

NORTHEAST COLORADO  
WALKER RECHARGE PROJECT  
WATERSMART DROUGHT RESILIENCY GRANT APPLICATION



Applicant: Central Colorado Water Conservancy District  
Address: 3209 W 28<sup>th</sup> Street Greeley, CO 80634  
Phone: (970) 330-4540

Project Manager: Randy W. Ray, Executive Director  
E-mail: [r-ray@ccwcd.org](mailto:r-ray@ccwcd.org)

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## I. TECHNICAL PROPOSAL

### A. Executive Summary

The Central Colorado Water Conservancy District (“Central” or ‘District’), and its two subdistricts, the Groundwater Management Subdistrict (“GMS”) and Well Augmentation Subdistrict (“WAS”)<sup>1</sup> are located in Northeastern Colorado in Weld, Morgan and Adams Counties. Central is planning to construct a large recharge facility on the South Platte River near the towns of Wiggins and Orchard in Northeastern Colorado. The Walker Recharge Project (“Walker Project” or “Project”) will consist of diversions from the South Platte River to recharge basins<sup>2</sup>. The Walker Project will help Central conjunctively manage their surface and groundwater supplies to increase reliability of irrigation water supplied to agricultural producers in Colorado.

Recharge operations are a very effective method for Central to efficiently manage water supplies to better match irrigation demands using alluvial aquifers for temporary storage. Aquifer recharge operations are a drought resiliency strategy because they re-time water availability from periods of surplus to periods when supplies are insufficient. Central’s existing recharge operations have greatly increased reliability of their water delivery system and reduced vulnerability of the system to drought.

Central’s water management strategy is to actively pursue water development projects that provide efficient and sustainable water yield. The Walker Project will be an important component of Central’s integrated water delivery system. The Project will provide direct benefit to many Central constituents through greater and more efficient groundwater use, thereby improving crop yields. Local economies of many small communities in Colorado depend directly on the success of individual agricultural producers. Moreover, recharge projects such as the Walker Project provide for a stable water supply with less reliance on “buy and dry.” Agricultural producers in Weld, Morgan and Adams Counties contribute over \$3.0 billion annually to Colorado’s economy.

Grant funding through the WaterSMART Drought Response Program will assist Central during a) planning efforts to better understand the local site conditions, b) acquisition of necessary local, State and Federal permits, c) detailed engineering design, and d) construction of Phase 1 of the Walker Project (defined below).

### B. Background Data

Central was formed in 1965 pursuant to the 1937 Water Conservancy Act of the State of Colorado. The District includes over 750 square miles in Adams, Weld, and Morgan Counties (**Figure 1**). District boundaries include portions of several cities, towns and numerous smaller rural communities, and approximately 210,000 acres of irrigated agricultural lands supplied by ditches

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<sup>1</sup> Central, GMS and WAS may collectively be referred to as “Central” in this Application. GMS or WAS may be referred to individually in certain contexts.

<sup>2</sup> Recharge basins are used synonymously with “recharge ponds”, “recharge sites” and “recharge facilities” in this Application.

and groundwater wells. Major cropping within the District consists of corn, alfalfa, grains, vegetables, turf, beets, beans, and potatoes. The District stretches along the South Platte River from Commerce City to Fort Morgan. Policy and goals are established by a fifteen-member Board of Directors who are appointed by a District Court Judge. Since its inception, the Board of Director's goal has been to advocate for, support, and develop water resources within the South Platte River basin.

Central's two subdistricts, GMS and WAS, operate court-decreed plans for augmentation to replace depletions caused by the pumping of approximately 1,400 alluvial groundwater wells located within the District. Currently GMS and WAS have contracts to deliver up to approximately 80,000 acre-feet per year as augmentation supplies to replace depletions caused by alluvial well pumping. These wells provide a vital water supply to irrigated lands within the District and are used by producers as either a primary source of water or to supplement irrigation supplies when yield from surface water rights is insufficient. Alluvial wells, like surface water supplies, operate within Colorado's prior appropriation system, but water rights for wells are typically much more junior in priority.

The augmentation plans operated by GMS and WAS require protection of senior water rights, and that protection is satisfied by GMS and WAS delivering water to the river to replace depletions caused by well pumping. Replacement water includes recharge accretions developed through numerous decreed recharge projects operated by Central. If sufficient replacement water is not available, then well use is curtailed by State water administrators. In recent years well owners in the Central District have been curtailed by 50 – 75 percent because replacement supplies have not been sufficient.

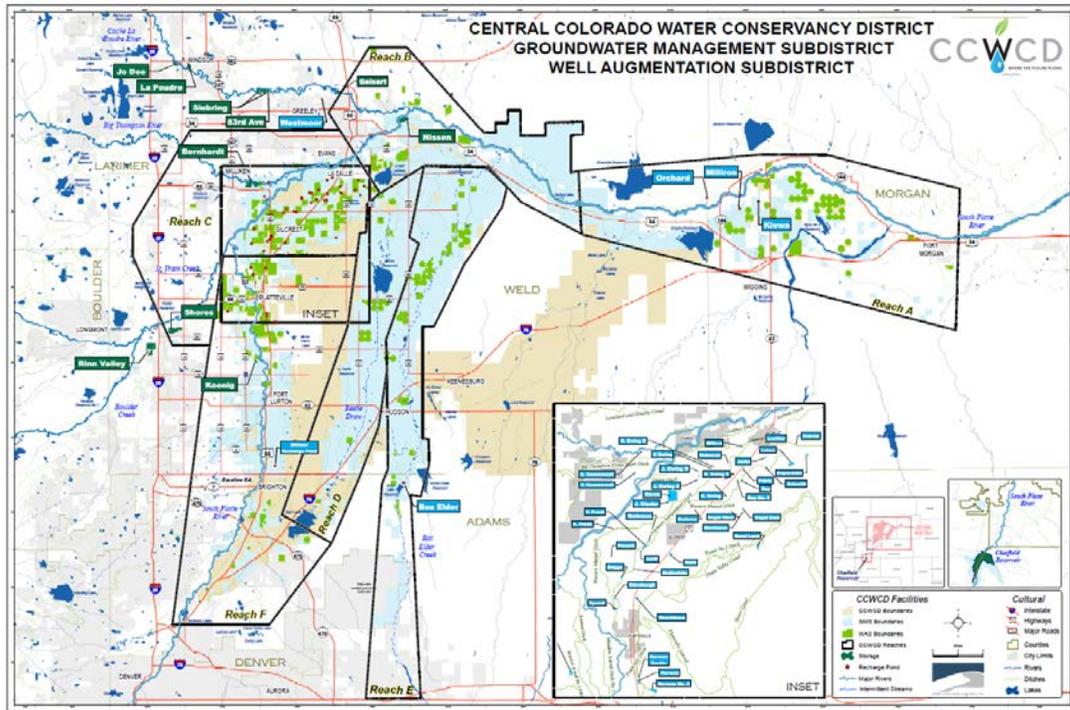
Although the alluvial wells in GMS and WAS are tributary to the South Platte River, their pumping effects do not impact flows in the River until some amount of time after pumping. This delayed response creates complications for water administrators because of the need to protect senior water right owners. It also results in substantial inefficiencies in use of water supplies. In 2012 and 2013 for example, severe drought conditions resulted in extremely low yield from senior surface diversions, but at the same time wells were curtailed by 60 percent even though the impact of pumping occurred much later. By the time well pumping actually impacted streamflows, there were historic flood events in the South Platte River Basin. This means full well use could have occurred during 2012 and 2013 without adversely affecting senior water rights.

Central currently owns and operates dozens of water rights, storage and recharge projects in the South Platte River Basin. Existing projects include fairly simple water right transfers, reservoir storage projects (typically sealed pits that remain after gravel mining operations), alluvial wells that pump directly back to the river, and recharge structures used to conjunctively manage Central's replacement water supplies.

The Walker Project will be operated to develop recharge accretions for use in the GMS and WAS plans for augmentation. Recharge projects are one of the most efficient replacement water supply options for Central because similar to well depletions, accretions to the stream occur after water has been diverted from the river, delivered into recharge ponds, and percolated into the alluvial

aquifer. This means that the accretions from recharge will coincide with the delayed effect of well pumping. Water diverted to recharge during times of abundance in the river are effectively retimed to create increased supplies during periods of drought. Recharge operations use the alluvial aquifer to better match water supply with water demand, thereby improving water use efficiency. Recharge operations allow conjunctive management of surface water and groundwater supplies.

*Figure 1: Central, GMS, and WAS Boundaries*



The Walker Project will operate under a decree entered by the District Court, Water Division 1, Colorado, in Case No. 16CW3202. Diversions from the South Platte River at rates up to 100 cubic feet per second (cfs) and volumes up to 30,000 acre-feet per year will be delivered to recharge ponds. Constituents of Central will receive direct benefits from the Walker Project by way of additional augmentation supplies and drought protection. Economic benefits of the Project will accrue indirectly to all areas of the District and throughout Colorado by increasing reliability of water supplies for primarily agricultural uses.

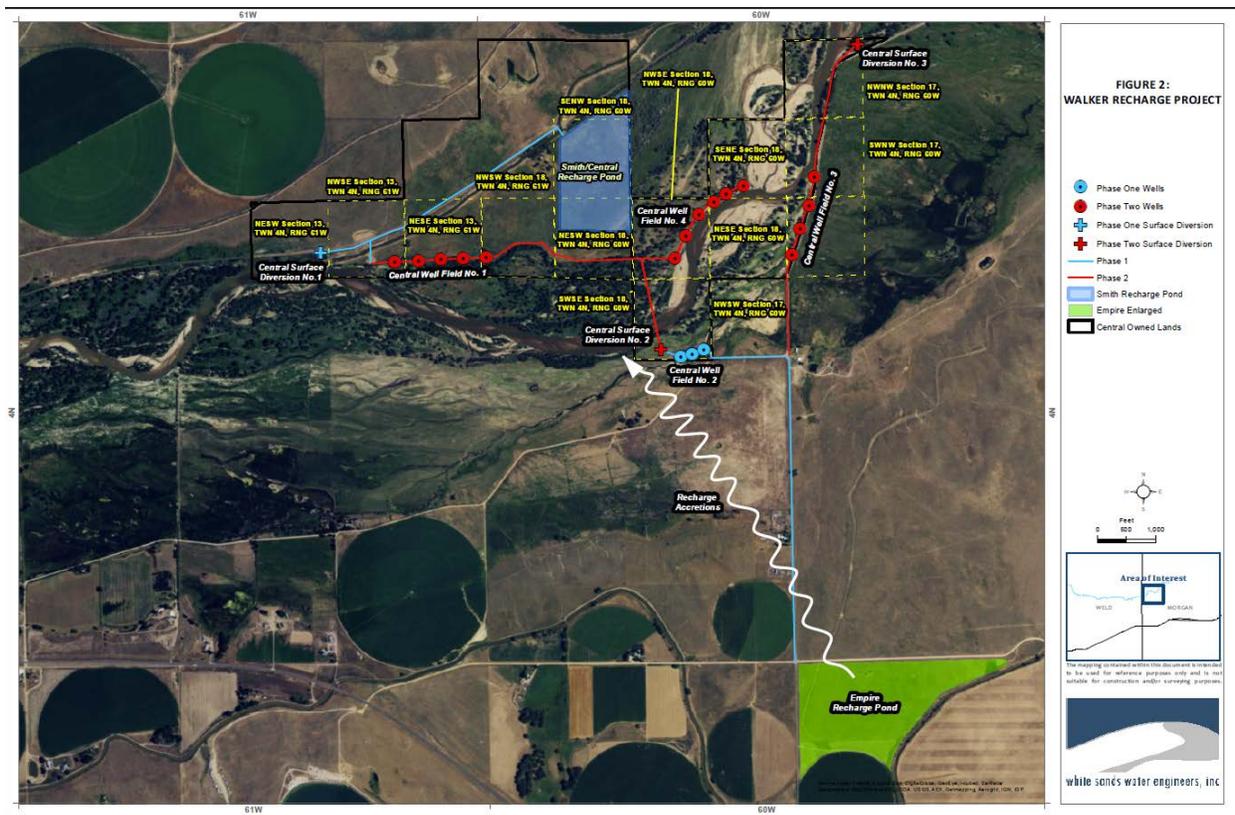
Central has previously established a working relationship with the Bureau of Reclamation through its Water 2025 Grant Program (Assistance Agreement No. 05FC602023). The previous project enabled Central to install water meters on constituent wells, improving reporting of groundwater pumping by its approximately 1,300 alluvial wells in the South Platte River Basin.

### **C. Project Description**

The Walker Project will be located in the State of Colorado, in Weld and Morgan Counties between the towns of Orchard and Wiggins (**Figure 2**). Water will be diverted from the South Platte River by four wellfields and three surface diversions located near the town of Orchard, in parts of Section

13, Township 4 North, Range 61 West of the 6<sup>th</sup> PM, and Sections 17 and 18 of Township 4 North, Range 60 West. Water will then be pumped south and east through a buried pipeline to various recharge facilities. Recharge ponds typically consist of large water-spreading basins that can percolate water into the underlying alluvial aquifer.

**Figure 2: Walker Project Vicinity Map**



Phase 1 of the Walker Project includes a) a surface diversion at the point of diversion of an existing irrigation ditch that diverts water from the South Platte River in the Southeast ¼ of Section 13 , Township 4 North, Range 61 West of the 6<sup>th</sup> PM, b) a recharge pond near the north bank of the South Platte River in the Northwest ¼ of Section 18, Township 4 North, Range 60 West, c) at least one well or wellfield located on the south bank of the South Platte River in the Southeast ¼ of Section 18, Township 4 North, Range 60 West, d) a pipeline to deliver water from the Phase 1 wellfield to recharge ponds, and e) at least one recharge pond located in the Southeast ¼ of Section 30, Township 4 North, Range 60 West.

Phase 2 of the Walker Project will include development of additional surface diversions, wellfields, pipelines and recharge ponds. Upon completion it is anticipated that the Walker Project will be able to divert and recharge up to 30,000 acre-feet per year at rates up to 100 cfs from the South Platte River for delivery to recharge ponds located at distances of up to three miles from the

River. Locations of individual recharge ponds will be staged at different distances in order to achieve different timing of accretion patterns and optimize project efficiency.

Specific efforts associated with developing the Walker Project include:

1. Land acquisition, preliminary concept development, legal appropriation of water by the Central Board of Directors, Water Court application. *These efforts have been completed.*
2. Detailed geologic data collection at site and numerical modeling to establish hydrologic characteristics associated with wellfields and recharge ponds.
3. Local, State, and Federal permitting.
4. Geologic and hydrologic site investigations.
5. Engineering design of infrastructure (surface diversions, wellfields, pipelines, pump stations, recharge ponds, measurement devices).
6. Operations and maintenance plan.
7. Construction
8. Control and measurement structures.

Phase 1 of the Walker Project is expected to be completed in 36 months. **This Application is being submitted to support Central's Phase 1 efforts.** Phase 2 will commence following completion of Phase 1. All efforts associated with development of Phase 1 are necessary to accomplish Phase 2.

#### **D. Evaluation Criteria**

##### **1. Evaluation Criterion A—Project Benefits (40 points)**

***Will the project make additional water supplies available?***

The Project will make additional water supplies available by diverting water during times it is legally and physically available and then effectively storing that water temporarily in the alluvial aquifer through the use of strategically located recharge facilities. Generally, diversions under the Project will occur during times of high streamflow, when the water would otherwise not be beneficially used. The accretions from the recharge operations under the Project will be available for later use by Central's constituents during times of drought. This conjunctive management of surface water and groundwater supplies will provide Central's members a reliable water supply in times of drought.

***If so, what is the estimated quantity of additional supply the project will provide and how was this estimate calculated?***

The exact quantity of additional supplies made available due to the entire Walker Project is still being determined, but Central has taken the required first steps under Colorado law to appropriate a water right with a diversion rate of up to 100 cubic feet per second (cfs) and a maximum annual volume of 30,000 acre-feet. It will likely take Central several years to develop the full water-yielding potential of the Walker Project, but it is expected that facilities associated with Phase I of the Walker Project will have capacity to divert up to approximately 50 cfs (50 percent of the total

Project yield). This would allow Central to retime diversions of approximately 15,000 acre-feet per year to periods of low streamflow.

***What percentage of the total water supply does the additional water supply represent? How was this estimate calculated?***

The Project scope is two-fold. When the Walker Project is in priority, up to 100 cfs will be diverted to groundwater recharge locations (50 cfs during Phase 1). This additional water will increase the supply for the GMS and WAS augmentation plans by developing recharge accretions. An additional benefit of the Project is the ability to divert excess year-round water supplies available to Central; the Project can divert fully consumable water that is already in the river in excess of Central's replacement obligations. Recharge basins receiving water from the Walker Project diversion points are located several miles from the South Platte River. The additional distance from the river increases the efficiency of the augmentation plans by retiming the water supply to make it available several years into the future. Based on a maximum Project yield of 30,000 acre-feet, the Walker Project could represent approximately 35 percent of Central's overall water supply on an annual basis, although on a monthly basis the percentage could be much higher. Since the Project will operate under relatively junior water rights, and assuming an average Project yield of only 20,000 acre-feet, the Project could represent approximately 25 percent of Central's overall supply (annual basis).

***Provide a brief qualitative description of the degree/significance of the benefits associated with the additional water supplies.***

The importance of this Project to Central's members and Northeast Colorado cannot be overstated. Colorado's population continues to grow at a rapid rate, placing an increasing demand on our natural systems, including water. Beginning in the 1990s, Central's members invested heavily in their augmentation plans by purchasing and upgrading infrastructure and other works, participating in extensive legal proceedings, conducting substantial engineering design and analyses, and acquiring sources of augmentation supply. These investments were made because of the importance of groundwater use in increasing water supply efficiency at the farm-level and protecting against drought. Though Central's augmentation plans are well-established, they can be improved by adding additional supplies. In recent years, the augmentation plans have operated anywhere between a 0% and 55% quota. The Walker Project will allow Central's members to continue to build their augmentation plans.

The Walker Project will clearly provide a direct benefit to Central's members, but it will also provide broader regional and environmental benefits. Weld County, a substantial amount of which lies within Central's boundaries, is the top agricultural producing county in the State of Colorado and one of the top three agricultural producing counties in the United States. Morgan County, also in Central's district, is similarly an agricultural powerhouse for Colorado. Producers in this region are confronted with climate uncertainties, increased competition for water resources, and an agricultural industry facing commodity price decreases on a scale we haven't seen since the 1980s. Establishing a resilient water supply will help sustain individual producers and regional economies, and ensure that our food and fiber continues to be grown locally.

Finally, the Walker Project provides environmental and societal benefits as well. Absent a dependable water supply, many agricultural producers in the region would opt to “dry-up” their farms. Wide scale “buy and dry” has led to significant environmental issues around the State – massive dust storms and soil erosion, loss of wildlife habitat and corridors, and the loss of water recharge sites. This mass transfer of water out of the agricultural sector has led to decreased tax revenues and declining social infrastructure in other basins around the State. Central and its constituents are committed to preserving working farms and the accompanying benefits of a thriving agricultural region.

***How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?***

The South Platte River Basin, like much of the Western United States, experiences sporadic hydrologic cycles, with extremely dry years increasingly the norm. The Walker Project will help span those dry years with needed augmentation supplies. Through the Project, Central will be putting water “in the bank” for later use. Recharge ponds that are a component of the Project will be strategically located to provide for a variety of lagged return (accretion) times. By strategically locating the ponds, Central will be able to firm up the yield of its junior water right such that it provides a dependable supply even in times of drought. Some of the ponds are closer to the river and will have shorter accretion periods, while others farther from the river will have longer accretion periods. These various accretion periods allow the recharged water to enter the river anywhere from several months to several years into the future as a reliable replacement supply for the GMS and WAS augmentation plans. The Project will continue to provide benefits for decades. Central has operated smaller recharge projects for nearly forty years. We anticipate replacement costs of infrastructure components as needed, and those costs will be budgeted so the Project will continue to operate. Outside of the replacement of mechanical pumping systems, the pipelines and recharge ponds will have a life that will extend for 50 years or more.

***How will the project improve the management of water supplies? For example, will the project increase efficiency, increase operational flexibility, or facilitate water marketing (e.g., improve the ability to deliver water during drought or access other sources of supply)? If so, how will the project increase efficiency or operational flexibility?***

The Walker Project, including Phase 1, will improve Central’s management of supplies, increase efficiency and improve the ability to provide water supplies during drought. Central manages and accounts for replacement water supplies on a daily basis, as required by the GMS and WAS decreed augmentation plans. On a daily basis, augmentation plan accounting determines if, where, and when GMS and WAS can divert various supplies in their portfolios. Having a large recharge project such as the Walker Project adds a tremendous amount of management flexibility. The recharge accretions derived from the Walker Project will return to the South Platte River at predictable times, locations, and amounts, which will give GMS and WAS reliable supplies well into the future. Management of supplies is also improved by locating recharge basins in the Project at various distances from the river; this allows improved control of accretions. Central expects the Project will be capable of diverting high river flows, even at flood stages when other diversion structures are unable to operate. Additionally, there are times during the winter months when water is available, but many surface structures may be unable to divert because freezing temperatures

impede the use of diversion structures; the Walker Project will be able to divert year round, even in freezing conditions because of relatively warm groundwater temperatures. Frequently, there are periods when regional storm events or peak periods of snow-melt runoff generate high river flows (these events have occurred in the past and will continue to occur) and are very unpredictable and often short in duration. Given the unpredictability and duration of such events, a project such as the Walker Project will capture large flows and put that supply to beneficial use by constituents in Central's boundaries well into the future.

***Will the project make new information available to water managers? If so, what is that information and how will it improve water management?***

In the process of obtaining a Water Court decree for the Walker Project and planning for the construction of the associated works, there will be detailed geologic and hydrologic site investigations and a localized groundwater model will be developed to determine the hydrologic relationship between alluvial groundwater and the surface flow in the South Platte River. Modeling results will be provided to other water users and the State of Colorado's Division of Natural Resources during the Water Court process. The additional data and modeling efforts will shed greater light on the interaction between the surface and alluvial groundwater in this and other reaches of the South Platte River. As a result of the scientific and engineering efforts conducted including the groundwater modeling efforts, information developed will be used to account for the diversions from the river and the resulting accretions to the river from delivery of water to the various recharge ponds included in the Walker Project. This data will be used on a daily basis by Central and will be vital to Central's water management system. All information developed during the Project will be made public through the Water Court process.

***Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.***

Yes, the Walker Recharge Project, including Phase 1, will provide wildlife and environmental benefits. Central currently operates dozens of recharge projects and has observed benefits ranging from providing additional habitat for waterfowl, especially during times of the year when other similar habitat may be limited, to large game such as deer using the ponds for watering and feeding. In addition, by providing Central's members with a cost-effective and reliable source of water supply, the Project will help keep over 100,000 acres of irrigated farm land in the Central district in production. Maintaining irrigated agriculture has demonstrated benefits, including soil conservation, providing important wildlife habitat and migratory corridors, open space, view sheds, carbon sequestration, and aquifer recharge. Farms and ranches that will benefit directly from the Walker Project provide these amenities simply by remaining in agriculture. These amenities have measureable economic value, as evidenced by municipalities in Colorado purchasing rights to similar attributes.

***What is the estimated quantity of water that will be better managed as a result of this project? How was this estimate calculated?***

The Walker Project, including Phase 1, is part of Central's integrated, complex water system. Central has a diverse portfolio of existing water rights includes direct flow, storage, recharge and

exchange rights. Central also leases water from municipalities; reusable effluent is used as a direct replacement supply and for diversion into various storage and recharge projects. Central's rights are diverse geographically (ranging from Chatfield Reservoir upstream to various recharge projects downstream near the town of Fort Morgan, and many water rights and projects in between). The Walker Project will be among the largest projects in Central's history in terms of the volume of water. It is strategically located in the lower ends of the GMS and WAS districts to balance and complement Central's other supply projects further upstream on the South Platte River. As discussed above, operational decisions are made daily as to what sources of supply will be used to meet Central's replacement obligations, and the Walker Project will be a significant planning tool for use by Central, GMS and WAS. The Walker Recharge Project will help Central manage its entire water portfolio in a more efficient manner, both in terms of legal requirements and protecting the river and its valuable ecosystem. Based on a maximum Project yield of 30,000 acre-feet, the Walker Project could represent approximately 35 percent of Central's overall water supply on an annual basis, and assuming an average Project yield of 20,000 acre-feet, the Project could represent approximately 25 percent of Central's overall supply (annual basis). Recognizing that the Walker Project will improve management of Central's overall water supplies, up to approximately 80,000 acre-feet will be better managed.

***What percentage of the total water supply does the water better managed represent? How was this estimate calculated?***

Central estimates that the Walker Recharge Project will be able to divert an average of 150 days per year in priority (times when there is not a call by a downstream senior water right). Overall the Walker Recharge Project will divert up to 100 cfs, which would result in 30,000 acre-feet diverted annually (100 cfs x 150 days). Phase 1 of the Project is expected to divert at rates up to 50 cfs during times when in priority, and there are often 5-20 cfs of consumable water in the River that is legally available for re-diversion at the Project.

Assuming Project yields of between 20,000 and 30,000 acre-feet per year, the Project represents approximately 25 to 35 percent of Central's overall water supply from its integrated system. However as noted above, the Walker Project will greatly improve Central's ability to manage all supplies in its system, not just the yield from the Project. This is because of the strategic location of the Project and the recharge aspect (retiming of supplies during times of surplus to times of drought).

***Provide a brief qualitative description of the degree/significance of anticipated water management benefits.***

Water management on the South Platte River is a daily operation because flows in the river and water demands change very often with weather conditions, demands by other water users, and other seasonal influences. Central has reviewed historical call records and South Platte River hydrograph data and it has determined that this Project will provide substantial benefits to Central and the region. Central operates similar, albeit smaller, projects along the South Platte River that demonstrate the water management benefits of these types of recharge projects. Similar to the proposed Walker Project, high flows and excess supplies diverted under Central's other recharge projects has allowed Central's members to have a diverse source of supply. Benefits of Central's

other projects can be enhanced with the proposed Walker Project because the Walker Project will distribute water supplies further from the river and generate longer accretion periods. Many Central constituents have surface water rights, and in dry years when those surface rights may not be available, well owners will have the certainty in knowing they have a drought resilient plan that includes the Walker Project that can bridge the dry years.

**If the proposed project includes any of the following components, please provide the applicable additional information:**

***What is the estimated capacity of the new well(s), and how was the estimate calculated?***

Aquifer tests and actual pumping operations of Central's neighboring Orchard Project indicate that traditional alluvial wells with 20 inch well casings can deliver approximately 7 to 8 cfs each, with the wells spaced 200 feet from each another. Central is investigating the advantages and disadvantages of installing either traditional vertical turbine wells or horizontal water collector wells (such as a Ranney Well System). In fact, Phase 1 of the Project includes developing a site specific groundwater model that will help answer these questions and facilitate well design. Depth to bedrock in the vicinity of the Project is approximately 90 feet, the saturated thickness of the aquifer is nearly 80 feet, and static groundwater elevations in the area range from 5 to 10 feet below land surface. Water bearing sands and gravels in the area are highly transmissive and capable of delivering the proposed 50 cfs at complete build-out of the Walker Project. The wellfield identified as a component of Phase 1 of the Project is expected to yield 40 to 50 cfs independently.

***How much water do you plan to extract through the well(s)? Will the well be used as a primary supply or supplemental supply when there is a lack of surface supplies?***

At full build out, the wells in the Walker Project will be able to divert up to 50 cfs in aggregate (this will be a legal constraint under the existing appropriation, not a physical constraint). The structures included in Phase 1 are expected to divert between 40 to 50 cfs. Water diverted under Phase 1 (and at full build out) will be delivered via pipeline to various recharge ponds. The Walker Project also contemplates surface diversions from three potential sites at a combined rate of 50 cfs. Central intends to operate the Project by diverting both surface water and groundwater. The importance and need of the groundwater diversions is to mitigate the effects and limitations of winter weather conditions that impair the ability to divert surface water. During typical winter operations on the South Platte River there are periods when surface water rights must cease operations because of freezing temperatures; this results in more water availability (both physical and legal) to more junior water rights. i.e., the more junior rights can divert via alluvial groundwater wells. By including both surface and groundwater diversion components in the Walker Project, Central is seeking to conjunctively manage and divert from both sources as each are available. Diversity of water supplies is an important part of a drought resiliency program.

***Please provide information documenting that proposed well(s) will not adversely impact the aquifer it/they are pumping from (overdraft or land subsidence). At a minimum, this should include aquifer description, information on existing or planned aquifer recharge facilities, a map of the well location and other nearby surface water supplies, and physical descriptions of***

*the proposed well(s) (depth, diameter, casing description, etc.). If available, information should be provided on nearby wells (sizes, capacities, yields, etc.), aquifer test results, and if the area is currently experiencing aquifer overdraft or land subsidence.*

There are three geologic units at the site of the Walker Project, including Quaternary Alluvial deposits, Quaternary Eolian deposits, and Tertiary and Cretaceous bedrock. Quaternary Alluvial deposits consist of interbedded sands, gravels, and clays that range up to 200 feet in thickness. The alluvial deposits generally have the highest transmissivity of the three geologic units and ranges up to 400,000 gpd/ft, and the highest specific yield (approximately 0.20). The Quaternary Eolian deposits are windblown clay, silt, and sand that generally form sand dunes and blanket deposits in the area. The thickness of the Eolian deposits ranges from 3 to 25 feet. However, there are several dune deposits that are up to 50 feet thick. Transmissivity of the Eolian deposits is considerably less than the alluvial deposits and ranges from 20 to 4,000 gpd/ft, and specific yield ranges from 0.01 to 0.20. Cretaceous bedrock deposits include the Laramie Formation and the Fox Hills Sandstone Formation, and together they consist of weathered layered claystone, shale, lenticular beds of sandstone, crossbedded sandstone, silty sandstone, and coal. The bedrock deposits have the lowest transmissivity and specific yield of the geologic units in the area.

Four wellfields are proposed for construction at the Walker Project (**Figure 2**). Phase 1 of the Project includes one wellfield (“Central Well Field No. 2”). Based on Central’s experience with a similar project located on adjacent property to the west of the Walker Project, five to six individual wells will be constructed on the south bank of the South Platte River (each well is expected to yield 7 to 8 cfs. No other alluvial wells exist in the immediate Project site. One to two recharge basins are also included in Phase 1 of the Walker Project. The recharge basins (recharge ponds) will be constructed approximately 1.5 miles south and east of Central Well Field No. 2. The recharge ponds will be located within the Eolian sand deposits described above.

The Walker Project will operate in accordance with well-established Colorado laws pertaining to the prior appropriation system. As discussed throughout this Application, Central is a sophisticated water district and has a long history of innovative projects, such as this Project, to develop water supplies within the confines of the prior appropriation system. Should the wells included in the Walker Project create lagged depletions which affect the river at times there is call for senior water, Central has a plan in place to comply with its legal requirements to replace such depletions. That plan, which is currently pending judicial review, will rely on credits generated from the Walker Project itself, but also rely on Central’s other established sources as necessary.

Perhaps more than any other entity in Colorado, Central and its members understand the importance of the South Platte River alluvial aquifer. We collect more data than any other entity and participate in cutting-edge research projects to better understand aquifer response to well pumping. Central is a proven leader in recharge projects and will take all measures necessary to protect against overdrafting and land subsidence. We have a track record of protecting the land resources in our districts and the aquifer; our future depends on it. There is no history of aquifer overdraft or land subsidence in the vicinity of the Walker Project.

***Please describe the groundwater monitoring plan that will be undertaken and the associated monitoring triggers for mitigation actions. Describe how the mitigation actions will respond to or help avoid any significant adverse impacts to third parties that occur due to groundwater pumping.***

Central collects extensive groundwater data as part of its routine water management practices. As noted earlier in this Application, Central worked previously with Reclamation to install water meters and telemetry on constituent wells, which improved monitoring and reporting of groundwater pumping. All wells included in the Walker Project will be equipped with advanced meters and measuring devices to allow Central to monitor diversions in real time. This information allows Central's managers to efficiently determine which sources in the system can best meet demand. Central's accounting of its water use is among the most thorough and complex in the State of Colorado.

No adverse impacts to third parties are expected to occur from groundwater use at the Walker Project. In addition, potential impacts will be completely mitigated through compliance with the Water Court decree adjudicated for the Project and strict compliance with Colorado's prior appropriation system of water rights administration.

## **2. Evaluation Criterion B—Drought Planning and Preparedness (20 points)**

***Attach a copy of the applicable drought plan, or sections of the plan, as an appendix to your application. These pages will not be included in the total page count for the application.***

Please see the attached Colorado Drought Mitigation and Response Plan, attached to this Application as **Exhibit A**.

***Explain how the applicable plan addresses drought. Proposals that reference plans clearly intended to prepare for and address drought will receive more points under this criterion.***

The Colorado Drought Mitigation and Response Plan ("Drought Plan") has three primary components: mitigation, response, and vulnerability assessment. The mitigation component described eight statewide goals for mitigating the risks of drought. The third goal is most relevant to the Walker Project: Enhance Mechanisms to Provide Water Supplies to Areas of Shortage During Droughts. One of the identified action items for this goal is to "Explore technologies for water supply banking, floodwater diversion storage, ***aquifer recharge***, snow banking." (emphasis added). Please see page 119 of the Drought Plan. The Drought Plan assigns this action item a "medium" priority, indicating that the development of such projects is ongoing and at least some should be implemented within 3-6 years. The Walker Project is an aquifer recharge project in support of Colorado's Drought Plan.

***Explain whether the drought plan was developed with input from multiple stakeholders. Was the drought plan developed through a collaborative process?***

The Drought Plan was the result of work and input from multiple stakeholders through the Drought Mitigation and Response Planning Committee (DMRPC), which included representatives from

various state, federal, and local agencies. Institutions of higher learning and other key stakeholders (representing conservation, agricultural, recreation, wildfire, utilities, and other interests) were also represented on the DMRPC. Please see pages 7-14 of the Drought Plan for a full list of DMRPC members and cooperating agencies.

***Does the drought plan include consideration of climate change impacts to water resources or drought?***

The Drought Plan identified climate change a substantial threat to the State as it relates to drought: “The interannual variability of the snow resource, the impacts of rapidly emerging factors such as dust-on-snow, and the possibility that climate change could cause substantial long-term reductions in Colorado’s seasonal snowcover, highlight the vulnerability of the state’s mountain snowpack and the economies that depend on the predictable storage and release of the water supply from snowmelt.” See Section 3.2.5 of the Drought Plan.

***Does the drought plan identify the proposed project as a potential mitigation or response action?***

The Drought Plan identifies “aquifer recharge” projects as an action item. See page 119 of the Drought Plan.

***Does the proposed project implement a goal or need identified in the drought plan?***

Aquifer recharge projects such as the Walker Project directly support the stated goals of the Drought Plan.

***Describe how the proposed project is prioritized in the referenced drought plan?***

Aquifer recharge is assigned a medium priority, evidencing the State’s intent to develop such projects within 3-6 years.

**3. Evaluation Criterion C—Severity of Actual or Potential Drought Impacts to be Addressed by the Project (20 points)**

The Drought Plan states, “The Agriculture Sector is a key economic driver in Colorado, and some form of agriculture activity is found in nearly every county in the State. The Colorado Department of Agriculture (CDA) estimates the value of grown, processed, and marketed agricultural products to be \$15 billion annually.” Much of the information described in this section comes from Annex B to the Drought Plan, which is attached as an **Exhibit B** to this Application.

According to the Drought Plan, much of the area within Central’s boundaries are classified as being in “Severe Drought” under the Palmer Drought Severity Index. The relationship between drought and Colorado’s agricultural sector is real, direct, and wide-ranging. The Drought Plan describes the results from a recent survey of farmers and ranchers in response to the drought of 2011. The results of that survey are clear: drought has real economic consequences for individual

producers, and the cumulative effect can be staggering - some producers, including respondents from portions of Central's district reported a decrease in revenues by as much as 60%.

The effect of drought on Colorado's agricultural sector include: loss of crop yield, loss of livestock, loss of reliable water supply (including lack of sufficient groundwater), loss of revenue, loss of system flexibility, and limited construction/reinvestment in agricultural enterprises. As competition for variable water supplies is increasing across the State, Colorado is exploring approaches to water management by which the agricultural sector can continue to thrive. These include interruptible water transfers, rotational fallowing, water banks, and most relevant to the Walker Project, aquifer storage and recovery.

In the livestock sector (Weld County and Morgan County rank among the highest in Colorado in cattle head count; see Annex B to Drought Plan), water quantity and quality can be a concern. In times of drought, livestock growers may be unable to grow their own forage (as was common in 2002 and 2011-2013) at a time when importing feed from elsewhere becomes prohibitively expensive, and as a result many growers may be compelled to sell breeding cows out of state. It can take years to recover the genetic diversity. Water quality concerns relate primarily to the sensitivity of certain forage crops to increased salinity present in times of drought.

If the status quo continues, and projects such as the Walker Project are not completed, conditions would be expected to worsen in Colorado's agricultural sector. Crop insurance premiums would continue to increase. Agricultural output would be expected to decrease and more farmland would be "dried up," with negative social implications for rural communities, environmental degradation, and decreased food security. There is frequent coverage in the Colorado media about the social implications of transferring water out of agriculture to meet our growing municipal demands. Agricultural property values decrease as the value of such property in Colorado is a function of water. As property values decrease, rural counties and towns have less revenue to support social services – investments in education, police and emergency services, healthcare, and infrastructure must be scaled back. As discussed above, environmental consequences of the loss of agricultural land are well documented and already occurring throughout the State. Loss of habitat, decreased biomass and carbon sequestration potential, and soil erosion are three prime examples. As we continue to lose the ability to grow our own food and fiber, we must rely on imports to meet our demands; this increases the carbon footprint of the agricultural sector. These effects are already being felt around the State. Central is committed to preserving agriculture in Northeast Colorado and mitigating the effects of drought.

#### ***4. Evaluation Criterion D—Project Implementation(10 points)***

Development of Phase 1 of the Walker Project is anticipated to be completed in 36 months. The initial tasks have already been completed. Conceptualization of the Project occurred during 2015 and 2016. Land necessary for the Project was acquired in October 2016. A resolution by Central's Board of Directors to appropriate water rights occurred in November 2016 and an application to the Water Court was filed in December 2016. A schedule of activities through the next 36 months is shown below.



Construction of Phase 1 of the Walker Project is expected to occur over an approximately 14 month period, beginning after final design has been completed and competitive construction bids have been received. Central works closely with several contractors in northeastern Colorado who have considerable experience in the types of construction involved with the Walker Project.

Operation of the Walker Project cannot begin until water delivery through all features can be properly measured and monitored. Central anticipates working closely with State water administration representatives concerning the selection and proper installation of measurement devices, data loggers, telemetry and SCADA.

Central does not anticipate any new policies of administrative actions required to implement the Walker Project

##### **5. Evaluation Criterion E—Nexus to Reclamation (10 points)**

###### ***How is the proposed project connected to a Reclamation project or activity?***

Portions of the infrastructure and works associated with the Walker Project are located on property adjacent to Reclamation property. There is no direct connection to any active Reclamation project, however the adjacent Reclamation property was land originally intended for the construction of the Narrows Reservoir. Central was one of the project proponents of the Narrows and Hardin Reservoirs in the 1970's. Central's Board of Directors view the proposed Walker Project as a "replacement" in many ways to those storage projects. The Walker Project has many advantages over the contemplated Narrows and Hardin Reservoir, mainly the off-channel location, relatively low project cost, and minimal evaporative losses.

###### ***Will the project help Reclamation meet trust responsibilities to any tribe(s)?***

There are no tribal issues associated with the Walker Project.

###### ***Does the applicant receive Reclamation project water?***

Central does not receive Reclamation project water.

###### ***Is the project on Reclamation project lands or involving Reclamation facilities?***

The project is not on Reclamation lands.

###### ***Is the project in the same basin as a Reclamation project or activity?***

The project is in the South Platte River Basin. Reclamation does cooperatively own and operate the Colorado Big-Thompson Project (CBT) with Northern Colorado Water Conservancy District which is in both the Colorado River and South Platte River Basins.

###### ***Will the proposed work contribute water to a basin where a Reclamation project is located?***

CBT return flows exist in the South Platte River basin where the project is located.

***Describe any projected increases to the severity or duration of drought in the project area resulting from climate change. Provide support for your response (e.g., reference a recent climate change analysis, if available).***

Central has not conducted an independent climate change analysis, but has worked cooperatively with other water users in the basin such as Denver Water, Northern Colorado Water Conservancy District and other large municipal water providers to better prepare for climate change. The general outcomes of these investigations support Central's Walker Project inasmuch that modeling efforts predict shorter durations and higher peak flows resulting from snow-melt run-off, along with more frequent and more intense summer monsoon thunderstorms. Streamflows from these thunderstorms peak higher and faster due to urbanization and the increase of impervious surfaces in Colorado's growing urban areas. These weather phenomena suggest that water users need to construct water storage and conveyance projects that can capture high flows in short time periods, and more importantly be able to attenuate or store that supply for times of shortage. The Walker Project is designed to meet that need, i.e., capture high flows when they are available and store the water in the alluvial aquifer.

## **6. Performance Measures**

The direct benefit to Central's constituents resulting from the Walker Project will be increased reliability of agricultural water supplies. The ability for agricultural producers to use alluvial groundwater is vital to their operations. If sufficient groundwater supplies are not available, many producers may choose not to plant crops because of the risk that drought conditions might result in inadequate surface supplies.

The Walker Project will provide agricultural producers within GMS and WAS the ability to use more alluvial groundwater to supplement surface supplies. This will increase the overall reliability of irrigation water supplies and decrease producer's vulnerability to drought. Direct benefits of the Walker Project are improvements to the conjunctive management of their integrated system of water resources in the South Platte River basin. This benefit can be directly measured by the amount of groundwater use (annual allocation) that GMS and WAS authorize annually.

Recharge operations have proven to be a very effective method for Central to develop additional replacement water supplies. Over the past 10 years Central has diligently developed and operated many different recharge projects adjudicated under prior Water Court decrees. Those efforts have resulted in improved allocations to constituents of approximately 25 percent (approximately or roughly 20 percent of the total 80,000 20,000 acre-feet of Class C and Class D contracted amounts).

## II. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

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

The earth disturbing work associated with Phase 1 of the Walker Project will include excavation of the recharge facilities, installation of a new surface diversion (off of or near an existing canal) and groundwater well, and pipeline to carry the water to the recharge facilities. The recharge facilities will be constructed on private property owned by Central or other lands which Central has negotiated a legal right to use. The planned sites for the recharge facilities included in Phase 1 are located on parcels of land which are currently not irrigated. Adding a recharge facility will increase habitat for waterfowl. In fact, Central has a history of working with conservation groups who see the benefit of adding recharge ponds to increase habitat. Central is experienced in constructing recharge ponds and has contracted with the leading construction organizations in the region for such projects in the past. The exact amount of earth to be excavated will need to be determined based on the depth to groundwater at the individual sites; usually only a few feet of earth material must be removed and it is often the case that the removed material can be used as a natural berm to form the contours of the recharge facilities.

The proposed pipeline for Phase 1 of the Walker Project will be buried and located largely on lands owned by Central, or in existing county road rights-of-way. Placing the pipeline in existing rights-of-way minimizes new disturbances to surrounding lands and generally avoids sensitive areas. The surface diversion will be on property owned by Central and will consist of a new headgate and small earthen canal to deliver the water to one recharge pond. Minimal earthwork will need to be completed for the surface diversion.

The groundwater diversions included in Phase 1 will also be located on Central's property. The design of the well system is still being investigated and will depend on the results of a site-specific groundwater model. Central's goal is to locate the wellfield in a location that minimizes environmental effects and the amount of energy required for pumping. One approach Central is investigating is the use of a horizontal well system which are more efficient in water collection and have less of a surface impact.

***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?***

Central is not aware of any Federal threatened or endangered species, or designated critical habitat in the Project area. Should there be any threatened or endangered species present, Central is proud of its participation in the South Platte Water Related Activities Program (SPWRAP), a consortium of water users organized to assist in the recovery of species listed as threatened or endangered under the Endangered Species Act (ESA) through the development and operation of the Colorado

Program component of the Platte River Recovery Implementation Program (PRRIP) in a manner that ensures the State of Colorado’s compliance with PRRIP.

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

Central has recently retained a special consult to analyze whether the wellfield associated with the Walker Project will be located in jurisdictional “Waters of the United States.” Should the determination be made that the wellfield will be located in jurisdictional waters, Central will take all steps necessary to seek and comply with the applicable rules and regulations.

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

Phase 1 of the Walker Project will be constructed within the next three years. Full buildout of the Project, which involves the construction of additional lengths of pipeline and recharge ponds will be constructed in future years.

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

The surface diversion included in Phase 1 of the Walker Project will divert from an existing surface diversion off the South Platte River known as the Weldon Valley Ditch. Central is a shareholder in the Weldon Valley Ditch Company, and received permission from the Ditch Company to include the diversion point in the Water Court application. Central will continue to discuss any necessary modifications with Weldon Valley Ditch Company and expects to provide the Ditch Company with detailed engineering specifications for their approval.

***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.***

A search of the National Register of Historic Places online database reveals the presence of several buildings and structures within the boundaries of the Central Colorado Water Conservancy District (Figure 1) are included on the Register. However, there are no such buildings, structures or features identified within the site boundaries of the Water Project (Figure 2).

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

None.

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

No.

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

No tribal lands will be affected by the Walker Project.

*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?*

Central does not anticipate that the Walker Project will contribute to the spread of noxious weeds. In fact, maintaining healthy, irrigable agricultural land helps prevent the spread of noxious weeds.

### **III. LETTERS OF SUPPORT**

Various letters of support of the Walker Project are included in **Exhibit C** to this Application.

### **IV. REQUIRED PERMITS OR APPROVALS**

Colorado law requires that Central obtain Water Court approval to obtain a recognizable water right. Central filed an application on December 30, 2016 in Colorado's Division One Water Court, a copy of which is attached to this Application as **Exhibit D**. Central has extensive experience in prosecuting such applications and expects that a decree approving the Walker Project to be entered in 1-3 years (this is consistent with Central's experience and the current level of Water Court activity). Central will also need to obtain well permits from the Colorado Division of Water Resources for the wellfields included in the Walker Project. Central will apply for such permits in accordance with Colorado law and fully expects that such permits will be issued.

Central will fully comply with any other permits as necessary.

### **V. OFFICIAL RESOLUTION**

The Central Board of Directors will adopt a resolution at their regularly-scheduled meeting to be held on February 21, 2017. A copy of the Resolution is attached hereto as **Exhibit E**.

## VI. PROJECT BUDGET

### A. Funding Plan

The Walker Project is a collaborative effort between Central, GMS, and WAS. The land required for the Project was purchased in October 2016, and is not an expense Central is requesting to be included in this grant application. Similarly, Central is not requesting inclusion of expenses associated with initial project conceptualization and appropriation of water rights. There are no other expenses prior to the start date to be included in this grant.

The estimated cost to complete Phase 1 of the Walker Project is seven million dollars. There are two possible scenarios for funding this project shown in the table below.

<u>Bond</u>		<u>No Bond</u>			
GMS Bond	\$4,000,000	CCWCD Budget Commitment			\$1,500,000
CCWCD Budget Commitment	\$1,000,000	WAS CWCB Loan			\$2,750,000
WAS CWCB Loan	\$1,000,000	GMS CWCB Loan			\$2,750,000
GMS CWCB Loan	\$1,000,000				
<b>Total Funding</b>	<b>\$7,000,000</b>	<b>Total Funding</b>			<b>\$7,000,000</b>

The first funding scenario involves a public election for the constituents in the GMS district. GMS will ask for a voter-approved tax mill levy so that the GMS subdistrict can increase its debt limits. If approved by the voters, GMS will apply four million of the funds raised through the mill levy to the Walker Project. In addition, Central has cash on hand to make a one million dollar contribution, and both GMS and WAS are qualified and approved to take a one million dollar loan each from the Colorado Water Conservation Board (CWCB), repaid by tax collections.

The second funding scenario assumes that the GMS constituents do not approve a new tax mill levy. In that situation Central would contribute one and one-half million dollars in cash to the project, and GMS and WAS would each borrow the remainder from the CWCB.

Central has one pending funding request on the Walker Project that has not yet been approved. A \$100,000 severance tax grant has been applied for through the CWCB. These funds would apply to initial engineering analysis of the project, and not be included in the scope of work for this grant application.

### **C. Budget Narrative**

Major project expenditures will be for legal, engineering, construction, equipment, and site work. A right-of-way will need to be established for construction of the pipeline that extends from the South Platte River to recharge basins, and extensive legal and engineering analysis will be necessary to design the project. In addition, a detailed numerical groundwater model will be developed to better understand the alluvial geology in the vicinity of the Walker Project, to determine the most efficient location to construct the groundwater wells and to and to optimize the location and size of recharge basins.

The most expensive part of the Project will likely be the construction of the well field, surface diversion, pipeline, and recharge ponds. Equipment costs will also be substantial to purchase the wells for the wellfield.

Central has allowed for a 15% contingency on this project.

### **VII. UEI AND SAM**

Central is registered with SAM, and the UEI is 0407265230000.

**Weldon Valley Ditch Company**

**P.O. Box 626**

**Weldona, CO 80653**

February 9, 2017

Dear USBR Drought Resiliency Grant Review Committee:

On behalf of the Weldon Valley Ditch Company, I am writing in support of the Central Colorado Water Conservancy District's (CCWCD) grant application for the Walker Recharge project, located in northeast Colorado. This water retiming project is an innovative and collaborative water management tool that will be instrumental in maintaining agricultural production; as well as supporting industrial, commercial, and municipal needs in the South Platte River basin.

Diverting available year-round supplies to alluvial groundwater recharge ponds located several miles from the river is needed project to help mitigate sporadic drought conditions on the river. The result will be improved water management and efficiency practices. The Walker Recharge project will benefit many water users in the South Platte River basin, adding a dimension that makes it more regionally impactful, collaborative, and valuable as a multi-benefit water management model as called for in the Colorado Water Plan.

Both Weldon Valley and CCWCD have contributed significant time and expertise to this project and are committed to continuing this advocacy and support as this effort moves forward. Weldon Valley supports their efforts and also strongly supports the USBR Drought Resiliency Walker Recharge grant application before you.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric R. Christensen", with a long horizontal flourish extending to the right.

Eric R. Christensen  
Secretary



February 9, 2017

Dear USBR Drought Resiliency Grant Review Committee:

On behalf of the Town of Wiggins, I am writing in support of the Central Colorado Water Conservancy District's (CCWCD) grant application for the Walker Recharge project, located in northeast Colorado. This water retiming project is an innovative and collaborative water management tool that will be instrumental in maintaining agricultural production; as well as supporting industrial, commercial, and municipal needs in the South Platte River basin.

Diverting available year-round supplies to alluvial groundwater recharge ponds located several miles from the river is needed project to help mitigate sporadic drought conditions on the river. The result will be improved water management and efficiency practices. The Walker Recharge project will benefit many water users in the South Platte River basin, adding a dimension that makes it more regionally impactful, collaborative, and valuable as a multi-benefit water management model as called for in the Colorado Water Plan.

Both the Town of Wiggins and CCWCD have contributed significant time and expertise to this project and are committed to continuing this advocacy and support as this effort moves forward. The Town of Wiggins supports their efforts and also strongly supports the USBR Drought Resiliency Walker Recharge grant application before you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Paul Larino", with a long horizontal flourish extending to the right.

Paul Larino  
Town Administrator