water Management Practice in Section VII of the plan.

Kern County Integrated Regional Water Management Plan

**Belridge Water Storage District
USBR WEEG Application**

BWSD is a member of the Kern Integrated Regional Water Management Group, which adopted the Kern Integrated Regional Water Management Plan (IRWMP) in 2011 and most recently updated it in 2020 (see <http://www.kernirwmp.com/documents.html>). The proposed project was not submitted during the project prioritization that was done for that plan in 2019, but another canal lining project, the CVC Extension Lining Project – Pool No. 8, was submitted and highly ranked on the Tier 1 Project Prioritization List. The proposed project is also consistent with several goals and objectives of the Kern IRWMP, as shown in **Table 1**.

Table 1: Kern IRWM Plan Objectives Addressed by Project

Kern IRWMP Objectives	BWSD 415 and 500 Reservoir Lining Project
Increase Water Supply	
Through cooperation and collaboration with other regions restore water supplies to levels that will mitigate for water lost from the Region and eliminate overdraft	X
Pursue and implement cost effective water use efficiency programs	X
Increase water storage capacity in the region by increasing recharge acreage and expanding groundwater banking programs before all prime recharge land has been developed 8,000 recharge acres as soon a practicable	
Increase/augment water supplies to meet region demands (e.g., M&I, agricultural, environmental) by 2050.	X
Improve Operational Efficiency	
Optimize local management of water resources to improve water supply reliability over the planning horizon	X
Improve Water Quality	
Identify and preserve prime recharge areas in the Kern fan area and other areas	
Improve water quality for DACs and the watershed over the planning horizon	
Continue to provide drinking water that meets or exceeds water quality standards; and support efforts to attain appropriate standards throughout the planning horizon	
Maximize the use of lesser quality water for appropriate uses (landscaping, certain ag crops, “aesthetic” projects) throughout the planning horizon	
Promote Land Use Planning and Resource Stewardship	
Increase educational opportunities to improve public awareness of water supply, conservation, and water quality issues throughout the planning horizon	
Improve and coordinate integrated land use planning to support stewardship of environmental resources, such as local rivers and streams and the Kern Fan, and integrate with habitat conservation plans and other ongoing planning efforts from this point forward	
Preserve and improve ecosystem/watershed health throughout the planning horizon	
Improve Regional Flood Management	
Improve regional flood management by addressing preparedness, response, and post flood actions throughout the planning horizon	
Identify and promote innovative flood management projects to protect vulnerable areas	
Plan new developments to minimize flood impacts from this point forward	

California Water Plan

The California Water Plan was most recently updated 2018. The project is consistent with the Management Objective to Reduce Water Demand through Agricultural Water Use Efficiency.

Subcriterion E.2 Readiness to Proceed.

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.2. Application Content; this section should be focused on a summary of the major tasks to be accomplished as part of the project.
- Describe any permits that will be required, along with the process for obtaining such permits.
- Identify and describe any engineering or design work performed specifically in support of the proposed project.
- Describe any new policies or administrative actions required to implement the project.
- Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected timeline for environmental and cultural compliance discussed with the local Reclamation Regional or Area Office?

Yes, Rain Emerson with Reclamation's Area Office, was contacted by Dena Giacomini of Provost & Pritchard. They discussed the project and NEPA compliance process on July 27th, 2022. The scope of work related to environmental compliance reflects the conversation they had.

As detailed in the Project's Scope of Work in the Technical Project Description section and shown in the Project Schedule in **Attachment 4**, which indicates milestones, the project implementation plan includes the following major tasks:

Task 1 - Administration: Tasks associated with administering the project and grant throughout the project.

Task 2 - Reporting: Completing the project's semi-annual and Final reports.

Task 3 – Land Purchase/Easement: Documenting that BWSD owns the land at the reservoir sites and no land purchase or easement work is needed.

Task 4 - Assessment and Evaluation: Geotechnical engineering for the project, primarily to specify work needed to prepare the subgrade under the HDPE liner.

Task 5 - Final Design: Design and preparation of project plans and specifications for bidding and

building the project by the District's consulting Civil Engineer.

Task 6 - Environmental Documentation: Completing the CEQA and NEPA processes along with required studies, consultations, and tribal notification. The District's consulting environmental specialists will work with involved State and Federal agencies to assist the District through these processes. This task will be prioritized by the District for early completion in 2023.

Task 7 - Permitting: The SWPPP and DCP (routine permits) would be obtained by the District's consulting Civil Engineer and no major regulatory hurdles are expected to delay completion of the project.

Task 8 - Construction Contracting: Conduct public bidding process and award contract to winning bidder.

Task 9 - Construction: Project construction

Task 10 - Environmental Compliance/Mitigation/Enhancement: Field reviews and compliance documentation in accordance with the SWPPP, DCP, and CEQA/NEPA mitigation measures.

Task 11 - Construction Administration: Administration of the construction process by the design engineer.

Task 12 – Public Outreach: Outreach activities to publicize the project.

Task 13 – Performance Measures Validation: Validating water and energy conservation plus greenhouse gas reduction of the project.

Criterion F—Collaboration (Up to 6 points)

Please describe how the project promotes and encourages collaboration. Consider the following:

- **Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?**
- **What is the significance of the collaboration/support?**
- **Will this project increase the possibility/likelihood of future water conservation improvements by other water users?**
- **Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).**

The project is widely supported, as the benefits of water and energy conservation are recognized throughout the Kern County community and California. A letter of support from

the Kern Integrated Regional Water Management Group is included as **Attachment 9**. Board members of BWSD (see <https://www.belridgewsd.com/board-of-directors/>) represent the largest landowners in the District. They strongly supported and unanimously approved preparation of this grant application and the Project Funding Plan.

Subcriterion G Additional Non-Federal Funding (Up to 4 points)

Provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:

$$\begin{array}{l} \text{Non-Federal Funding} = \frac{\$856,819}{\$1,356,819} = 63\% \\ \text{Total Project Cost} \end{array}$$

Criterion H Nexus to Reclamation (Up to 4 points)

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider the following:

- **Does the applicant have a water service, repayment, or O&M Contract with Reclamation?**

BWSD does not have any of those contracts directly (see answer to next question).

- **If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or any other contractual means?**
 - KCWA who supplies water to BWSD obtains annual contracts for Friant Division Central Valley Project (CVP) floodwater (Section 215 water) from Reclamation. This water is delivered to water banks that BWSD participates in.
 - KCWA frequently performs transfers and exchanges with other water agencies for Friant CVP water
 - Friant CVP water is delivered to the Kern County area through a series of facilities including the Friant-Kern Canal of the Friant CVP Division.

- **Will the proposed work benefit a Reclamation project area or activity?**

Yes. As detailed above, water conserved from the Delta provides a direct benefit to Reclamation's Central Valley Project

- **Is the applicant a tribe?**

No. The project does not involve any Native American Tribes. Tribes will be consulted during the CEQA Initial Study.

ENVIRONMENTAL & CULTURAL RESOURCES COMPLIANCE

- **Will the project impact the surrounding environment? 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 project is not expected to effect the surrounding environment because the work will be completed within existing reservoir footprints using existing access roads and parking areas. The project involves the removal of the existing concrete lining and installation of the new HDPE lining. There will be no modification or installation of turnouts, gates, or other infrastructure. Based on our knowledge of the surrounding area, the project is within a highly agricultural setting. The lack of appropriate vegetation and the heavily disturbed area offers little potential to provide habitat or support wildlife populations, and very little vegetation coverage precludes the area from being a viable corridor between nearby habitats.

Air

- The project involves the emptying and lining of two reservoirs, which would require minimal equipment. A temporary increase in emission will occur due to construction equipment use for liner prep and installation. However, the effects would be negligible, and air quality would return to pre-project conditions upon project completion.

Water

- The project will result in an increase in water quality and reliability. The existing system loses water through seepage and loss into the highly saline groundwater, making the water unusable. The lining would prevent water loss and canal breaches and provide reliable water for storage.

Habitat

- The project area includes continuously maintained reservoirs and a canal system which is surrounded by agricultural fields. The reservoirs have not been known to serve as waterfowl habitat, and the surrounding environment does not provide resources to sustain wildlife or vegetation communities. Further, the project will not involve ground disturbance or vegetation removal. Project activities will occur solely within the footprint of the existing reservoirs. There will be no expansion, modification, alteration, or removal of any existing facilities, and construction only involves relining the reservoirs.
- The project area is made up of bare ground, dirt access roads, and reservoirs, surrounded by crop fields. Sparse, non-native grasses and shrubs can be found adjacent to the reservoirs. No vegetation will be removed as part of project activities. All work will occur within the existing reservoirs.

Under no circumstances will any ground-disturbing construction activity take place before environmental and cultural resources compliance is complete and Reclamation explicitly authorizes work to proceed.

- **Are you aware of any species listed or proposed to be listed as a Federal endangered or threatened species, or designated Critical Habitat in the project area? If so, would they be affected by any activities associated with the proposed project?**

An assessment of the *Information for Planning and Consultation (IPaC)* United States Fish and Wildlife Service (USFWS) federal database for listed species indicates that federally endangered and threatened species are absent from the project area. Similarly, this database indicates that there is no designated Critical Habitat in the project area. The existing infrastructure and surrounding area of the project does not provide suitable habitat that could support wildlife including listed species. To prevent any effects to unlisted wildlife that may be found in the area, the reservoirs will be lined with a textured geo-membrane to allow for easier exit in the event that wildlife fall into the reservoir.

- **Are there wetlands or other surface waters inside the project boundaries that potentially fall under Federal Clean Water Act jurisdiction as “waters of the United States”? If so, please describe and estimate any impacts the project may have.**

The *National Wetlands Inventory* and the *United States Environmental Protection Agency WATERS GeoViewer* indicates that wetlands, other surface waters, and any other water resources are absent from the project area. The area around the existing reservoirs is routinely maintained. Areas outside of the reservoir boundary will not be disturbed. The project involves only the lining of the two reservoirs and the use of existing access roads. There will be no ground disturbance, alteration, or modification of the existing infrastructure, and all project activities will be restricted to the boundaries of the two reservoirs.

- **When was the water delivery system constructed?**

The water delivery system was constructed in the 1968.

- **Will the 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 existing reservoirs are comprised of a clay soil bottom and asphalt slopes. The project intends to install a HDPE liner placed over a prepared subgrade in the existing reservoirs with an anchor trench around the reservoirs’ perimeter. There will be no modification of or activities to any existing infrastructure, and there will be no additional ground disturbance beyond that of liner preparation and placement.

- **Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?**

Section 106 of the National Historic Preservation Act of 1966 (NHPA) indicates that buildings, structures, or features over 50 could be eligible for listing on the National Register of Historic Places database. Although consultation with the database provides no records of Historic Places in the project area, the canal and reservoir infrastructure, built in 1968, may be eligible for listing due to age. However, the project does not include ground disturbance, modification of

any facilities, and will not alter the existing profile of the area. Therefore, no effects to any future listings are anticipated.

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

No known archeological sites exist in the proposed project area. However, the project does not include ground disturbance or modification of any facilities and will be contained within the boundaries of the existing reservoirs. Existing access roads and parking areas will be used and no new points of access will be constructed.

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

The Lost Hills community is considered a Disadvantaged Community (DAC) as identified on the California Public Utilities Commission website. The project is not anticipated to have any adverse effects on this community. Rather, this project seeks to address environmental injustices resulting from an overutilization of groundwater in this community that has caused an increase in salinity of the existing groundwater resources. Installation of the reservoir liner will reduce the amount and water loss to seepage in an area with already limited water resources. The additional water may be available to the predominantly farming community and reduce the burden of water scarcity and water quality.

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

Tribal lands and Indian sacred sites are absent in the project area according to the *Advisory Council on Historic Preservation*. Project activities will not involve ground disturbance or alteration, and there will be no effects to any unanticipated sacred or tribal areas. The work will occur within the two existing reservoirs

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

The existing facility is under continuous operation and maintenance and vegetation growth is controlled and abated. The United States Department of Agriculture *National Invasive Species Information Center* developed Best Management Practices to Prevent the Introduction and Spread of Invasive Species, and the project will employ these measures to reduce the introduction and spread of invasive weeds. In addition, the improved water reliability may help to prevent land fallowing in dry years when noxious and non-native species could spread onto farmland and adjacent areas.

REQUIRED PERMITS OR APPROVALS

The anticipated permits and approvals needed for the project are described below. Both BWSD and their engineering consultant, Provost & Pritchard Consulting Group, have experience in

securing these permits for other projects.

This project will require the approval of environmental documentation pursuant to both California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Local permits that may be required include a Dust Control Plan from the San Joaquin Valley Air Pollution Control District, and an approved Stormwater Pollution Prevention Plan from the Regional Water Quality Control Board. No State or Federal facilities will be modified as part of the project. No other local, State or Federal permits are anticipated to be necessary, but they will be investigated further through the NEPA process.

OFFICIAL RESOLUTION

A resolution was adopted by the BWSD Board of Directors on June 29, 2022, authorizing the General Manager to submit this application, to fund the proposed cost share, and to execute an agreement with the USBR for a grant. A copy of the resolution is included as **Attachment 5**.

FUNDING PLAN AND LETTERS OF COMMITMENT

- **A description of how the applicant will make its contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).**

Non-reclamation project costs will come entirely from BWSD. There are no other project partners. The District has \$16 million in cash and investments to draw from (see the most recent financial statement in **Attachment 6**). Adequate funds will be budgeted for 2023, and a portion of the cash and investments will be reserved for future cost share in 2024. The Board is committed to funding the project as evidenced by the adopted Board Resolution (**Attachment 5**) and signed Assurance forms.

- **Describe any in-kind costs incurred before the anticipated project start date that the applicant seeks to include as project costs.**

There will be in-kind costs for District staff salaries, but they will not seek reimbursement for them, nor count them as cost share.

- **What project expenses have been incurred**

Primary expenses incurred to date include preliminary project planning that helped to define the project scope, benefits, costs, and potential environmental impacts. The District will not seek reimbursement for those planning costs.

- **Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.**

There will be no funding partners.

- Describe any funding requested or received from other Federal partners.

No other funding has been requested from other Federal Partners.

- Describe any pending funding requests that have not yet been approved and explain how the project will be affected if such funding is denied.

No other funding requests have been made.

Table 2: Summary of non-Federal and Federal Funding Sources

Funding Source	Funding Amount	Percentage
Non-Federal Entities		
Belridge Water Storage District	\$856,819	63%
<i>Non-Federal Subtotal:</i>	<i>\$856,819</i>	<i>63%</i>
<i>Other Federal Entities</i>	<i>\$0</i>	<i>0%</i>
<i>Requested Reclamation Funding:</i>	<i>\$500,000</i>	<i>37%</i>
<i>Total Project Funding:</i>	<i>\$1,356,819</i>	<i>100%</i>

Table 3: Funding Group I Funding Request

Funding Group I Funding Request		
	Year 1 (FY 2023)	Year 2 (FY 2024)
Belridge Water Storage District	\$300,000	\$200,000

BUDGET PROPOSAL

Attachments 7 and 8 includes a detailed construction cost estimate and consultant cost estimate for the project, respectively.

Table 4: Funding Sources

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	63%	\$856,819
Reclamation Funding	37%	\$500,000
Other Federal Funding	0%	\$0
Totals	100%	\$1,356,819

Table 5: Project Budget Table

Budget Item Description	Computation		Recipient Funding	Reclamation Funding	Total Cost
	\$/Unit	Quantity			
<i>Salaries and Wages</i>	N/A	N/A	\$ 0	N/A	N/A
<i>Fringe Benefits</i>	N/A	N/A	\$ 0	N/A	N/A
<i>Travel</i>	N/A	N/A	\$ 0	N/A	N/A
<i>Equipment</i>	N/A	N/A	\$ 0	N/A	N/A
<i>Supplies/Materials</i>	N/A	N/A	\$ 0	N/A	N/A
<i>Contractual/Construction</i>					
Reservoir Lining Project	See Attachment 7		\$705,000	\$410,000	\$1,115,000
<i>Other – Consultants</i>					
Reservoir Lining Project	See Attachment 8		\$151,819	\$90,000	\$241,819
Total Direct Costs					
Indirect Costs – 0%	\$0		\$0	\$0	\$0
Total Project Costs			\$856,819	\$500,000	\$1,356,819

N/A = Not applicable

BUDGET NARRATIVE

A project budget was prepared by Provost & Pritchard Consulting Group in accordance with engineering standard cost estimating procedures.

Cost information was obtained from the following:

- Bid canvasses for similar projects in the area
- Contractors
- Caltrans Contract Cost Data Book
- Geotechnical sub-consultant

- Provost & Pritchard's past project experience

The budget includes an engineer's opinion of probable cost along with estimates of consultant costs for administration, planning, design, engineering, environmental documentation, construction contracting, environmental compliance, and construction administration.

The cost estimate included in this application is believed to be reasonable because the budget was based on actual costs from recent similar projects completed within the region.

Salaries and Wages. No reimbursement will be sought for BWSD salaries and wages for their time on the project, as they are covered under the District's operating budget.

Fringe Benefits. No reimbursement will be sought for BWSD fringe benefits associated with the project, as fringe benefits are covered under the District's operating budget.

Travel. Travel costs for contractors and consultants are included in the Construction/Contractual categories based upon IRS allowed rates (\$0.625/mile). Travel will be required to and from the project site or the BWSD office. No District employee travel costs will be sought for reimbursement. The cost estimate does not include any per diem or lodging costs.

Equipment. No major equipment will need to be purchased for the project. It is anticipated that all the heavy construction equipment used in this project will be supplied by the awarded contractor.

Materials and Supplies. No materials or supplies are proposed to be acquired for the project, except for those that are within the Contractual/Construction cost category, such as liner, fencing, etc.

Contractual/Construction. This category includes cost for engineering consultants, environmental consultants, and construction contractors. The rates shown for all contractual categories are for budgetary purposes; the actual rates in effect at the time the work is performed will be charged to the project. All surveying and construction estimates are based on prevailing wages.

Engineering Consultants. Engineering consultants will perform project design, geotechnical investigations, and construction related items (construction staking, construction review and administration, construction testing, and performance measure validation).

Environmental Consultants. CEQA, NEPA, cultural resources, and biological consulting costs for the project that include additional biological and cultural resources surveys. Permit fees are included for the Stormwater Pollution Prevention Plan, Dust Control Plan and Indirect Source Review. The value of the fees was estimated based on the size of the project, and a consultant's experience with these permit fees on other projects.

Construction Contractor. BWSD plans to hire construction contractors to perform the project construction and will select them according to their competitive bidding process. Provost & Pritchard estimated construction quantities on a fifteen percent (15%) design. Costs were estimated using the bid estimates from similar projects, preliminary budget data from a local

contractor, Caltrans Contract Cost Data Book (2010). Construction costs are estimated to be \$1.1 million (as itemized in **Attachment 7**). The preliminary design is generally based on the assumed final design. At this stage of design there are still some unforeseen factors related to construction, therefore a 20% contingency was included for the project.

Administrative Costs. Administrative costs are included in the Contractual/Construction category. The Consultant Cost Estimate (**Attachment 8**) shows that grant administration is estimated to be \$29,240, which is about 2% of the total project budget. The BWSD is the lead agency for the project. BWSD staff have administered several similar projects and believe that their estimate of administrative expenses is accurate.

Land Purchase and Easements. No land purchases or easements will be required for the project.

Environmental and Regulatory Compliance. Environmental and regulatory costs for the project are included in “Contractual/Construction” category as the work will be done by consultants. Related tasks in the consultant fee estimate include Task 6 – Environmental Documentation, and Task 10 –Environmental Compliance/Mitigation/Enhancement. These costs are about 5% of the total project cost. No major environmental issues are likely based on field review. This will also cover SWPPP/DCP monitoring and reporting as well as a biological pre-construction review and tailgate training with the Contractor. This task also includes \$12,000 for USBR costs to help comply with NEPA.

Reporting. Periodic (semi-annual) and a draft and final project report will be prepared by District staff and its consulting engineer. Consulting engineer’s costs for reporting are included in “Contractual/Construction” category and are based on their experience with other USBR grants. District costs for reporting will not be sought for reimbursement, as those costs are included in the District’s operating budget.

Contingencies. The construction cost estimate includes a 20% contingency. This contingency is considered appropriate for the feasibility-level design (15% plans) and accounts for uncertainty in dimensions, uncertainty in design, allowance for neglected items, and uncertainty in regulatory requirements. No contingencies are considered necessary for the engineering fees.

Indirect Costs. No indirect costs are anticipated.

Post Construction Monitoring. Costs are not included for post-construction monitoring since they will take place after the project is completed and the grant contract is finalized. BWSD already performs monitoring in the canal and monitoring the effectiveness of the project will require little additional effort.

Post Construction Maintenance. BWSD will be responsible for post construction maintenance. BWSD already maintains the reservoirs and expects that maintaining HDPE liners will require less effort since asphalt slope protection and soil liners require frequent maintenance for erosion and have a higher risk of canal breaching.

Other Expenses. No other expenses are anticipated.

Total Cost. The total project cost is \$1,356,819 with a requested grant of \$500,000 and cost share of \$856,819.