Deutsch Domestic Water Company

Grant Proposal

for

Conservation Measures & Renewable Energy Improvements

July 28, 2022

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Executive Summary

28 July 2022
Deutsch Domestic Water Co Inc (DDWC)
Crawford, Delta County, Colorado.

DDWC is proposing technological improvements and customer incentives program to continue implementation of water savings measures in its recently-published Drought Management Plan. Proposed upgrades to DDWC's system include installation of photovoltaic solar arrays at its pumphouse and four booster stations, upgrade all water meters to advanced metering infrastructure (AMI) read meters, and install a supervisory control and data acquisition (SCADA) networking system to gather, analyze, and manage the data. Additionally, for its users, DDWC proposes to establish incentive programs to encourage homeowner water efficiency improvements. It would offer rebates for EnergyStar- and WaterSense-certified high-efficiency appliances and fixtures. It would also offer rebates for water efficient landscaping improvements such as turf removal and WaterSense-certified irrigation heads and controllers.

§D. Application and Submission Information

1.1 Mandatory Federal Forms and Attachments

1.1.1 Mandatory Federal Forms

- SF-424 Application for Federal Assistance.
- SF-424A Budget Information – Construction Programs (this form is acceptable for both construction and non-construction projects)
- SF-424D Assurances – Construction Programs
- Project Abstract Summary (OMB Number 4040-0019)
- SF-LLL Disclosure of Lobbying Activities (if applicable)

1.1.2 Attachments

- GBRT Support Letter
- Letter of Commitment from Pritchett Farm
- Gantt Chart
- Badger AMI Meters Product Data
- Budget Proposal Spreadsheet

1.2 Project Location

The Deutsch Domestic Water Company (DDWC) is a Special Purpose Water Carrier Company serving the rural area southeast of the Town of Crawford, in Delta and Montrose Counties, Colorado. Crawford had approximately 403 people during the 2020 census and is located about 72 miles southeast of Grand Junction. Figure 1, below, shows its distribution lines current plan

view. The proposed project will construct additional storage tanks along these lines. A feasibility study, conducted as part of the proposed project, will be used to determine locations on the lines where they would provide the best functionality. General project coordinates are 38.425000°N, 107.350244°W.

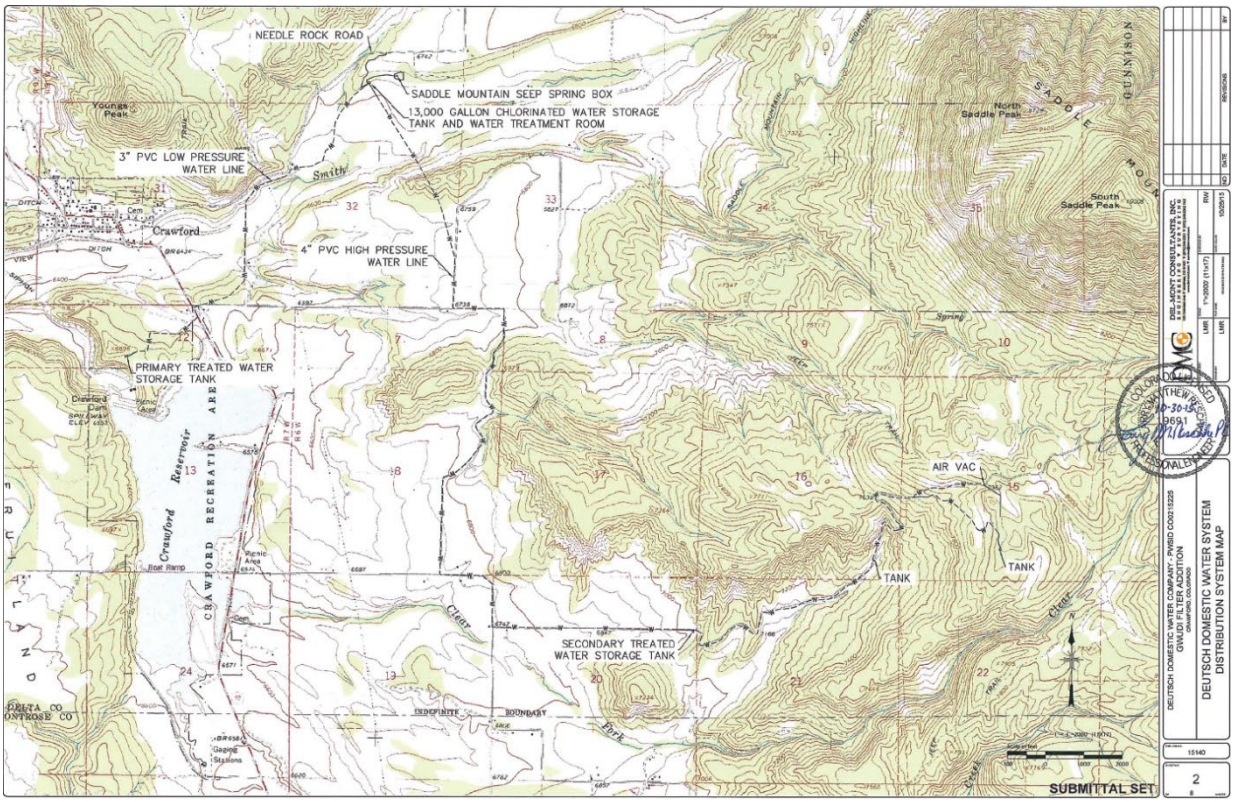

Figure 1: The DDWC system distribution map, dated 28 October 2015.

1.3 Technical Project Description

This proposed project aims to enhance DDWC's system efficiency by leveraging automation technology, solar power, and customer incentives programs. The project will work in conjunction with another project for which DDWC has applied. This proposal has seven distinct objectives listed below.

1.3.1 Replace Unlined Channel with Pipe

DDWC proposes to replace approximately half a mile of existing open channel with an underground PVC pipe, sized to transport 1.0 cfs. The pipe would carry water to new storage being constructed in another project. After DDWC collects its allotment, the excess would be diverted to benefit a wetland and two downstream agricultural irrigation users.

The channel, called Young Ditch, was excavated 100 years ago with the intent to divert water from Smith Fork for agricultural irrigation. Figure 2, below, shows its path. It is a small, highly irregular, unmaintained channel with heavy vegetation to the point where it's prone to blockages.

It begins at a headgate structure on Smith Fork which is usually set to let in between 0.25 to 0.50 cfs.

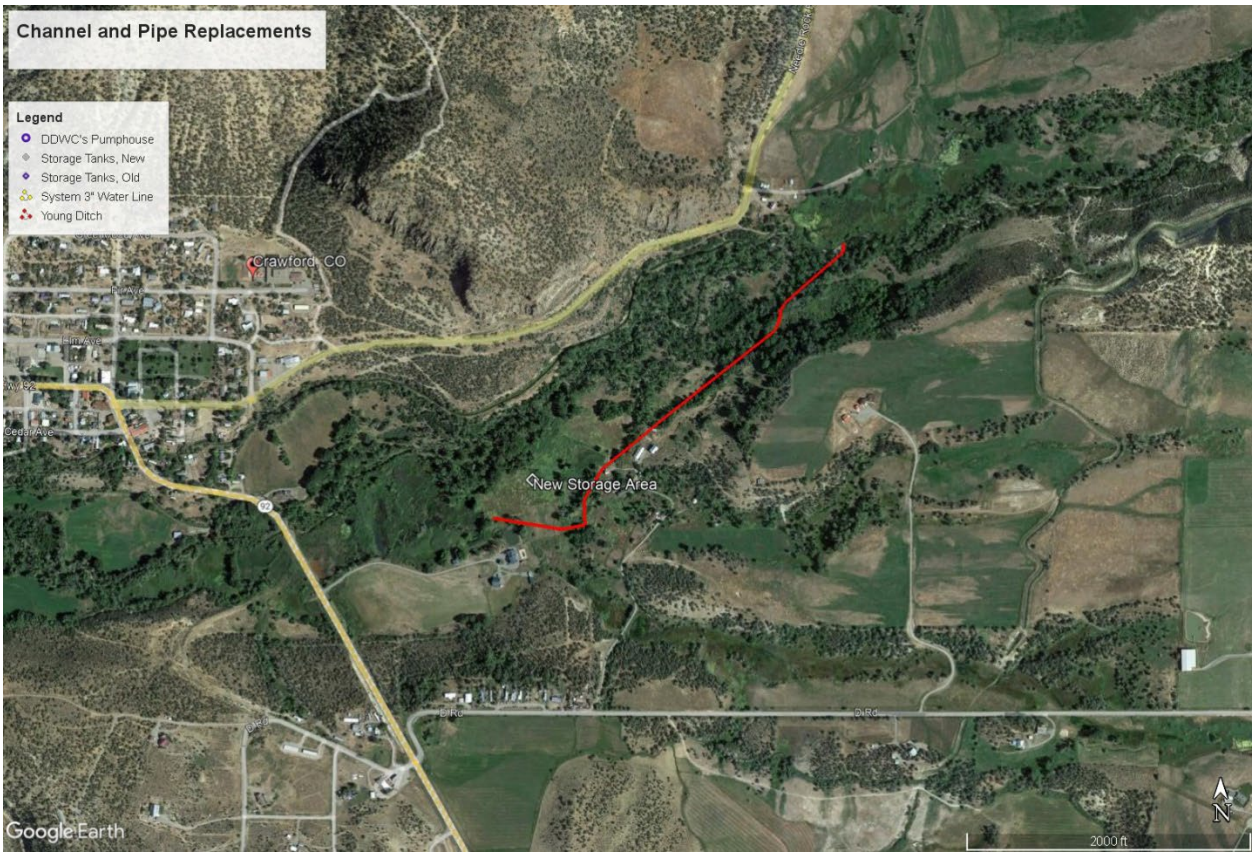

Figure 2: Young Ditch's path shown in red.

The proposed pipe is believed to be an improvement for all users along the ditch. There are no users drawing from the half-mile segment to be replaced. The project could reduce seepage and evaporation losses over that stretch. DDWC's proposed 1.0 cfs design flow is meant to meet its proposed raw water storage needs plus benefit the downstream wetland and farmers.

1.3.2 Municipal Metering

DDWC proposes replacement of 150 manual read meters with AMI-read ones. Additional flow sensors will be added on the system side at each pumping station, just before storage tank groups, where storage tank groups discharge back into the system, and at overflow pipes leaving from storage tanks. Automated water level meters will additionally be added to each storage tank, weir, the treatment basin, and the spring box.

A SCADA system will also be installed to collect and analyze the data. It will be leveraged with the AMI meters to provide real-time analysis of customer data routines for anomalies. Customers will be sent a notification if use patterns suggest they may have leaks, or if irrigation

during restricted periods of the drought management plan are detected. Supply system sensors will also be monitored. This will enable central management of the entire system's data.

1.3.3 Irrigation Flow Measurement

Young Ditch was originally constructed about 100 years ago with the intent to provide irrigation water to farmers downstream. Lack of maintenance, blockages, drought conditions over the last few decades, and ordinary transport challenges have resulting in the farmer relying more heavily on municipal water. For last 5 years, the Young Ditch's headgate has been limited to about 0.5 cfs entering the channel to supply the two farms on the southern end.

To be confirmed Young Ditch decreed water rights:

- Murphy 0.25 cfs
- Pritchett 0.25 cfs
- DDWC 0.25 cfs
  Total 0.75 cfs

- Understand 0.25 cfs was sold from a Young Ditch farmer to another area farmer for receiving the water via a different ditch.
- DDWC proposes designing the pipeline to be capable of transporting 1 cfs from the head gate to its storage tanks with provision for allowing some water to continue flowing down the open ditch for habitat purposes.

DDWC estimated that Young Ditch was originally built to transport about 1.0 cfs. Therefore, Task #1's (¶1.3.1) proposed pipe will be designed around a 1.0 cfs goal. If DDWC collects 0.25 cfs under its water rights, and another 0.25 cfs is used to sustain original flows to the wetland, then that leaves about 0.5 cfs (184 AFY) to be diverted to the farmers for irrigation.

1.3.4 Turf Removal

DDWC's Drought Management Plan recommended incentivizing homeowners to remove grass lawns in favor of desert landscape or artificial turf. This is proposed under this grant application. It is additionally recommended that the agreement include stipulations in any real estate sales for new buyers to not reinstall turf.

1.3.5 Smart Irrigation Devices

Promoting desert landscapes and landscape irrigation measures that create water savings by reducing outside water usage by removing turf, installing smart irrigation controllers, and installing high-efficiency sprinkler heads.

1.3.6 High-Efficiency Indoor Appliances and Fixtures

Establishing an incentives program for the installation of EnergyStar-certified high-efficiency indoor appliances and WaterSense-certified fixtures to create water savings.

1.3.7 Solar Photovoltaic Power

Installing 5 to 20 kW of solar PV capacity, along with potential battery storage, at each of its five pumping stations under a net metering agreement with the local utility. The solar systems to be designed and sized to meet 100% of our pumping system energy demand from available solar, potential battery storage, and/or the local utility under a net metering agreement with excess offered to help the local utility meet power supply needs. Solar energy will also be used to power secondary systems where practical. Such as site lighting, system sensors, and security monitoring at the pumping stations and storage tanks (new and old).

1.4 §E.1 Evaluation Criteria

1.4.1 Evaluation Criterion A—Quantifiable Water Savings (28 points)

1.4.1.1 Describe the amount of estimated water savings.

Water savings estimates for the seven proposed tasks are shown on Table 1, below. It estimates a total 75 AFY possible savings.

Table 1: Summary total of estimated water savings for the seven tasks proposed under this grant application sums to 167 AFY.

DDWC Conservation Measures		Est Savings
Item	**Description**	(AFY)
1.00	**Replacing Unlined Channel with Pipe**	
1.01	New Young Ditch Pipeline	17
1.02	Making Full Use of DDWC Irrigation Rights	92
	Subtotal	**109**
2.00	**Municipal Meters**	
2.01	Badger AMI System	5
2.02	SCADA System	2
	Subtotal	**7**
3.00	**Irrigation Flow Measurement**	**38**
4.00	**Turf Removal**	**2**
5.00	**Smart Irrigation Devices**	**7**
6.00	**High Efficiency Appliances & Fixtures**	**4**
7.00	**Solar PV**	**0**
	Total	**167**

1.4.1.2 Describe current losses:

a. Explain where current losses are going.

Current domestic water losses are primarily from outside uses to the ground, inefficient home appliances and fixtures lost to septic systems, and unused irrigation water.

About 80% of DDWC's customers are on septic systems. And most employ irrigation systems, whether for small lawns or agricultural activities. Consequently, DDWC's distribution system experiences usually high losses to diffuse outdoor land application. Consequently, much water is lost to evapotranspiration and percolation, with little returning to the river system. For DDWC, the most promising approach to water conservation is improving efficiency for it and its customers. Thereby reducing the volume taken into the usage cycle in the first place, and lessening the system's burden on Smith Fork tributary.

b. If known, please explain how current losses are being used.

Most domestic water is lost to diffuse land application and does not realize significant subsequent reuse.

c. Are there any known benefits associated with where the current losses are going?

The Young Ditch does drain into a wetland that drains back to the Smith Fork. The proposed plan includes provision of some overflow water to continue its support.

1.4.1.3 ***Describe the support/documentation of estimated water savings:***

(USGS Geological Map) A geologic map of the area published by the USGS was used to determine the Young Ditch areas geological makeup.

Noe, David C., and Alexander T. Klink. *Geological Map of the Crawford Quadrangle, Delta and Montrose Counties, Colorado*, vol. 1:24,000, U.S. Geological Survey, 2015. https://ngmdb.usgs.gov/Prodesc/proddesc_104648.htm.

(NRCS Web Soil Survey) The NRCS web soil survey database was used to obtain a hydraulic conductivity value and description of soils in the area.

"Web Soil Survey.", 2 Sep, 2021, https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

(NRCS Lawn Irrigation Guide) Published guidance from the NRCS recommends one-inch per week watering for a healthy lawn. DDWC converted this to a per-unit area rate. It assumed 24 inches applied over six months giving an approximate rate of 2 AFY/acre.

Ogle, Dan e. a. *Lawn Irrigation Guide.* Natural Resources Conservation Service, Washington, D.C. https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmsbr5464.pdf

(EnergyStar) Published data and/or specifications on the EnergyStar website provided potential water savings percentages for appliances.

USEPA, and USDOE. "Energy Star." https://www.energystar.gov/.

(USEPA WaterSense) Published data from the USEPA's WaterSense website provided potential water savings percentages for fixtures and irrigation devices.

USEPA. "WaterSense.", 21 Jul, 2022, https://www.epa.gov/watersense.

(Water Research Foundation) A report from the Water Research Foundation (WRF) breaks down average household water uses into percent per device. It was used to convert published EnergyStar and WaterSense upgrades into savings percent per households.

DiOrio, William B. et al. Residential End Uses of Water, Version 2 Executive Report. Water Research Foundation, 2016. https://www.waterrf.org/research/projects/residential-end-uses-water-version-2

(Deutsch Domestic Water Company) DDWC's recently-published drought management plan concluded a number of performance enhancements and drought response measures that could significantly conserve its water supply while also ensuring customer's needs are met. This grant would aid in its implementation stage for a number of these measures.

Drought Management Plan. Deutsch Domestic Water, 15 Jul 2022. https://www.deutschwater.com/_files/ugd/f3a344_3c8800ea7dbd46b2b9f5365ef9d87947.pdf

1.4.1.4 Please address the following questions according to the type of infrastructure improvement you are proposing for funding.

1.4.1.4.1 *Replace Unlined Channel with Pipe*

a. How has the estimated average annual water savings that will result from the project been determined?

Annual savings is assumed to be 100% of the calculated losses because DDWC is proposing to replace the open channel with a PVC pipe. The losses were estimated at about 17 AFY. The calculation is described in detail under the next question.

b. How have average annual canal seepage losses been determined?

There is currently no existing flow measurements or soil tests that could be used to determine seepage losses. DDWC estimated the expected losses based geological information about the area. Most of the channel, about 70% or so, crosses quaternary landslide deposits (Qls) while the rest crosses quaternary alluvium (Qa) and alluvial fan (Qf) deposits USGS Geological Map). The NRCS Web Soil Survey database classifies the soil in the area as flooded fluvaquents composed of "stratified very gravelly sand to clay loam." It describes the soil as poorly drained with low runoff capacity. It estimates its hydraulic conductivity as "moderately high to high" from 0.20 to 2.00 in/hr in its most-limiting layer (NRCS Web Soil Survey). DDWC will use the lower-boundary value on the assumption the soil is already saturated.

The seepage loss was estimated by multiplying the hydraulic conductivity, *k*, by detention time and footprint area, see Equation 1, below. DDWC's proposal would replace a half-mile of channel under this grant. That gives a footprint area of 5,280 ft². Multiplying by the 0.20 in/hr

conductivity value estimates to about 88 ft³/hr of seepage over the detention period. That equates to about 17 AFY of losses eliminated by using a PVC pipe instead.

$$Seepage = kA \qquad \textit{Equation 1}$$

c. What are the expected post-project seepage/leakage losses and how were these estimates determined?

This project proposes installing a PVC pipeline to divert and conduct 1.0 cfs from the Young Ditch headgate to DDWC's new storage tanks. This is expected to eliminate losses associated with trying to deliver its allocation via the existing open ditch.

d. What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Estimated 8.5 AFY per mile.

e. How will actual canal loss seepage reductions be verified?

Two weirs will be installed at the start of the project to quantify original actual flows. Post-project data will be measured by flow sensors installed with the new pipe. Inflow/outflow differences will be used to calculate seepage reductions in both cases.

f. Include a detailed description of the materials being used.

The pipe replacing Young Ditch will be PVC in sand bedding. The weirs will be made of concrete.

1.4.1.4.2 *Municipal Metering*

a. How has the estimated average annual water savings that will result from the project been determined?

Automating DDWC's metering is not expected to affect most customers' usage habits. However, a few customers are connected but don't have meters. They typically use more water. DDWC predicts they will curb their watering habits to levels similar to their neighbors' meters are installed and DDWC can strictly enforce its rate structure. The offending customers are currently using about 18 AFY, compared to nearby neighbors who use about 14 AFY. DDWC estimates it could save a about 4 AFY difference.

DDWC additionally expects react more quickly to problems with real-time system and customer information provided by AMI meters. Losses due to line breaks and leaks have amounted to 4.2 gpm (6.7 AFY) in recent years. DDWC estimates that most, about 60% of the losses accumulated while DDWC was either unaware or trying to locate the damage. It expects to save at least 4 AFY of leakage losses simply by being able to identify problems, deploy repair personnel, and locate damage or leaks more quickly.

DDWC also anticipates that real-time data analysis of customers' flows will enable it to detect anomalies that may indicate a leak on their side. It could then send a courtesy notice cautioning them of a necessary repair they may have not known about. DDWC hopes it may be able to reduce its own leaking losses by one or two percent.

In the past DDWC calculated its own user demand at around 400 GPHD with 150 taps allotted for the system. Together that's 60,000 GPD (67 AFY). If recognized, a 1.5% savings would translate to 900 GPD (1.0 AFY).

b. How have current system losses and/or the potential for reductions in water use by individual users been determined?

By routine monitoring, DDWC has identified individual users that use significantly more water the other customers and use too much water for outside and non-essential purposes.

c. Explain how expected water use reductions have been estimated and the basis for the estimations.

The potential for water use reduction has been estimated from seasonal water use records where summer demand typically increases by about 40% over winter months and closely monitoring outside uses.

d. What types (manufacturer and model) of devices will be installed and what quantity of each?

DDWC is planning to install Badger brand AMI meters with their associated Orion Network as a Service, Beacon Advanced Metering Analytics, and EyeOnWater Consumer Engagement accompaniments.

e. How will actual water savings be verified upon completion of the project?

Actual meter reading readings, reductions in outside water use, and realized operational savings.

1.4.1.4.3 *Irrigation Flow Measurement*

a. How have average annual water savings estimates been determined?

The farmers' decreed water rights is 0.5 cfs (184 AFY) distributed over half a year of flows. Through discussion with them and the local water commissioner, DDWC learned that of the 0.5 cfs that enters at Young Ditch, about 30% is lost in transit, including seepage. Therefore, about 55 AFY is lost.

The new pipe's maximum design flow will be 1.0 cfs and adjustable at its headgate. DDWC's decreed water rights allow collection of 0.25 cfs. The wetland's upkeep is expected to take another 0.25 cfs to match pre-project flows. And the farmers' 0.5 cfs would be retained in by this plan. Use of a pipe would prevent the 55 AFY transit losses. Less the seepage losses calculated previously, this suggests another 38 AFY could be saved.

b. Have current operational losses been determined?

This task is directly linked to proposed task #1 (replacing the unlined channel). It is the seepage losses (about 17 AFY) plus 38 AFY estimated by the farmers and water commissioner. This task aims improve transport to the farmers so they no longer need to make up the differences from the municipal water.

c. Are flows currently measured at proposed sites and if so, what is the accuracy of existing devices?

The farmers who would benefit from this project are currently using municipal water. Their billing history shows that they've used about 1.5 AFY in previous years.

d. Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.

DDWC will use the same process proposed for municipal metering (see ¶1.4.1.4.2.a). It will install flow sensors on the final pipe that carries overflow to the farmers. Also note that the two weirs to be installed in Task #1 may have some application here.

e. Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?

DDWC assumes that the farmers' usage needs will not change. The anticipated difference will be they would now be able to use raw water diverted directly from overflows at DDWC's new storage site, instead of treated water from the municipal system.

f. How will actual water savings be verified upon completion of the project?

DDWC will compare flows in the farmers' billing history to measurements from the diversion pipe once in operation.

1.4.1.4.4 *Turf Removal*

a. How have average annual water savings estimates been determined?

The NRCS has recommended an estimated one inch per week to keep turf healthy (NRCS Lawn Irrigation Guide). Therefore DDWC, estimated 2 AFY per acre, on the assumption that water happens half of the year. portion of its customers will not do it.

DDWC currently experiences spring flows of 42 GPM in the summer and 30 GPM in the winter with 30 to 40% being lost to off-peak overflow spillage. Thus, it concludes that about 12 AFY is being used for outdoor irrigation. It subsequently estimated that the service area contains about 6 acres of irrigated turf, based on the aforementioned watering rate.

True savings will depend on this extent to which customers use the program. DDWC assumes a significant portion of its customers will not do it. Therefore, it conservatively estimates a

potential 5% savings. Right now, DDWC is aware of 78 households that use municipal water for their lawns, the others typically have irrigation rights. Of those 78, DDWC expects 20 to 30% might be interested in the program. Consequently, its estimates, conservatively that 20% of the acreage could be replaced for 2 AFY of savings.

b. What is the total surface area of turf to be removed and what is the estimated average annual turf consumptive use rate per unit area?

The total potential surface area of turf to be removed is estimated at about 2 acres currently using on average of about 1.5 gpm through the summer months (or about 2 AFY or 1 AF/acre). The objective being to eliminate this use thereby conserving about 2 AFY.

c. Was historical water consumption data evaluated to estimate average annual turf consumptive use per unit area?

Historical summer/winter flow data was used to estimate the average annual turf water consumptive use per acre which did not include weather related adjustments.

d. Will site audits be performed before applicants are accepted into the program?

DDWC will make before and after site audits a requirement for acceptance into the program.

e. How will actual water savings be verified upon completion of the project?

DDWC plans to make before and after audits a requirement for program participate. Verification will also be provided by actual meter readings and monitoring outside use.

1.4.1.4.5 *Smart Irrigation Controllers, Controllers with Rain Sensor Shutoff, Drip Irrigation, and High-Efficiency Nozzles*

Applicants proposing smart irrigation controllers, controllers with rain sensor shutoff, drip irrigation, or high-efficiency nozzle projects should address:

a. How have average annual water savings estimates been determined?

A 2016 study by the Water Research Foundation concluded the percents distribution of household domestic water use shows on Table 2, below. These percents will be used to estimate the per household savings potentials for DDWC's proposed indoor and outdoor rebate programs (Water Research Foundation). This rate will be used with the savings rate advertised by EnergyStar and WaterSense devices to estimate a per-household savings.

Table 2: Percents breakdown of household water uses (Water Research Foundation).

Fixture	Use Volume (gphd)	Use Percent
Outdoor	137	50%
Toilet	32.6	11.9%
Faucets	27.0	9.9%
Shower Heads	26.9	9.8%
Clothes Washer	22.0	8.0%
Leaks	17.8	6.5%
Bath	4.4	1.6%
Other	4.0	1.5%
Dishwasher	2.2	0.8%
Total	***273.8***	***100%***

WaterSense-certified irrigation fixtures to be recommended for DDWC's rebate program are listed on Table 3, below. Its water savings percents shown are published numbers from the USEPA under the WaterSense program. Certified drip heads could not be found, likely because they aren't being improved upon from another, outdated technology. Converting drip heads was actually presented as ranging from 20% to 50% USEPA WaterSense). DDWC chose a conservative value for its estimate assuming that users may only upgrade part of their system.

Table 3: Possible water savings for certified irrigation devices published by the USEPA WaterSense (#USEPA WaterSense).

Appliance or Fixture	Certification	Water Savings
Sprinkler Bodies	WaterSense	10%
Micro (Drip) Irrigation	N/A	30%
Irrigation Controllers	WaterSense	30%
Soil Moisture Sensors	WaterSense	20%

DDWC currently experiences spring flows of 42 GPM in the summer and 30 GPM in the winter with 30 to 40% currently being lost to off-peak overflow spillage Thus, it concludes that 16 AFY is used for outdoor irrigation. It assumed an average 20% savings potential from Table 3. True savings will depend on this extent to which customers use the program. DDWC estimates a potential 5% savings assuming a significant portion will not do it.

DDWC has previously calculated its own user demand at around 400 GPHD with 150 taps allotted for the system. Together that's 60,000 GPD (67 AFY). If recognized, five percent savings would translate to 3,000 GPD (3.4 AFY).

b. Was historical water consumption data evaluated to estimate the percent reduction in water demand per unit area of irrigated landscape?

The total potential surface area of irrigated landscape is estimated at about 14 acres currently using on average of about 14 AFY through the summer months (or 1 AF/acre). Objective being to reduce this water use by at least 50% thereby conserving about 7 AFY.

c. What types (manufacturer and model) of devices will be installed and what quantity of each?

Proposed rebates would apply to any brand as long as they are WaterSense-certified by the USEPA for low flow/high efficiency. Devices proposed will be sprinkler heads, drip heads, soil moisture sensors, and irrigation controllers.

d. Will the devices be installed through a rebate or direct-install program?

DDWC proposes a flat rebate option as best because it lacks the manpower to administer multiple direct-install activities. Additionally, being a rural area, many customers are expected to want to install their own.

e. Will site audits be performed before and after installation?

Site audits will be made into a requirement for participation in the program. It will be performed before and after installations.

f. How will actual water savings be verified upon completion of the project?

Verification to be provided from actual meter readings and close monitoring of outside water use.

1.4.1.4.6 *High-Efficiency Indoor Appliances and Fixtures*

a. How have average annual water savings estimates been determined?

DDWC's proposed rebate program would offer discount coupons toward the purchase of EnergyStar or WaterSense certified appliances and fixtures. Table 4's device list, below, compares normal household use percents (Water Research Foundation)[1] to possible water savings published for EnergyStar[2] and WaterSense[3] certified products. These are multiplied in the last column to estimate the water savings potential in terms of percent-annual-household-reduction.

Naturally, any savings will depend on the extent customers use the program and what devices they upgrade. A maximum 10% is possible if all listed indoor devices in a household are upgraded. DDWC's prefers to estimate more conservatively at 5% because many customers may not do it while some may upgrade multiple devices. It has previously calculated its own user demand at around 400 GPHD with 150 taps allotted for the system. Together that's 60,000 GPD

[1] https://www.waterrf.org/resource/commercial-and-institutional-end-uses-water-0
[2] https://www.energystar.gov/
[3] https://www.epa.gov/watersense

(67 AFY). It has estimated a potential 5% savings from this program. If recognized, 5% savings would translate to 3,000 GPD (3.4 AFY).

Table 4: Certified high-efficiency devices proposed for DDWC's rebate program. These are shown with average household water use percents, water savings potential percents, and a combined factor to show that savings potential as a percent of annual household use (EnergyStar, USEPA WaterSense).

Device	Normal Household Water Use	Device Certification	Water Savings Potential	Energy Savings Potential	Water Savings Potential Based on Use
Outdoor	50.0%	WaterSense	20%		10.0%
Toilet	11.9%	WaterSense	20%		2.4%
Faucets	9.9%	WaterSense	30%		3.0%
Shower Heads	9.8%	WaterSense	20%		2.0%
Clothes Washer	8.0%	EnergyStar	33%	25%	2.7%
Dishwasher	0.8%	EnergyStar	30%	12%	0.2%
Leaks	6.5%				
Other	3.1%				
Total	**100.0%**				**20.2%**

b. What types (clothes washers, shower heads, etc.) of appliances and fixtures will be installed and what quantity of each?

Recommended appliances are EnergyStar-certified clothes washers and dishwashers. Recommended fixtures are WaterSense-certified toilets, faucets, and shower heads. The proposed rebate would apply to any brand as long as it has one of these two certifications of low flow/high efficiency.

c. Have studies been conducted to verify the existence of non-efficient appliances and fixtures?

No, but DDWC may engage qualified experts to conduct studies to verify the existence of non-efficient appliances and fixtures.

d. Will the devices be installed through rebate or direct-install programs?

DDWC proposes a flat rebate option as best because it lacks the manpower to administer multiple direct-install activities. Additionally, being a rural area, many customers are expected to want to install their own.

e. How will actual water savings be verified upon completion of the project?

Verification to be provided from actual meter readings and close monitoring of inside water uses.

1.4.1.4.7 *Solar Photovoltaic Power*

See evaluation criterion B.

1.4.2 Evaluation Criterion B—Renewable Energy (20 points)

1.4.2.1 Subcriterion No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

1.4.2.1.1 *Describe the amount of energy capacity.*

DDWC proposes installing a total of about 70 kW of solar PV capacity along with potential battery storage to meet the power requirements of five pumping stations to reduce energy costs, increase reliability, and reduce GHG emissions. We have used historical utility billings to determine monthly and annual energy consumption and expected solar capacity factors and battery storage losses to determine the design capacity. Table 5, below, shows the details.

Table 5: DDWC estimated solar capacity and expected greenhouse gas (GHG) reductions.

DDWC Estimated Power Use		**Average Power Use**		**Average Power Costs**		**Proposed Solar**		
No	**Location**	Hourly	Annual	Unit	Annual	PV	Output	Capital Costs
		(kW/Hp)	(kWh)	($/kWh)	($/yr)	(kW)	(kWh/yr)	($)
1	PH-1	3.16	30,000	$ 0.13	$ 3,900	20	38,544	$ 52,000
	41658 Needle Rock Rd	4.23						
2	PH-2	0.38	3,600	$ 0.25	$ 900	10	19,272	$ 32,000
	42692 Long Gulch Rd	0.51						
3	PH-3	0.25	2,400	$ 0.25	$ 600	5	9,636	$ 16,000
	43466 Long Gulch Rd	0.34						
4	PH-4	0.23	2,200	$ 0.25	$ 550	5	9,636	$ 16,000
	Long Gulch Rd	0.31						
5	Office & Yard	0.32	3,000	$ 0.25	$ 750	5	9,636	$ 16,000
	325 Spruce Lane	0.42						
6	Raw Water Storage (future)	2.10	20,000	$ 0.13	$ 2,600	20	38,544	$ 52,000
	Young Ditch	2.82						
7	Treated Water Storage (future)	0.42	4,000	$ 0.25	$ 1,000	5	9,636	$ 13,000
	40335 D Road	0.56						
	Totals	**6.86**	**65,200**	**$ 0.16**	**$ 10,300**	**70**	**134,904**	**$ 197,000**
		9.20						

Assumptions:								
1	Annualized Average Solar Capa	22%			Installed Cost for 5-10		$ 3,200	per kW
2	DMEA Net Metering				Installed Cost for > 10		$ 2,600	per kW
	Capacity Limit per single phas	25	kW					
	Capacity Limit per three phase	50	kW					
	Ave DDWC Exchange Rate	$ 0.16	per kWh		65,200	kWh/yr	$ 10,300	per yr
	Buy Back Rate	$ 0.11	per kWh		69,704	kWh/yr	$ 7,667	per yr
					134,904	kWh/yr	**$ 17,967**	per yr
3	Estimated GHG Reductions:		134,904	kWh/yr	1.50	lbs/kWh	**101.18**	tons/yr

Under a net metering agreement with the local utility, we envision placing 5 to 20 kW and potentially about four hours of battery storage at five pumping stations to meet 100% of our pumping demand with excess offered to help the utility meet power supply needs. Depending on negotiations with the local utility, we may elect to install the maximum amount of solar allowed under its net metering tariff of 25 kW for single phase services and 50 kW for three phase services.

All DDWC pumping stations are located on private property with no permitting requirements expected.

1.4.2.1.2 *Describe the amount of energy generated.*

The project is expected to deliver a minimum of 130,000 kWh per year with all excess being offered to help the local utility meet power supply needs.

1.4.2.1.3 *Describe any other benefits of the renewable energy project.*

- How the system will combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions

The system is estimated to reduce GHG emissions by at least 100 tons per year.

- Expected environmental benefits of the renewable energy system

Reduced GHG emissions and reduced line losses.

- Any expected reduction in the use of energy currently supplied through a Reclamation project.
- Anticipated benefits to other sectors/entities.
- Expected water needs, if any, of the system.

AND/OR

1.4.2.2 Subcriterion No. B.2: Increasing Energy Efficiency in Water Management

- 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.

Project expected to reduce amount electric energy purchased from the local utility by about 70,000 kWH/yr with savings exceeding $10,000/yr and realize about $8,000/yr in revenues from excess power sales to the utility.

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

Project expected to reduce GHG emission by at least 100 tons/yr.

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

Energy savings estimates from points of diversion and distribution pump houses.

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

Calculation includes water treatment.

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

Even though not included in calculations, project expected to significantly reduce vehicle miles driven.

- 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).

Installing the proposed small-scale renewable energy components could also be included as part of the SCADA system.

1.4.3 Evaluation Criterion C—Sustainability Benefits (20 points)

1.4.3.1 Enhancing drought resiliency.

- Does the project seek to improve ecological resiliency to climate change?

DDWC recently completed and published its own Drought Management Plan. It was written under a grant from the Colorado Water Conservation Board and designed to support their larger, "*Colorado Water Plan*" and "*Gunnison Basin Implementation Plan*." The goals proposed in this grant application are drought management responses recommended in that plan. DDWC believes these measures will improve ecological resiliency to climate change.

- Will water remain in the system for longer periods of time?

Project will increase the amount of water in storage from about a 1-day supply to more than 5-day supply thereby maintaining water temperatures and levels. Increasing storage time is expected to improve supply resilience to drought conditions. It is also expected to stabilize demand volatility at the collection point.

- Will the project benefit endangered/threatened species?

The Gunnison Sage Grouse is currently classified as "threatened" and has habitat in the local area. The U.S. Fish and Wildlife Service defines their preferred habitats and survival requirements as,

> *"These habitats are generally more mesic than surrounding habitat, and include wet meadows, riparian areas, and irrigated pastures."*

and,

> *"Gunnison sage-grouse are sagebrush obligates, requiring large, interconnected expanses of sagebrush plant communities that contain a healthy understory of native, herbaceous vegetation. The species may also use riparian habitat, agricultural lands, and grasslands that are in close proximity to sagebrush habitat."*

Figure 3, below, illustrates designated critical habitat regions identified by the U.S. Fish and Wildlife Service.[4] Occupied areas are typically found west of Highway 92, while DDWC's structures are mostly in unoccupied regions to the east. It is plausible that DDWC's project could give the birds some corollary benefit downstream, it does not appear to affect them directly.

[4] Bean, Michael J. *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Gunnison Sage-Grouse.* vol. 79 No. 224, U.S. Fish and Wildlife Service, 2014.

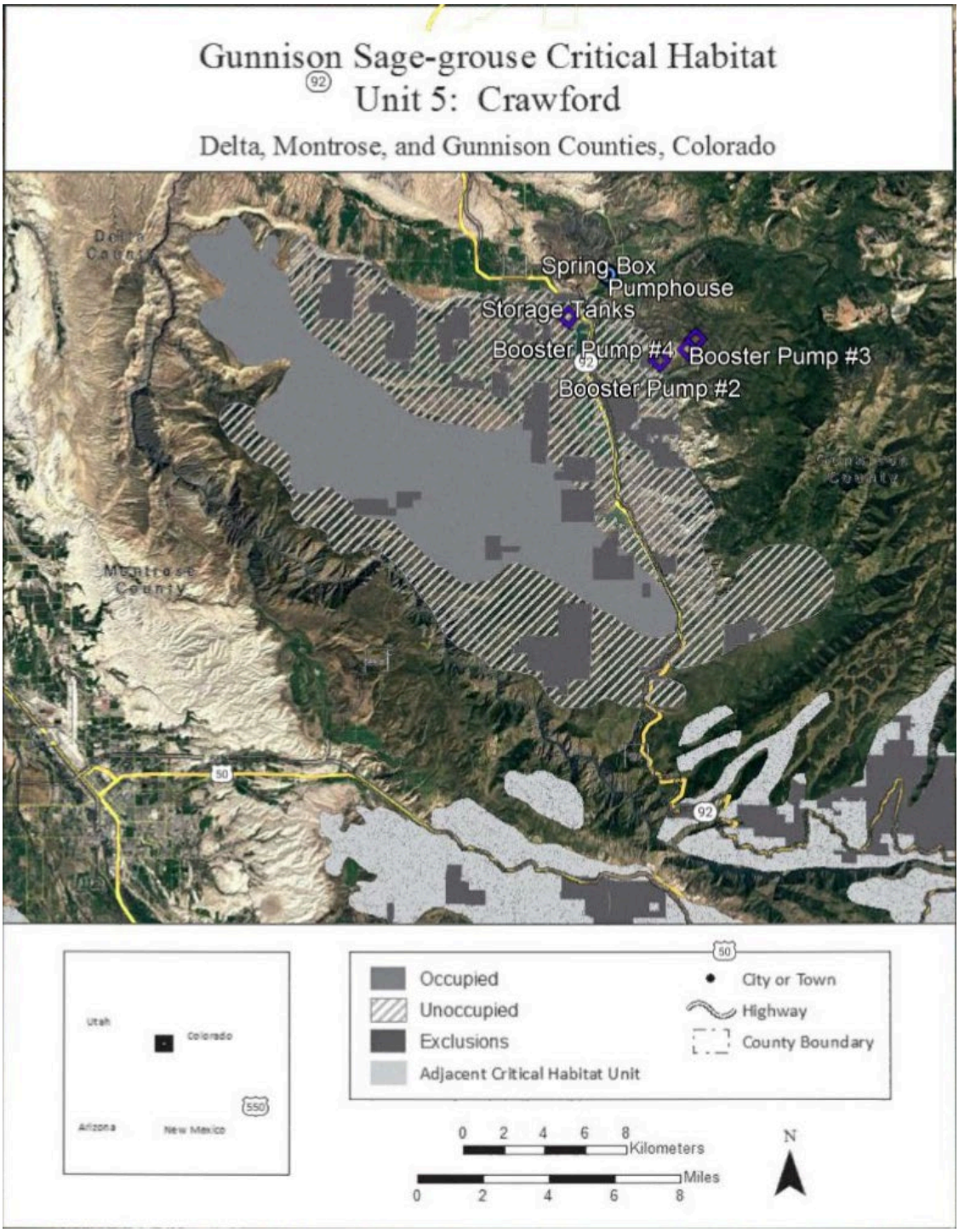

Figure 3: Gunnison Sage Grouse designated critical habitat region superimposed on a satellite map of DDWC's system structures. DDWC's proposed construction is between the pumphouse and storage tanks.

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

The project will directly result in more efficient management of existing water supply from greater operational flexibility, conservation measures, and creating energy savings.

Please describe the plan to monitor improved streamflows or aquatic habit benefits over a five-year period once the project has been completed. Provide detail on the steps to be taken to carry out the plan.

DDWC's has proposed installation of two weirs to measure preconstruction flows in Young Ditch. The project's design is set to include 0.25 cfs overflow to the wetland with the intent to match its current estimated inflow. Flow sensors are planned for the system, to include that pipe. Once completed DDWC expects to continue data collection and can present its five-year data as required.

1.4.3.2 Addressing a specific water and/or energy sustainability concern(s).

Will the project address a specific sustainability concern?

- 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.

This project will enhance and increase the benefits realized from our water storage and efficiency project applied for under opportunity R23AS00005 by adding solar energy to reduce energy costs and GHG emissions, implementing conservation measures to reduce water use, and complimenting on-farm irrigation needs.

- 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.

The local utility is making progress in shifting from largely fossil fuel resources to more renewables and encouraging the use of local renewable resources with a fair net metering plan. The addition of solar power to support DDWC's pumping operations will reduce its dependence on the local utility. Upgrading its customers to electronic AMI meters and managing them with a central SCADA system will allow the company to shift resources from in-person meter reading and significantly reduce drive time and its associated gasoline use. By spacing flow sensors along the system's length, DDWC can additionally improve leak detection and system troubleshooting. The sensors would help narrow down the location of faults in the system, thus reducing labor and equipment time spent on exploratory digging.

- Please describe how the project will directly address the concern(s) stated above.

Local and regional utilities are experiencing shortages from the reduction in available hydroelectric capacity stemming from prolonged drought conditions and would also benefit from our solar capacity.

DDWC's supply has also experienced shortages during recent drought years, causing it to have to implement severe restrictive measures. This summer, DDWC finalized and published its Drought Management Plan which included a number of countermeasures to improve water efficiency and be better prepared to respond to future droughts. DDWC has now moved to its implementation stage. The proposals in this grant application are derived from the findings in its Drought Management Plan. DDWC anticipates these improvements will provide significant drought and climate change readiness.

- 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.

Most of this application's proposals entail improvements to DDWC's overall efficiency. Its goal is to conserve water at the source. DDWC also intends to increase its raw water storage. It believes the extra storage volume, once filled, will help equalize flows and reduce the impact of demand volatility at the collection point.

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

This project is meant to enhance additional strategically placed storage and efficiency improvements as proposed under R23AS00005 resulting the conservation of even more water and broadening benefits.

The other grant's proposed system would work on its own. However, this grant includes automation improvements that would make for overall better performance. Additionally, the proposed upgrades in both grant applications are the implementation of measures identified in DDWC's Drought Management Plan.

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

DDWC estimates 167 AFY of conserved water to be used for the intended purposes.

1.4.3.3 Other project benefits.

Please provide a detailed explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

- Combating the Climate Crisis: E.O. 14008: "Tackling the Climate Crisis at Home and Abroad"
    - Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

This project will help mitigate the impacts of climate change by more efficiency using existing groundwater supply and making full use of existing surface water rights in a more efficient and sustainable manner.

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

The project strengthens our water supply sustainability and resiliency to climate change by making it possible to make full use of existing water rights.

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

Proposed project will use solar PV with potential battery storage for at least five (5) pumping stations to reduce energy costs, increase reliability, reduce GHG emissions, and help local utility meet power supply needs.

- Will the project result in lower greenhouse gas emissions?

The project will result in an estimate GHG reduction of about 100 tons per year.

(1) **Disadvantaged or Underserved Communities: E.O. 14008 and E.O. 13985**

a. Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community?

U.S. Census.gov published statistics for the Town of Crawford, Colorado, demonstrate that it is a low-income community compared to the rest of the United States. DDWC's proposed project can benefit the community via its improvements to their water distribution, efficiency, and drought resilience, as well as by the rebate offers toward high-efficiency appliances and fixtures.

b. Provide information to demonstrate that the community meets the disadvantaged community definition.

Crawford has recently experienced significant job losses associated with closure of the coal mining and energy product industry in the area. The town had a total population of 403 in the 2020 census. That census reported it had a median household income of $47,827, with 16.6% of the population having a Bachelor's degree or higher, and 66.3% employment rate.[5] National statistics, by comparison, have a median household income of $64,994 and 32.9% with a Bachelor's Degree or higher.[6]

c. 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

[5] https://www.census.gov/search-results.html?searchType=web&cssp=SERP&q=Crawford%20town,%20Colorado
[6] https://www.census.gov/searchresults.html?q=2020+median+income&page=1&stateGeo=none&searchtype=web&cssp=SERP&_charset_=UTF-8

particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

(2) **Other Benefits:** Will the project address water and/or energy sustainability in other ways not described above?

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

Project assists State and Federal water resource managers in complying with interstate compacts.

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

Project will benefit multiple sectors consisting municipal and agricultural users.

c. Will the project benefit a larger initiative to address sustainability?

Project supported by the CWCB and GBRT for helping to meet goals of the Colorado Water Plan and Gunnison Basin Implementation Plan.

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

DDWC is working with the CWCB, GBRT and USBR-CWCD regarding local water-related issues and has received a letter of support from the GBRT.

1.4.4 Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

- Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.
    - Provide a detailed description of the on-farm efficiency improvements.

Project proposes making full use of existing decreed irrigation rights by improving its Young Ditch conveyance and delivery system and using the overflow from the storage of said water supply for augmentation purposes with excess and overflow used to complement on-farm needs.

    - Have the farmers requested technical or financial assistance from NRCS for the on- farm efficiency projects, or do they plan to in the future?

DDWC has reached out to two local farmers served by Young Ditch who could benefit from the proposed improvements to the Young Ditch channel to explore the possibilities. It confirmed with the Regional Director of USDA-NRCS that they would be eligible for grant funding for making on-farm irrigation improvements stemming from the water conserved and made available from our project.

- 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.

DDWC has reached out to the farmer who owns land adjacent to the Young Ditch with a proposal to divert some of its overflow from its new storage for use by their field irrigation system.

- Applicants should provide letters of intent from farmers/ranchers in the affected project areas.

Letters are included in the attachments.

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

Project would directly facilitate on-farm improvements by making provisions for adjacent farmers to use its overflow to complement irrigation needs using efficient irrigation practices.

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

Installing a new PVC pipeline to divert and conduct Young Ditch water instead of the channel. Proposed design flow for the new pipe is 1.0 cfs. DDWC's decree collection is 0.25 cfs, 0.25 cfs is expected to sustain an existing wetland, which leaves 0.50 cfs for the two farms. DDWC has estimated 38 AFY in savings for the farms.

- Please provide a map of your water service area boundaries.

Please refer to Figure 1 on page 2 for DDWCs service area.

1.4.5 Evaluation Criterion E—Planning and Implementation (8 points)

1.4.5.1 Subcriterion E.1— Project Planning

Provide the following information regarding project planning:

a. Identify any district-wide, or system-wide, planning that provides support for the proposed project.

Attached Gunnison Basin Implementation Plan and GBRT support letter as well as our recently completed Drought Management Plan.

b. 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).

Our project meets the Gunnison Basin Implementation Plan goals by better managing and making full use of existing decreed water rights that also benefits other Smith Fork users.

c. 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.

By making full use of our senior Saddle Mountain Seep rights to meet domestic water supply needs for the next 20-30 years with our very senior Young Ditch irrigation water rights used for both augmentation purposes and complementing on-farm needs.

1.4.5.2 Subcriterion E.2— Readiness to Proceed

- Identify and provide a summary description of the major tasks necessary to complete the project.

1.4.5.2.1 *Gantt*

Figure 4, below, is shows summary tasks form this applications Gantt chart. The expanded schedule is included in this application's attachments. DDWC refers to the current grant application as "Grant 3". Some performance measurement periods may extend beyond the project end milestone, but they not illustrated that far for better readability.

The concurrent grant project is shown, grayed out, because some of its activities affect this application's proposed activities. The most-notable example is the other project will construct new storage tasks, and this project proposes to upgrade its open channel supply with a pipe. Other activities like permitting and erosion control will likely be done together. Some construction activities display interruptions for wintertime.

The three proposed rebate programs are illustrated for three-year availability based on this grant's associated execution period. They also share a monitoring and reporting activity to cover performance measurements collection.

ID	ID	Activity ID	Task Name	Start	Finish
1	1	GR3	**Grant 3 Conservation Measures & Renewable Energy Improvements**	5/31/23	9/30/26
2	2	GR3 0000	Award Grant 3	5/31/23	5/31/23
3	3	GR3 1000	Replace Unlined Channel with Pipe	6/1/23	9/30/24
7	7	GR3 2000	Municipal Metering	6/1/24	6/30/25
14	14	GR3 3000	Irrigation Flow Measurement	8/1/24	9/30/25
19	19	GR3 4000	Turf Removal	6/1/23	6/30/26
22	22	GR3 5000	Smart Irrigation Devices	6/1/23	6/30/26
25	25	GR3 6000	High Efficiency Rebate Program	6/1/23	7/31/26
29	29	GR3 7000	Solar Photovoltaic Power	7/1/23	9/30/25
33	33	GR3 9000	Grant 3 Construction Complete	9/30/25	9/30/25
34	34	GR3 9900	Grant 3 Reporting Complete	7/31/26	7/31/26
35	35	GR2	**Grant 2 Storage and Efficiency Improvements**	3/31/23	9/30/26
52	52	Both End	Project End	9/30/26	9/30/26

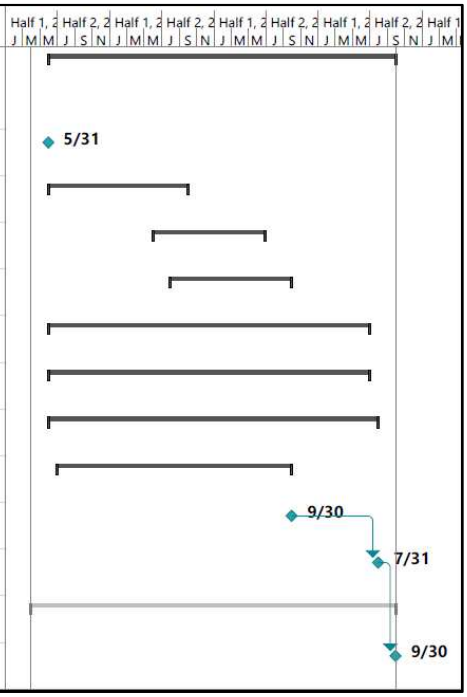

Figure 4: Summary Gantt chart for the total project. DDWC refers to the current grant application as "Grant 3" or code "GR3". Likewise, its prior grant application is numbered 2.

- Describe any permits that will be required, along with the process for obtaining such permits.

DDWC anticipates dig permitting, SWPPP, Notice of Intent, Dust Control for its pipe trenching activities. Most other activities such as solar and sensor installation are expected to be on roofs or indoors and only minor building type permits are expected. DDWC will conduct a thorough review of all permits that might be required including NEPA compliance.

- Identify and describe any engineering or design work performed specifically in support of the proposed project.

Only conceptual engineering.

- Describe any new policies or administrative actions required to implement the project.

None expected.

- Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

See attached Gantt Chart

1.4.6 Evaluation Criterion F—Collaboration (6 points)

- 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?

DDWC has mustered widespread support for the project from the CWCB, GBRT, CWCD, and the ditch companies supplied by the Smith Fork Project.

- What is the significance of the collaboration/support?

GBRT concurrence and support letter and collaborative discussions with Smith Fork Project managers and ditch companies.

Will this project increase the possibility/likelihood of future water conservation improvements by other water users?

Other local water companies have expressed interest in future water conservation improvements.

- Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).

1.4.7 Evaluation Criterion G—Additional Non-Federal Funding (4 points)

DDWC will ask the Colorado Water Conservation Board and the Colorado River Water District about grants and/or match funding. Additionally, DDWC has its own contributions as shown in the budget section.

1.4.8 Evaluation Criterion H— Nexus to Reclamation (4 Points)

- Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?

DDWC has a contract with Reclamation for release of about 2.3 AFY from its Blue Mesa reservoir during winter months for augmentation purposes.

DDWC is further aware that the USBR owns and operates the Crawford Water Conservancy District and associated Smith Fork project that manages the use and allocation of flows from local steams and reservoirs such as the Smith Fork and Crawford Reservoir. The proposed improvements have the potential for conservation at the collection point through more efficient use and less water waste. This in turn has the potential for avoiding or reducing the need for supplemental water from USBR.

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

Project expected to benefit the Reclamations' Smith Fork and Crawford Reservoir Project and potentially reduce or eliminate need for releases from its Blue Mesa Reservoir.

- Is the applicant a Tribe?

No.

1.5 Performance Measures

1.5.1 Replace Unlined Channel with Pipe.

Before and after inflow/outflow comparisons will be used as a performance measurement for this. DDWC will install two weirs along Young Ditch among the initial tasks after award. Their data monitoring will be ongoing while construction is being done. Seepage and evapotranspiration losses will be calculated as the difference between their measurements. Flow sensors installed in the completed pipe will provide the after comparison. DDWC will also ask participating farmers for water purchase records.

1.5.2 Municipal Metering.

DDWC proposes evaluating before and after household trends. It is uncertain whether metering, alone, will result in measurable water savings for most users. However, it does have some system abusers. DDWC estimates 6 AFY could be saved by reining in its water abusers with the new system. DDWC already employs a rate structure, so that will not need changed, but the improvements will help enforce it.

For energy savings, the AMI and SCADA systems are expected to reduce vehicle use by at least 20,000 miles/year for an assumed annual savings of $15,000/yr. These systems are further expected to improve system troubleshooting and leak monitoring. This improvement is expected to reduce labor and equipment time spent searching for damage that may save an estimated $20,000/yr.

Performance measurements will be conducted by analyzing data from the new system to each household's use in the same month in previous years. Comparisons will be done each month for a full year. Discontinuities will be measured in standard deviations from the mean. Typically, manual-read meters tend to read low over time. DDWC anticipates the new AMI meters will be more accurate and may read higher.

1.5.3 Irrigation Flow Measurement.

Flow comparisons between the channel and new pipe will be used as performance measurements for this activity. DDWC will ask the farmers for historic data or estimates of municipal flows

they've used before the project. Flow sensors added to the overflow pipes will measure flows they receive from the new system.

1.5.4 Turf Removal.

Performance measurement will be based on a comparison of summer-winter flow differences. DDWC will also perform before and after site audit as a criterion for participating in the project.

1.5.5 Smart Irrigation Devices.

Performance measurement for individual household savings will be based on month-by-month comparison of data from the new system compared to old readings from previous years. In that analysis DDWC will also measure the difference between the summer and winter flows to better characterize its outdoor component. DDWC will also perform before and after site audit as a criterion for participating in the project.

1.5.6 High-Efficiency Indoor Appliances and Fixtures.

Performance measurement for individual household savings will be based on comparison of data from the new system compared to old readings from previous years. DDWC will also perform before and after site audit as a criterion for participating in the project.

1.5.7 Solar Photovoltaic Power

DDWC's performance measures will be documented from actual energy cost savings realized. It will compare past years' power bills to power bills after the solar is installed for each month.

1.6 Project Budget

1.6.1 Budget Proposal and Funding Plan

Table 6 captures the breakdown of fund sources currently planned. Then Table 7 shows effectively the same thing but with applicant's contribution as a single value.

Table 6: Summary of Non-Federal and Federal Funding Sources.

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
DDWC In-Kind*	$ 50,000
DDWC Loans*	$ 50,000
Other Grants	$ 350,000
Non-Federal Subtotal	$ 450,000
REQUESTED RECLAMATION FUNDING	$ **450,000**

Table 7: Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$ 450,000
Costs to be paid by the applicant	$ 100,000
Value of third-party contributions	$ 350,000
TOTAL PROJECT COST	**$ 900,000**

1.6.2 Budget Narrative

1.6.2.1 Summary

DDWC's overall budget proposal is summarized on Table 8, below.

Table 8: Overall budget summary for the project proposed in this grant application.

Summary			
6. Budget Object Category	Total Cost	Federal Estimated Amount	Non-Federal Estimated Amount
a. Personnel	$79,170		
b. Fringe Benefits	$16,500		
c. Travel	$7,200		
d. Equipment	$50,000		
e. Supplies	$325,000		
f. Contractual	$0		
g. Construction	$422,130		
h. Other Direct Costs	$0		
i. Total Direct Costs	$900,000		
i. Indirect Charges	$0		
Total Costs	$900,000	$450,000	$450,000
	Cost Share Percentage	50%	50%

Note that DDWC has applied for a concurrent USBR grant #R23AS00005 for Storage and System Improvements. That project would work on its own. However, the current grant application aims to enhance its efficacy with automation and flow improvements. DDWC hopes to coordinate this both projects into the same design and construction phases to save on administrative and contracting costs. Consequently, it reduced some costs to reflect the efficiency gained. It lowered estimated personnel hours by 20% and equipment use by 30%.

1.6.2.2 Salaries and Wages

Table 9, below, lists the project management staff and their corresponding labor rates.\

Table 9: Project management staff salaries used in this budget. The complete table, including other comments is included in the attachments.

Personnel			
Position Title	**Time (Hrs or %)**	**Rate (Hr or Salary)**	**Total Cost**
Project Manager Y1	300	$80	$24,000
Project Manager Y2	300	$82	$24,720
Project Engineer Y1	300	$80	$24,000
Project Engineer Y2	300	$82	$24,720
Project Administrator Y1	300	$50	$15,000
Project Administrator Y2	300	$52	$15,450
			$0
		Total	$79,170
Additional Narrative/Comments: ***Hours discounted by 20% from efficiencies expected to be realized from adding this scope of work (under R23AS00008) to the work under previous USBR grant (under R23AS00005).***			

1.6.2.3 Davis-Bacon

DDWC recognizes a Davis-Bacon requirement applies to this contract. Wage determination #CO20220003 "Heavy Construction" applies to this project in Delta and Montrose counties. A newer version will likely be published for use and will replace this version when the time comes. Construction contracts will be issued with this requirement, plus a requirement to include it in subcontracts.

1.6.2.4 Travel

DDWC plans to hire local contractors, but anticipates some travel for its project management team. Table 10, below, estimates the expected costs per trip.

Table 10: Travel costs and estimated total cost per trip.

Purpose	From/To	# of Days	# of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem per Traveler	Cost per Trip
Final Project Presentation	Washington D.C. to Denver	2	1	$195	$345	$146	$114	$1,600
Stakeholder meetings	Las Vegas to Crawford, CO	10	1	$150	$150	$146	$114	$5,600
							Total	$7,200

1.6.2.5 Equipment

DDWC does not plan to purchase construction equipment. Construction activities will be contracted out.

1.6.2.6 Materials and Supplies

DDWC recognizes the Buy American Act requirement applies to this contract. It plans to use U.S. made materials in compliance with the associated clause. Main project materials will consist of AMI water meters, SCADA networking equipment, solar panels, and their associated electrical and communications supplies. See Table 11, below.

Table 11: Estimated cost of materials and supplies.

Supplies			
Supply Item	Quantity	Unit Cost	Total Cost
Ultrasonic Flow Meters	8	$1,250	$10,000
AMI Meters	150	$500	$75,000
AMI System	1	$25,000	$25,000
SCADA System	1	$50,000	$50,000
Artifical Turf	4	$10,000	$40,000
Smart Irrigation Systems	10	$5,000	$50,000
High Efficiecny Appliances & Fixtures	150	$500	$75,000
			$0
		Total	$325,000

1.6.2.7 Environmental and Regulatory Compliance Costs

This project includes about two-miles of trenching and pipe installation. Environmental and regulatory compliance will be included in the construction contractor's responsibilities.

1.6.3 Letters of Commitment

DDWC is presently in talks with farmers near Young Ditch about the partnering potential and possible NRCS grant described herein. DDWC has received and attached support letters from the farmers.

1.6.4 Pre-Award Costs

- The project expenditure and amount

DDWC anticipates minimal pre-award expenses since the award will be announced early in the construction season. However, it contemplates a possible need for early set up of data collection features that will be used to quantify the "before" stages of performance measurements. This may include construction of weirs at Young Ditch and installation of various supply-side flow and water level sensors.

- The date of cost incurrence.

Depending on the quantity of datapoints required, DDWC contemplates that most system performance measurements will require at least one year's worth of data. Some overlap before construction operations risk disturbing the collection activity. DDWC contemplates installation of weirs and sensors three to six months prior to award. This assumes that most major construction will begin in the 2024 construction season.

- How the expenditure benefits the project

Starting data collection early would help communicate a complete and accurate picture of the project's "before" state of the performance measures. It likewise reduces risks from overlapping with construction, such as disturbances that affect data accuracy or schedule delays.

1.6.5 §H.1 Environmental and Cultural Resources Compliance

Environmental and cultural considerations from announcement §H.1 are listed and answered, below.

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?

This proposed project includes trenching and installation about a half-mile of pipe. DDWC does not anticipate long-term environmental harm after the disturbance. It will ensure its construction contractor employs excavation best-practices like silt fences and dust control and complies permitting requirements like developing SWPPP plans and getting NOI letters. It will choose a path around heavily saturated areas where possible.

- 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 they be affected by any activities associated with the proposed project?

DDWC's proposed project is not located on federal property. A threatened species of grouse exists in the region, but is not known to inhabit areas proximal to the work site. Refer to ¶1.4.3.

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?"

This project is expected to benefit a wetland. DDWC's new proposed pipe moves water from an existing channel that connects the Smith Fork to a wetland near the Hwy 92 x D Road intersection. The design flow was established to retain its inflow after the project is complete.

- When was the water delivery system constructed?

The project's water delivery system was initially built in 1978 and then expanded in 2005.

- 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.

Work associated with this project is not expected to modify any irrigation systems. However, one of proposed rebate programs would offer incentives to tap holders to install water-efficient devices on their personal systems.

- 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.

The project does not involve any buildings, structures, or features in the irrigation district eligible for listing on the National Registry of Historical Places.

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

DDWC is not aware of any known archeological sites in the proposed area.

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

The project will not have a disproportionately high or adverse effect on low income or minority populations.

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

The project is not located on tribal lands, nor on lands that might be 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?

The project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

1.6.6 Required Permits or Approvals

DDWC does not anticipate any major permits or approvals will be needed for this project. Its scope entails indoor and roof work on existing structures. However, DDWC will seek to obtain appropriate permits if it becomes necessary. There is no proposed project work on Federal facilities.

1.6.7 Overlap or Duplication of Effort Statement

DDWC has submitted a grant application under R23AS00008 to enhance and increase benefits expected to be realized under R23AS00005. Grant R23AS00005's announcement is titled, "*Drought Response Program: Drought Resiliency Projects for Fiscal Year 2023*." DDWC's application proposed adding 240,000 gallons of new water storage capacity and improvements to its diversion and distribution systems. Presently, DDWC possesses 157 AFY of senior water rights, but only uses a 65 AFY groundwater portion for supply. These grant applications aim to make beneficial use of the remaining 92 AFY surface water portion.

DDWC's goal is to make the two grants work together in complimentary fashion without overlap. The previous grant application was submitted before DDWC recognized this one. So, this application's budget estimates are more current. DDWC is not presently aware of duplications, but is prepared to modify its combined proposals if that is found necessary.

1.6.8 Conflict of Interest Disclosure Statement

Teryl Stacey is a current, full-time employee of the U.S. Army Corps of Engineers. His position is administrative contracting officer for military construction at Nellis and Creech Air Force Bases in Nevada. DDWC is issuing this as a formal disclosure but does not foresee a possible conflict of interest with the USBR or its funding because the agencies are different and the missions are unrelated.

1.6.9 Restrictions on Lobbying

DDWC has no lobbying activities.

1.6.10 Uniform Audit Reporting Statement

DDWC will submit audit information if required.

1.6.11 Letters of Support

DDWC has received a letter of support from the Gunnison Basin Round Table (GRBT) for its planned improvements.

1.6.12 Letters of Partnership

DDWC is presently in talks with farmers near Young Ditch about the partnering potential and possible NRCS grant described herein. DDWC has received and attached support letters from the farmers.

1.6.13 Official Resolution

- Austin R. Hobbs is the DDWC official with legal authority to enter into an agreement.
- The DDWC board of directors, governing body, and appropriate officials have reviewed and fully support the application submitted.
- The DDWC has the capability to provide the amount of funding and/or in-kind contributions specified in the funding plan.
- DDWC will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.
- DDWC has conducted an official, mandatory resolution meeting as requirements set forth above.

1.7 Funding Restrictions

1.7.1 Indirect Costs

DDWC does not have a reasonably current indirect cost rate. It will use the 10% de minimus rate and acquire the required, formal indirect cost rate within three months of award.

§E. Application Review Information

2.1 Technical Proposal: Evaluation Criteria

This content has been moved to §1.4.

§F. Federal Award Administration Information

3.1 Administrative and National Policy Requirements

3.1.1 Automated Standard Application for Payments Registration

DDWC recognizes a requirement to use the Automated Standard Application for Payments (ASAP) system to manage progress payment activities.

3.1.2 Environmental and Cultural Resources Compliance

DDWC recognizes NEPA compliance requirements before any ground disturbing activities.

3.1.3 Approvals and Permits

DDWC recognizes state and local permitting requirements apply.

3.1.4 Geospatial Data and Data Tools

DDWC recognizes a requirement that contracted surveying activities meet FGDC standards.

3.1.5 Requirements for Agricultural Operations Under P.L. 111-11 §9504(a)(3)(B)

DDWC recognizes farmer participation conditions restricts increasing acreage or total water consumption as a consequence of this project. The farmers interested in using the project's overflow for irrigation needs will not be using it to increase acreage and don't intend to increase their consumptive water use as determined pursuit to Colorado law.

3.1.6 Application of Buy America Preference

DDWC recognizes that the Buy American Act applies to construction materials associated with this grant.

3.1.7 Additional Bipartisan Infrastructure Law Requirements: Wage Rate Requirements (Davis-Bacon Act)

DDWC recognizes a Davis-Bacon requirement applies to construction contracts funded by this grant. Wage determination #CO20220003 Heavy Construction applies to activities in Delta and Montrose Counties. A newer version will likely be published and will be used when the time comes to issue contracts. The appropriate clause will also be required for inclusion in subcontracts.

3.2 Reporting Requirements and Distribution

DDWC recognizes a requirement to disclose semi-annual financial reports and interim performance reports, and a final performance report.

3.3 Disclosures

DDWC recognizes a requirement to disclose conflicts of interest and criminal violations if they arise over the grant's duration.

3.4 Data Availability

DDWC recognizes a requirement to provide data collected or developed under this grant upon request, FOIA, or as required by the grant's scope. It is also cognizant that the data may be published or used to derive published content.