CWCB Loan Feasibility Study
Walker Recharge Project

Central Colorado Water Conservancy District
Groundwater Management Subdistrict
Well Augmentation Subdistrict

PREPARED FOR:

COLORADO WATER CONSERVATION BOARD

JULY 2018

FEASIBILITY STUDY APPROVAL
Pursuant to Colorado Revised Statutes 37-60-121 &122, and in accordance with policies adopted by the Board, the CWCB staff has determined this Feasibility Study meets all applicable requirements for approval.

Signed _____ 9/7/18 Date

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white sands water engineers, inc

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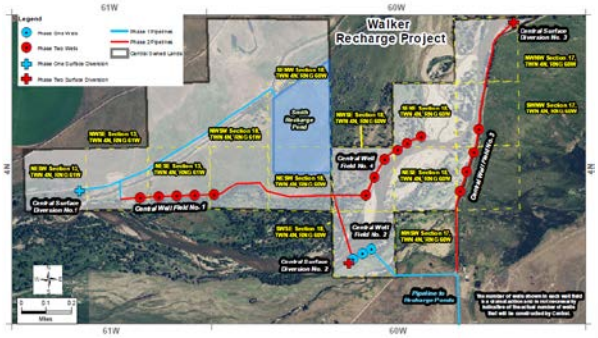

The technical material in this report was prepared by or under the supervision and direction of the undersigned, whose seal as a Professional Engineer is affixed below

COLORADO REGISTERED
EDWARD JOSEPH ARMBRUSTER, III
37253
7/27/18
PROFESSIONAL ENGINEER

_____

Ed Armbruster, P.E.
President

The following staff at Central Colorado Water Conservancy District contributed to the preparation of this report.

Randy Ray, Executive Director
William Mihelich, District Engineer
Danyelle McCannon, Financial Analyst

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1 Introduction

This report summarizes results of a feasibility study completed for the Central Colorado Water Conservancy District (Central or CCWCD), the Groundwater Management Subdistrict (GMS), and the Well Augmentation Subdistrict (WAS). CCWCD, GMS and WAS are the Project Sponsors. The study focused on the feasibility of Central, GMS and WAS developing the Walker Recharge Project in northeastern Colorado.

The Walker Recharge Project is in Weld and Morgan Counties between the towns of Orchard and Wiggins (**Figure 1**). The Project is a water supply re-timing effort, i.e., water supplies during times of excess are re-timed to periods of shortage. The alluvial aquifer of the South Platte River is the mechanism used to accomplish the re-timing. Retimed water supplies will be used as augmentation credits in plans for augmentation operated by Central, GMS, WAS and Project partners. Project partners may include Town of Wiggins, Orphan Wells of Wiggins, LLC, Riverside Irrigation District, Bijou Irrigation Company, Weldon Valley Ditch Company and several local dairy operations that have need for additional augmentation supplies.

This report is intended to support three separate applications to the Colorado Water Conservation Board (CWCB) by Central, GMS and WAS to borrow up to a total of $15 million from the Water Project Loan Program. Funding from the loans will be used to develop the Walker Recharge Project. Following is a summary description of Central, GMS, and WAS, their purpose, existing facilities and operations, their need for the Project, and their assets, financial resources and ability to repay the requested loaned funds to CWCB.

White Sands Water Engineers, Inc. and staff at Central conducted this study and prepared this report at the request of the Board of Directors of CCWCD.

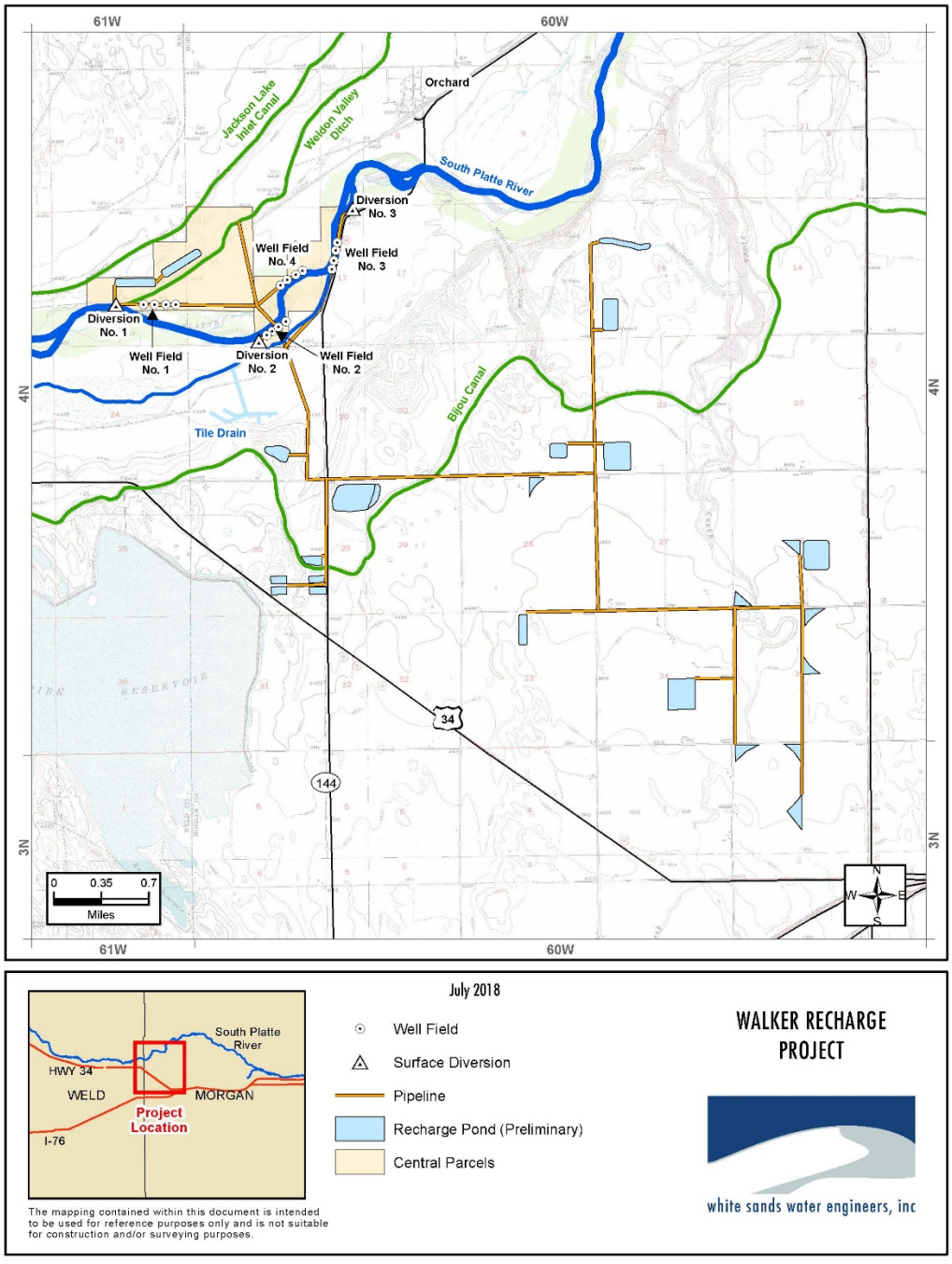

Figure 1. Walker Recharge Project

2 Central, GMS and WAS

Central was formed in 1965 pursuant to the 1937 Water Conservancy Act of the State of Colorado (CRS 150-5). The District includes over 750 square miles in Adams, Weld, and Morgan Counties (**Figure 2**). The geographic boundary of CCWCD generally includes lands in the South Platte River basin between Denver and Fort Morgan, Beebe Draw, and the lower portions of the Box Elder Creek and Lost Creek drainages. The boundaries of Central include portions of several cities and towns (e.g. Thornton, Brighton, Fort Lupton, Platteville, Greeley and Fort Morgan), numerous smaller rural communities (e.g., Gilcrest, LaSalle, Kersey and Hudson) and approximately 210,000 acres of irrigated agricultural lands supplied by ditches and groundwater wells.

GMS is a subdistrict of Central formed in 1973. One of its purposes is coordination and operation of a plan for augmentation to replace depletions caused by the pumping of alluvial wells owned by its constituent members. GMS was formed through an amendment to the decree authorizing formation of Central. GMS boundaries are similar to the boundaries of the District but do not include the Lost Creek drainage. GMS operates the plan for augmentation decreed in Case No. 02CW335 (the "GMS Decree" or the "GMS Plan for Augmentation"). There are currently 892 constituent wells in the GMS augmentation plan distributed among 518 allotment contracts. In addition, GMS replaces evaporative losses associated with two unlined gravel pits that expose groundwater to the atmosphere.

WAS is another subdistrict of Central and was formed in 2004 to provide replacement water for some of the wells formerly relying on Groundwater Appropriators of the South Platte (GASP) for augmentation supplies. The decree authorizing WAS formation was entered by the Weld County District Court in Case No. 03CV1408. Numerous GASP wells were not included in the WAS Plan and either sought augmentation supplies through other organizations or ceased to operate. WAS extends over the same broad area as GMS but is geographically smaller in terms of the number of acres included. The WAS boundaries specifically include only those lands identified in individual contracts, i.e., the WAS boundaries are not contiguous. WAS operates the plan for augmentation decreed in Case No. 03CW099 (the "WAS Decree" or the "WAS Plan for Augmentation"). There are currently 292 constituent wells in the WAS Plan distributed among 166 allotment contracts. In addition, WAS replaces evaporative losses associated with one unlined gravel pit that exposes groundwater to the atmosphere.

Individual GMS and WAS groundwater wells have water right priority dates ranging from 1906 to 1991. Most of the wells were constructed during the 1930s, 1940s and 1950s, and approximately 85 percent of the wells have priority dates senior to 1960. Depletive effects of pumping constituent member wells are replaced by operation of the GMS and WAS augmentation plans when there is a call for water from a downstream water right senior to the priority date of individual wells.

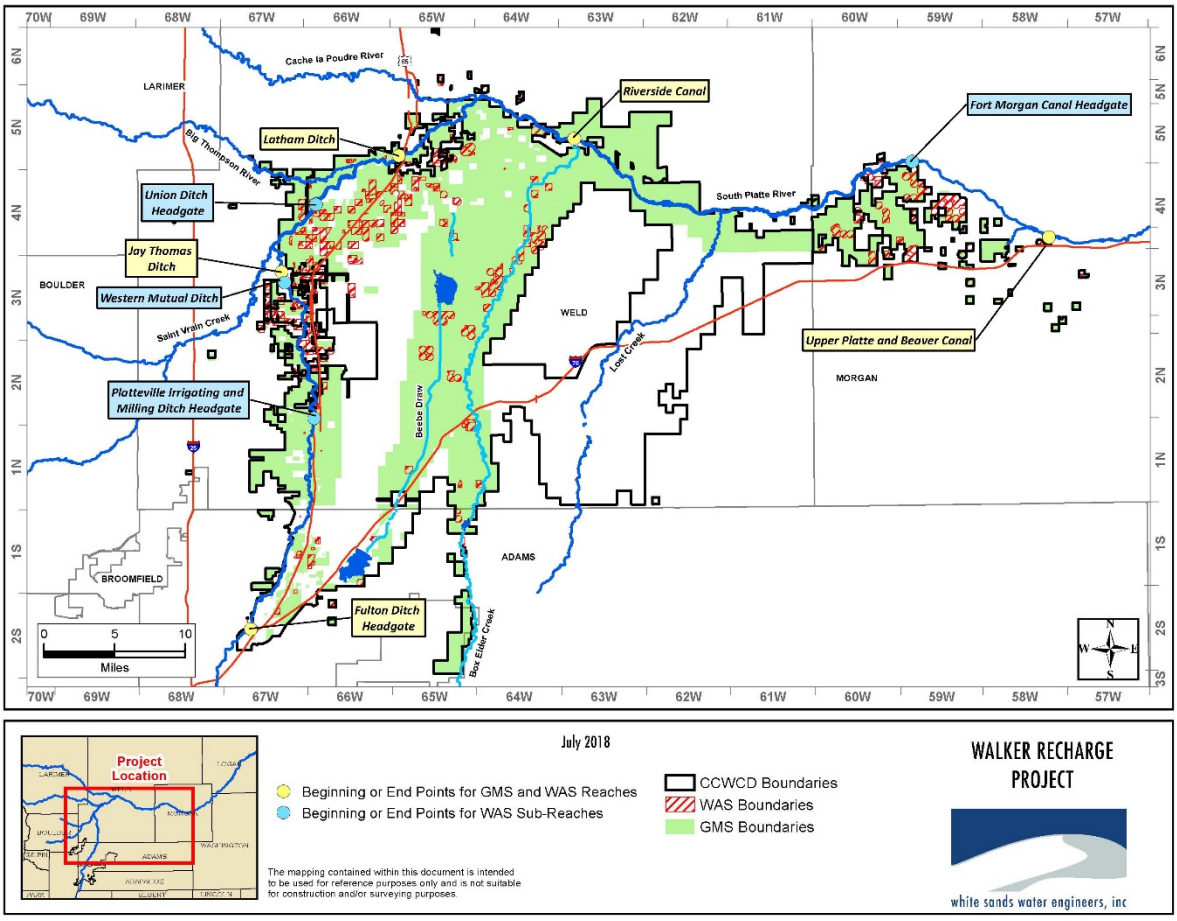

Figure 2. Boundaries of Central, WAS and GMS

Replacement water is made available to constituents of GMS and WAS through Class B, C and D contracts. GMS allotment contracts currently total approximately 67,000 acre-feet (af) and WAS contracts currently total approximately 15,000 af. All current contracts are defined in terms of a volume of consumptive use which has been quantified based on a needs assessment for the lands identified in each contract. Current GMS and WAS irrigation contracts identify approximately 75,000 acres of irrigated land, and roughly one-half of the total area relies solely on groundwater for irrigation supplies. GMS and WAS may authorize additional contracts at the request of landowners within its boundaries and with approval of their respective Board of Directors.

The GMS and WAS plans for augmentation are operated and accounted for using administrative river reaches along the South Platte River that extend approximately from the headgate of the Fulton Ditch at the upper end, to the headgate of the Upper Platte & Beaver Canal on the lower end (**Figure 3**). There are six decreed reaches identified in the GMS plan, and 10 decreed reaches identified in the WAS plan.

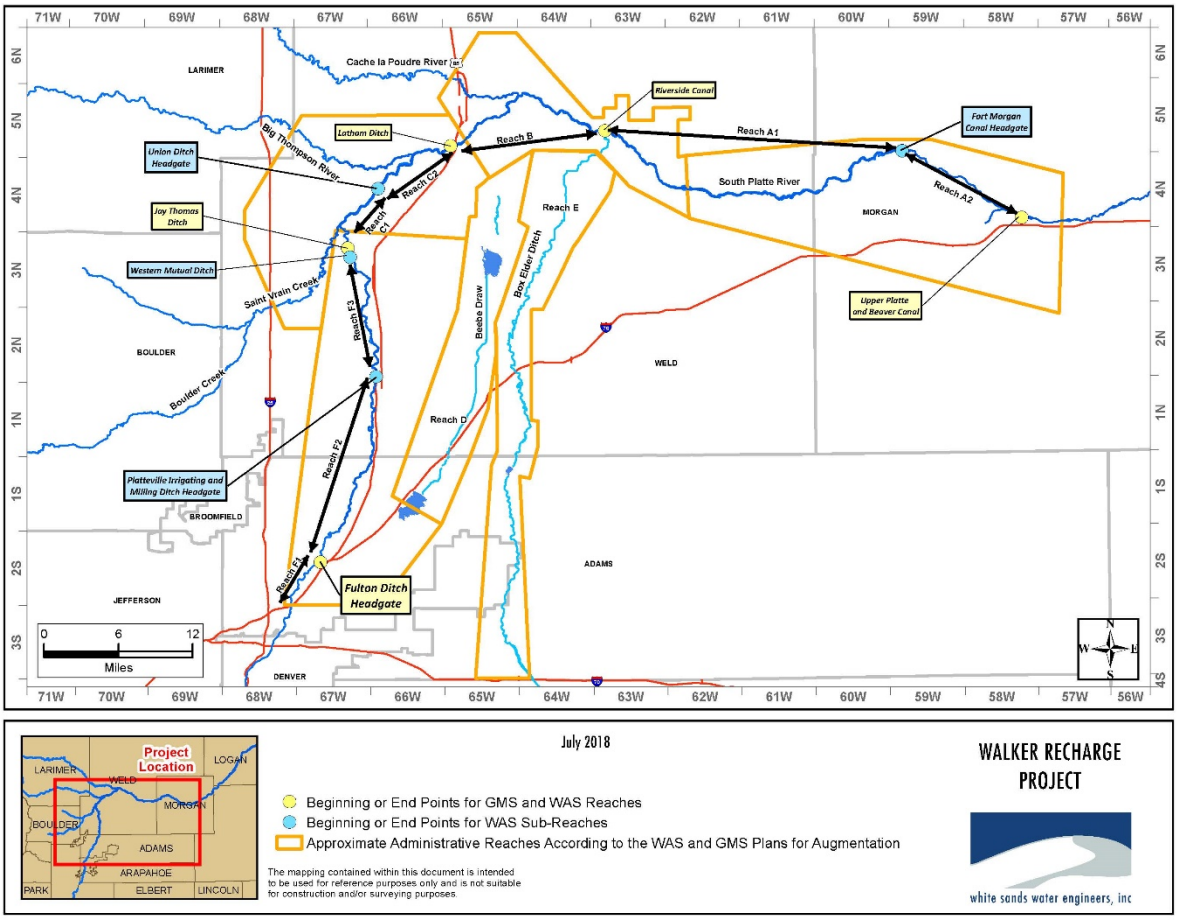

Figure 3. Augmentation Plan Administrative Reaches

The location of the depletive effect of pumping for each GMS and WAS well is assigned to one of these administrative reaches. The approximately 82,000 ac-ft of GMS and WAS contracts is distributed across reaches as shown in **Figure 4**. Aggregation into administrative river reaches provides Central an efficient means to manage replacement supplies and depletions associated with a large number of wells.

By statute the Central District has authority to issue water delivery allotment contracts to meet any water demand within its District boundaries. To date, the Central District has contracted to deliver relatively small amounts of water because its priority and focus has been development of water supplies for its subdistrict augmentation plans (GMS and WAS).

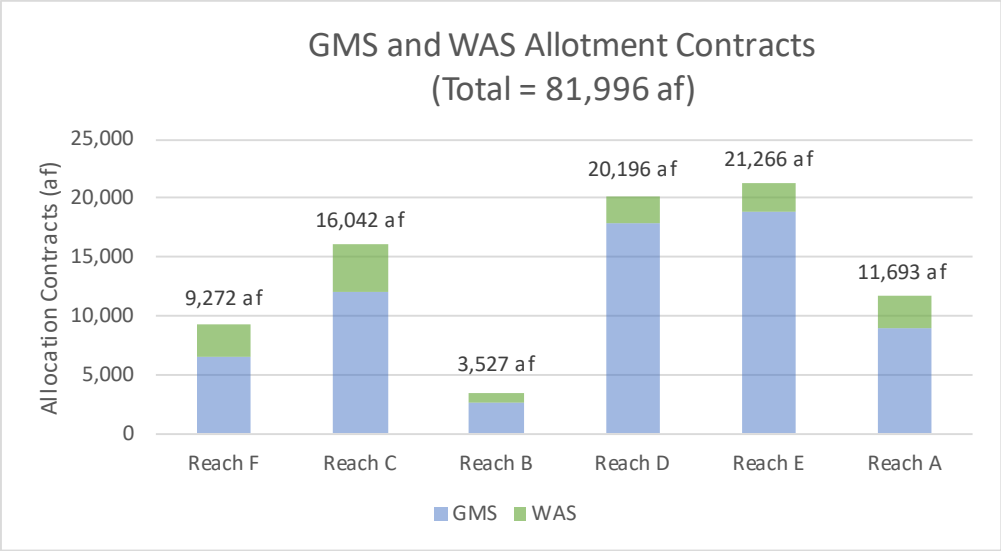

Figure 4. Geographic Distribution of GMS and WAS Allotment Contracts

On an annual basis both GMS and WAS issue a "quota" to its constituent member wells. The quota is a percentage of each member's contracted augmentation supply amount and is an allocation of overall GMS and WAS augmentation supplies. The annual quota is determined by comparing available supplies to well pumping depletions over a multi-year scenario. Recent annual quotas have averaged only about 50 percent, i.e., curtailments of about 50 percent. The annual quota depends heavily on amounts of water GMS and WAS have been able to recharge in prior years and available water in storage at the beginning of each irrigation season.

Throughout the year GMS and WAS continuously operate their water rights to supply augmentation supplies for its constituent wells. During the irrigation season, augmentation supplies come from changed direct flow water rights, storage releases, and recharge accretions. During the non-irrigation season the augmentation supplies are primarily storage releases and recharge accretions. Fully consumable water may also be available for lease on a short-term basis.

3 Need for Additional Water Supplies

3.1 Central's Current and Future Water Demands

As discussed in **Section 2** of this report, current GMS and WAS allotment contracts total approximately 82,000 af per year. However, existing demands for water supplies within the District and subdistricts exceed amounts currently contracted by GMS and WAS. Requests are routinely made to both GMS and WAS to provide additional augmentation supplies. While Central, GMS and WAS have the authority to issue additional allotment contracts, very few have been authorized in recent years. Instead, Central has focused on developing additional augmentation supplies so that existing contracts can routinely rely on 100 percent annual allocations.

A majority of the water rights owned by Central have junior priorities. Reliably supplying demands using junior water rights requires substantially higher volumes of water. For example, water may only be available to fill junior storage rights along the South Platte River an average of one out of three years. This means that roughly three times the contracted delivery amount must to be captured during wet periods to provide a full supply every year. Inevitable system operational losses require that even greater amounts to be captured during wet periods.

3.2 Location and Timing of Water Needs

As noted previously, GMS and WAS allotment contracts are distributed geographically between Denver and Fort Morgan. While most GMS and WAS member wells are used during the irrigation season for agricultural purposes, the delayed response of well pumping on surface streams creates a year-around demand for augmentation supplies. Differences in well locations and alluvial aquifer characteristics result in different seasonal patterns of depletions between the different reaches (**Table 1**). For all reaches combined, approximately 62 percent of depletive effects from pumping occurs during the irrigation season, and 38 percent occurs during the non-irrigation season. Pumping by wells located in Reaches F, C, B and A result in longer and more steady, monthly depletions across the year. Pumping by wells located in Reaches D and E (Beebe Draw and Box Elder Creek drainages, respectively), effect the river more quickly resulting in more monthly variability across the year. **Figure 5** illustrates depletions within each administrative reach following a period of steady-state pumping.

Table 1
GMS and WAS Depletions at Steady State
(acre-feet)

Reach	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
F	685	695	732	814	903	924	902	839	762	702	658	656	9,272
C	1,221	1,231	1,275	1,375	1,476	1,508	1,491	1,425	1,341	1,272	1,216	1,212	16,042
B	267	268	274	291	318	331	333	322	304	286	271	262	3,527
D	1,330	1,410	1,627	2,056	2,295	2,318	2,143	1,822	1,518	1,293	1,128	1,257	20,196
E	1,424	1,496	1,703	2,130	2,429	2,451	2,269	1,929	1,593	1,355	1,192	1,295	21,266
A	923	920	932	964	993	1,017	1,027	1,021	1,005	983	958	950	11,693
Total	5,850	6,021	6,542	7,630	8,413	8,549	8,165	7,357	6,522	5,891	5,423	5,631	81,996

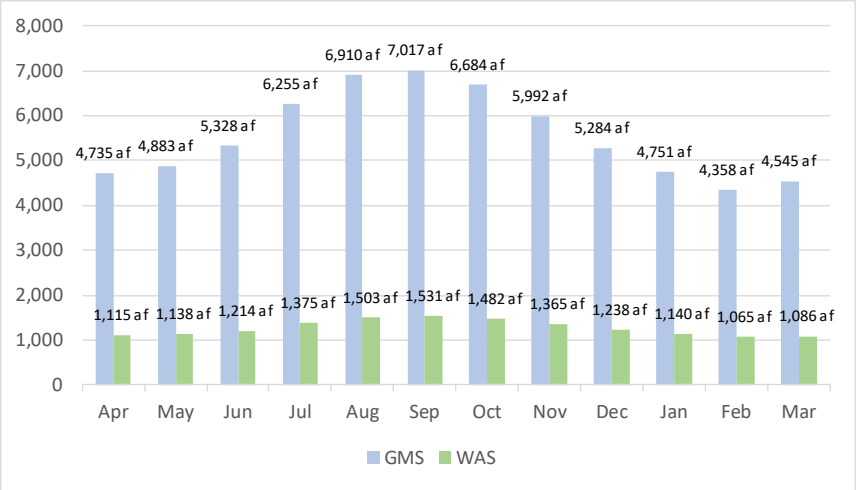

Figure 5. Seasonal Well Depletion Pattern (all reaches).

3.3 Comparison of Central's Supplies and Demands

Central's water supplies include changed senior rights, junior storage, recharge and exchange rights, and leased supplies. Changed senior rights comprise a relatively small, but important component of Central's water rights portfolio. Collectively between GMS and WAS, senior rights contribute approximately 8,000 af per year. A majority of the rights are located in Water District 2 (South Platte River above the Bijou Canal), Water District 3 (Cache la Poudre River), and Water District 6 (Boulder Creek). These rights are instrumental in providing supplies during the irrigation season but are not available during the non-irrigation season. In fact, return flow maintenance during the non-irrigation season for these changed rights increases Central's overall obligation during the winter.

As noted above, approximately 38 percent (31,000 af) of depletions from pumping Central's member wells during the irrigation season impact the river during the winter months. Central's junior recharge and storage water rights provide both irrigation season and non-irrigation season supplies but are particularly important during the winter months. Central's existing reservoirs have storage rights that total approximately 28,000 af, although because the rights are junior, the yield of these reservoirs is expected to be substantially less.

Central operates multiple recharge projects along the South Platte River between Denver and Fort Morgan. Recharge is vital component of both irrigation and non-irrigation season supplies but again, since the recharge rights are junior, yield can vary significantly between years. An advantage of recharge operations, as compared to reservoir storage, is that they re-time supplies from wet periods to drought periods and avoid evaporative losses. Recharge projects are also significantly more cost effective than development of additional storage capacity. A disadvantage to recharge is that once water is delivered into the alluvial aquifer, the timing of accretions cannot be controlled, and some portion may return to the river when unneeded.

Central has relied on numerous leases, primarily from municipal water providers for many years. These leases are typically for fully consumable effluent but have also included shares in various irrigation ditch companies. In recent years these leases have become increasingly difficult to obtain as municipal interests have developed means to recapture and use their effluent. Currently Central leases approximately 15,000 af per year, but all current leases expire within the next eight years.

Firm yield of Central's current portfolio of water rights can be estimated in two ways. First, an estimate can be made by considering combined annual well pumping quotas potentially issued by GMS and WAS but excluding all leased supplies. This exercise indicates Central's existing water rights, at their existing level of development, can support well pumping quotas on the order of 4,000 to 8,000 af; this is likely an overly conservative estimate because it assumes very little yield from junior water rights. A second way to estimate firm yield of existing rights considers anticipated yield based on the seniority of the rights. This would suggest a firm yield on the order of 40,000 af but is likely overly optimistic because it does not consider operational and facility constraints. A reasonable estimate of the firm yield of Central's water rights portfolio is somewhere in between, perhaps between 15,000 af and 20,000 af.

3.4 GMS and WAS Decree Requirements – Projected Operations

The GMS and WAS augmentation plan decrees require projections of future operations to demonstrate that sufficient water supplies will be available to fully replace out-of-priority well depletions. The projections require the assumption of a continuous downstream senior call, and drought conditions throughout the projection period. The projection concept, i.e., comparing future water supplies to future replacement obligations, is shown in **Figure 6**.

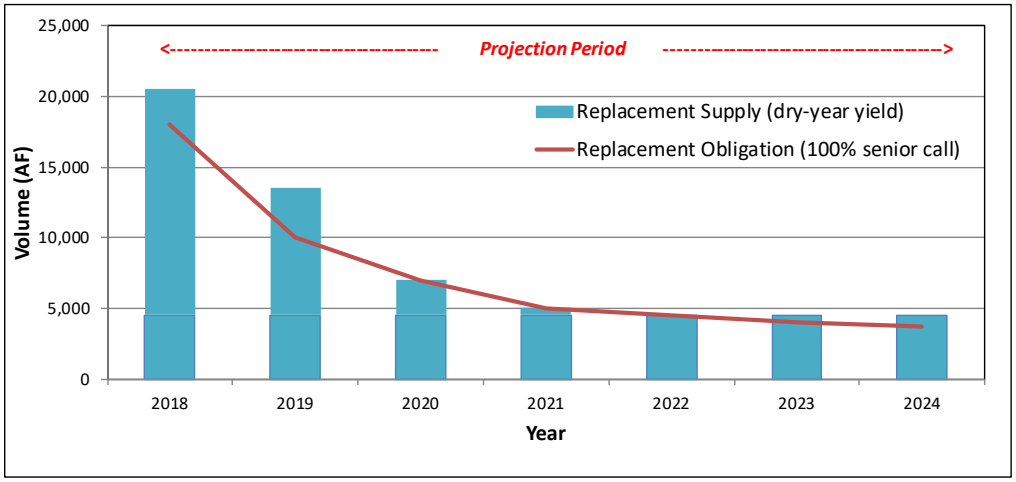

Figure 6. Example Projection (Supply vs. Replacement Obligation).

It should be noted from **Figure 6** that although there are projected excess water supplies in the first two projection years, later years of the example projection control the amount of additional well pumping that Central can authorize. Since both projected supplies (dry-year conditions) and projected replacement obligation (year around call) are unusual conditions, Central typically has more than sufficient replacement supplies during actual operations (at the annual quotas they have been able to authorize).

The GMS and WAS projection tools required by the augmentation plan decrees have severely restricted constituent well pumping. In recent years GMS has been able to authorize annual quotas ranging from only 25 to 65 percent because of decree requirements, i.e., curtailments of 35 to 75 percent. Projection requirements in the WAS decree have resulted in well curtailment ranging from 40 to 100 percent.

Operation of the GMS and WAS plans for augmentation and specifically the projections required by their respective decrees, emphasize the need for Central to develop long-term projectable replacement water supplies consistent with the amount and timing of depletions from well pumping. Because of the delay in accretions to the river, recharge operations provide a good opportunity to develop longer term supplies.

4 Water Availability

A daily point flow model (Excel spreadsheet) was developed to evaluate water availability at the Walker Recharge Project. The model reflects a study period from October 1, 1998 to December 31, 2015 and examines streamflow in the South Platte River from the streamflow gage near Kersey, Colorado to the streamflow gages at Julesburg, Colorado.

River reaches were defined based on locations of historical streamflow measurement gages. Within each river reach (between historical streamflow stations), gains or losses were calculated by subtracting the upstream gage and any inflow within the reach and adding any diversions within the reach from/to the downstream gage.

Gain or Loss = Downstream Gage – Upstream Gage – Inflows + Diversions

The resulting gain or loss was then reallocated across the model points within each river reach based on river distance between the streamflow gages.

Accuracy of point flow estimates is limited because of inaccuracies present in historically measured inflows and outflows and because of transit time in the river between upstream and downstream points. Three simplifying assumptions were incorporated into the model to address these inaccuracies. First, calculated point flows at a given location were set to zero flow at times when a call was historically placed at that location (diversion structure). Second, point flows were also set to zero flow if negative point flows were calculated. Finally, a 100 cfs flow "buffer" was incorporated whereby the calculated point flows were reduced by the flow buffer amount. The flow buffer accounts for inaccuracies in historical measurements and travel time, but also addresses fully consumable water that was historically in the river that may be lawfully captured upstream (and may not be available for diversion in the future).

Historical administrative calls from water rights on the South Platte River downstream of the Walker Recharge Project were incorporated into the point flow analysis to determine whether a junior water right could divert, regardless of the physical water availability. At times of downstream senior calls, point flows at the Walker Recharge Project were set to zero. Water available to divert by the Walker Project was defined as the minimum point flow between the headgate for the Weldon Valley Ditch and the Julesburg streamflow gaging stations downstream, and as constrained by a 100 cfs diversion rate.

Results of our analysis to examine water availability are shown in **Table 2**. Central is proposing an annual volumetric limit on diversions by the Project from the South Platte River of up to 30,000 af. Our results indicate 30,000 af may be available for diversion in some years. However, because the Project will operate under a junior water right priority, little or no water will be available during extreme drought periods. Since all water diverted from the river will be retimed through recharge operations, long term average accretions generated by the Project should approach 14,000 af per year and provide Central with a firm supply of several thousand acre-feet.

Table 2.

Water Available for Diversion at the Walker Project

Available Flow (AF) Flow Buffer = 100 cfs														
Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Volume Limited
1999	6,149	2,579	4,357	6,149	5,554	1,899	793	6,149	5,951	2,186	5,915	5,951	53,631	30,000
2000	6,149	5,951	6,149	6,149	5,752	6,149	2,259	-	-	-	-	-	38,557	30,000
2001	-	-	1,245	4,532	5,517	95	2,963	1,902	947	404	-	125	17,730	17,730
2002	-	488	357	1,833	704	650	-	-	-	-	-	-	4,031	4,031
2003	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2005	-	-	-	-	-	-	-	-	2,803	-	-	-	2,803	2,803
2006	-	-	-	-	40	69	-	-	-	-	-	-	109	109
2007	-	-	12	-	778	-	639	5,021	2,167	-	-	-	8,616	8,616
2008	-	-	273	2,300	46	-	-	-	-	-	-	-	2,620	2,620
2009	-	-	960	-	-	-	251	-	5,083	1,785	253	56	8,388	8,388
2010	3,092	4,742	6,149	3,590	-	2,708	3,236	5,752	5,355	-	-	-	34,624	30,000
2011	-	-	-	4,830	3,166	-	-	2,316	5,951	6,006	486	907	23,662	23,662
2012	436	1,368	5,560	6,149	5,752	2,747	-	-	-	-	-	-	22,012	22,012
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	0
2014	4,227	206	4,137	6,149	4,340	4,740	-	1,151	5,951	686	3,368	1,404	36,358	30,000
2015	5,452	5,951	6,149	6,149	3,963	6,036	1,653	6,149	5,951	6,058	410	-	53,918	30,000
2016	2,478	5,114	4,877										12,469	12,469
Min	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Max	6,149	5,951	6,149	6,149	5,752	6,149	3,236	6,149	5,951	6,058	5,915	5,951	53,918	30,000
Avg	1,555	1,466	2,235	2,813	2,095	1,476	694	1,673	2,362	1,007	614	497	17,752	14,024

5 Walker Recharge Project

The Walker Recharge Project will divert water from the South Platte River using up to four wellfields and three surface diversion structures located near the town of Orchard. The Project includes constructing facilities to divert and pump water south and east through pipelines to numerous recharge ponds. Water delivered into the recharge ponds percolates into the underlying tributary alluvial aquifer, then accretes back to the South Platte River over a period of months or years depending on recharge site geologic characteristics and locations. Diversions by the Project will occur under junior priority water rights generally when high flow conditions exist in the River, but diversions can also occur if Central or Project partners have excess fully consumable water in the River. Accretions during times of low flow conditions will be used as augmentation credits when there is a senior demand for water downstream and Central's upstream alluvial wells would otherwise be curtailed.

The Project will operate under a decree entered by the District Court, Water Division 1 in Case No. 16CW3032. Diversions from the South Platte River at rates up to 50 cfs, pumping from the alluvial aquifer at rates up to 50 cfs, and combined volumes up to 30,000 af per year will be delivered to recharge ponds up to five miles from the South Platte River.

5.1 Phased Construction of the Project

Construction of the Walker Project will occur in two or more phases. Phase 1 of the Project includes development of one well field, one surface water diversion structure, approximately 7,500 feet of pipeline and two or more recharge ponds (**Figure 7**). Phase 2 of the Project includes construction of an additional surface diversion and conveyance pipeline under the South Platte River, and pipelines to deliver water to additional recharge sites. Subsequent phases of the Project will include development of additonal well fields, surface diversion structures, pipeline networks and additional recharge sites. Phase 1 is expected to be completed within three to four years. Phase 2 may be initiated before completion of Phase 1, and is expected to take approximately three to four years to complete. Central expects full development of the Project will occur over the next 10 to 15 years.

5.2 Phase 1 Infrastructure Components

South Side Well Field and Southside Collector Manifold

The Phase 1 well field (South Side Well Field No.2) will consist of up to 4 alluvial wells. The wells will be located within approximately 100 feet of the South Platte River channel. One of the wells was constructed during 2017 but is not currently equipped with a pump. It is anticipated that the wells will be spaced approximately 200 to 250 feet apart. Vertical turbine or submersible turbine pumps will be installed in each well. A flow meter will be installed at the discharge of each pump to measure flow rates and volumes of water pumped per State of Colorado requirements. The well pumps will provide adequate pressure to deliver water to the Phase 1 and Phase 2 recharge ponds.

Water from the wells at Wellfield No. 2 will be pumped into a collector manifold pipe. The manifold pipe will then feed into the Southside Main Pipeline to convey water south to the Empire Recharge Pond (south side of the South Platte River).

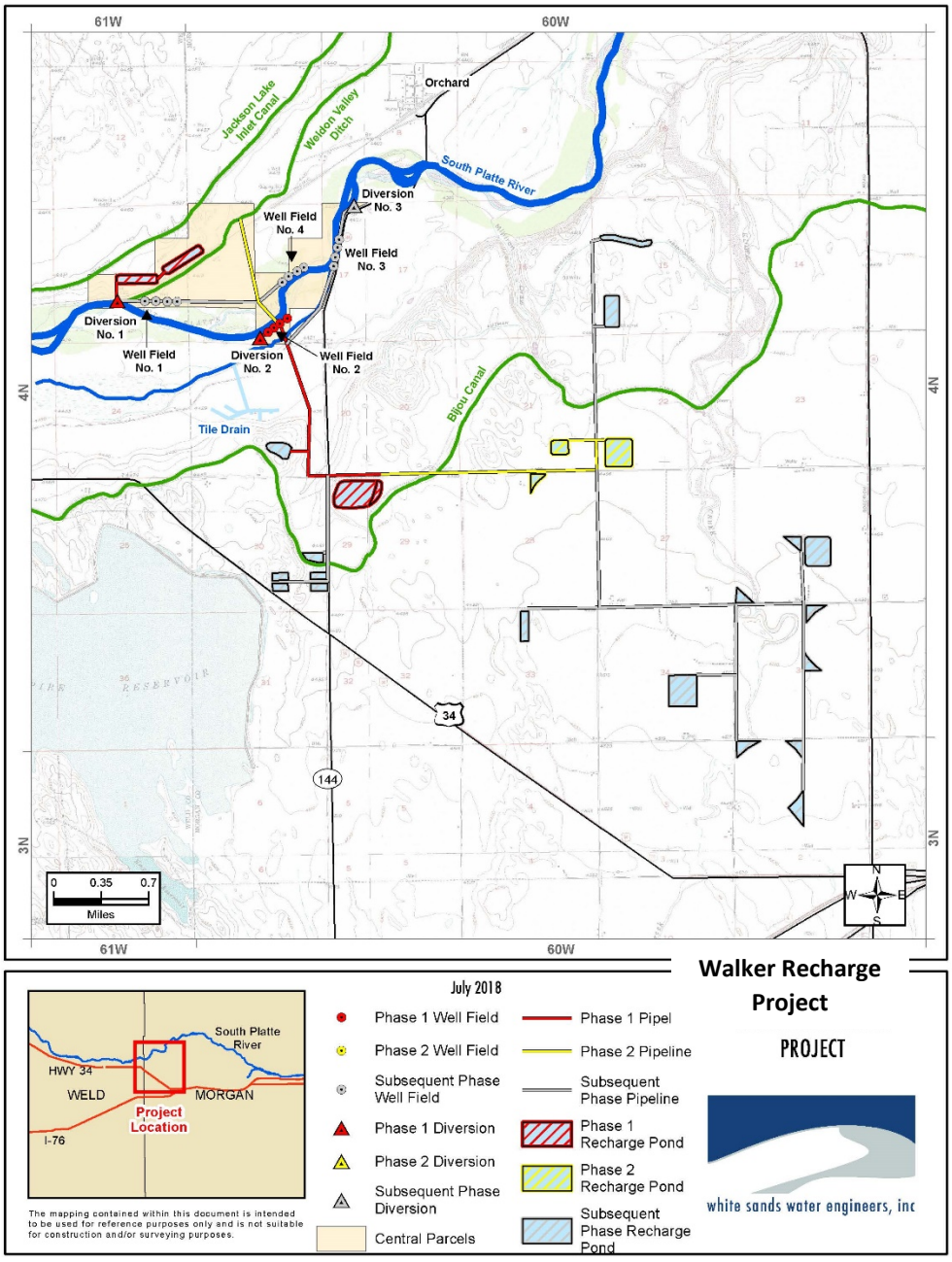

Figure 7. Phased Components of Walker Recharge Project

South Side Main Pipeline

The South Side Main Pipeline will be the main pipeline to connect diversion infrastructure on the South Platte River to the recharge ponds and recharge pond distribution system south of the River. The pipeline will collect water diverted from both the alluvial well fields and surface diversions points (including wells and diversion points on the north and south sides of the River). The main appurtenances planned for the pipeline include surge protection equipment to be installed at the control building, outlets to forebays and recharge ponds along the pipeline route, and booster stations as hydraulically required.

The pipeline may consist of either one large diameter pipeline or two smaller diameter pipelines installed in parallel. The final configuration will be determined as the system engineering and design progresses. The pipeline will discharge to the Empire Recharge Pond in Phase 1 and will be extended to additional recharge ponds to the east and south in future phases of Project construction.

South Recharge Ponds

Phase 1 recharge ponds will be located near the intersection of State Hwy 144 and Morgan County Road U. The ponds may be located on either or both sides, of Hwy 144. Up to 50 acres of recharge ponds will be constructed during Phase 1. Unlined recharge ponds will typically be approximately 4 ft deep with 4:1 side slopes and a flat bottom. Ponds will be excavated to a depth below the top soil. Top soil will be stock piled and then placed on the berms of the ponds, and berms will be seeded with native grasses. Recharge ponds will be designed to accommodate site topography and may be terraced. Water control structures will be constructed between the recharge ponds as necessary to control the water depth in each pond. Sedimentation basins may also be included to manage sedimentation removal.

South Project Shop and Control Building

The South Project Shop and Control Building will be located near the entrance to the Walker Property on the south side of the South Platte River on Morgan County Road V. This location is above the flood plain of the South Platte River. Control panels and variable frequency drives for the Phase 1 alluvial well pumps will be housed in this building. Space will be provided within the building to accommodate future pump control panels for pumps required to pump water from the surface diversions into the South Side Main Pipeline. The building may also house surge control equipment for the South Side Main Pipeline. The building will contain space for a shop and maintenance equipment for the Project. Central is currently in discussions with Morgan County Rural Electric Association concerning supplying three-phase electric power at the South Project Shop and Control Building.

North Side Surface Diversion No. 1, Recharge Pipelines and Recharge Ponds

The North Side Surface Diversion, Pipeline and Recharge Ponds will initially be constructed for the purpose of providing replacement water supplies for depletions resulting from the pumping of the Project alluvial wells. It is anticipated that the existing diversion infrastructure at the Weldon Valley Ditch headgate will

be utilized or modified to accommodate a pump station to lift water from the River, pressurize and deliver water into a pipeline for conveyance to recharge ponds. Several locations are under consideration for the recharge ponds, both to the north of the Weldon Valley Diversion or directly east. The final design (size and capacity) of this infrastructure will be determined as other engineering investigations and design phases of the Project are completed. The recharge ponds will be constructed per the guidelines described above for the South Recharge Ponds. Note that in Phase 2 of the Project, additional infrastructure will be developed so that water diverted at the North Side Surface Diversion No. 1 may be delivered into a collector system on the north side of the River and piped under the River to south side recharge ponds.

5.3 Phase 2 Infrastructure Components

North Side Surface Diversion No. 1

A surface diversion using the existing Weldon Valley Ditch diversion infrastructure will consist of a headgate structure on the Weldon Valley Ditch between the existing diversion structure on the South Platte River and flow measurement structure. It is anticipated that the headgate structure will be located approximately 1 mile downstream of the diversion headgate. The headgate structure will convey water to pump station that will pump water from the canal into the North Side main pipeline. The pump controls will be located in a pump house building. Other appurtenances that maybe installed in the pump house building include hydraulic surge protection equipment, flow meters, air vents, isolation valve, etc. The pump station will be sized to provide adequate pressure to deliver water to the planned Phase 1 and 2 recharge ponds.

North Side Trunk Line and South Platte River Bore

The North Side Main Pipeline will connect the Northside Surface Diversion No. 2 pump station to the South Platte River Crossing pipeline. A pipeline across the South Platte River will be required to convey water from the North Side Diversion No. 1 to the South Side main pipeline. A horizontally bored HDPE pipeline under the river is anticipated.

Additional South Side Distribution System and Recharge Ponds

This pipeline will extend the South Side Main pipeline from the Empire Pond east approximately two miles to proposed recharge ponds on the north and south side of County Road U. This pipeline must cross the Bijou Canal, and three county roads. Four potential recharge pond locations have been identified. The pipeline will be installed thru Morgan County Road ROW's and easements through private lands.

All recharge ponds will be located on lands that are currently privately owned. It is anticipated that each pond will be designed per the design guidelines described. A flow measurement device, turnout gate or valve, and conveyance from the distribution pipe will be required for each recharge pond. Up to 65 acres of recharge ponds have been identified for this phase of construction.

5.4 Future Phases of Project Development

Development of the Project following construction of Phase 1 and Phase 2 will extend into the future for several years. Central envisions a roughly 15-year Project build out.

South Side Well Field No. 3 and North Side Well Field Nos. 1 and 4

Additional well fields near the South Platte River have been identified for future development; two on the north side of the South Platte River and one on the south side. The well fields will be very similar to South Side Well Field No. 2 described above. An additional control building may be required to accommodate the pump controls and variable frequency drives for these well fields.

Surface Diversion Nos. 2 and 3

Several potential locations have been investigated for development of two additional surface diversion structures on the south side of the South Platte River. Several approaches to diverting surface water are under consideration. One method under consideration is the use of floating intake screens that can be deployed into the river when water is physically and legally available to divert. Pumps would be located on the bank next the River. Multiple pumps and floating intakes are anticipated for a single diversion site. It is anticipated that the pumps, meters, and controls will be located on the bank next to the point of diversion. The second type of diversion is to locate a structure along a naturally occurring cut-bank where surface water will gravity flow into a wet well and then be pumped to a collection pipeline. Sedimentation is a concern for both types of surface diversions, and a sedimentation basin or other method to manage sedimentation may be required. The final design in later phases of the Project will be based on a complete hydraulic analysis to determine the feasibility of various diversion approaches and in consideration of permitting requirements and costs.

Interconnecting Pipelines

A network of pipelines will be required to connect the surface diversions and well fields to the South Side Mainline Pipeline. Up to 50,000 feet of additional trunk lines and interconnecting pipelines are contemplated for the Project. These pipelines will occur primarily through easements on private land and on County Road Right-of-Ways.

The pipeline to connect Surface Diversion No. 2 to the southern infrastructure will be straight forward because it will be located near Well Field No. 2 and the start of the South Side Main Pipeline. The pipeline to connect Well Field No. 3 and Surface Diversion No. 3 may require additional easements through the property owned by the Bureau of Reclamation northwest of the intersection of Hwy 144 and Morgan County Road V.

A booster pump station will be required to pressurize a pipeline to distribute water to recharge ponds located to the east and south of the intersection of Morgan County Road 3 and Morgan County Road U. The booster pump station will be sized based on the final design of the distribution pipeline delivering

water to the south and east. The final size of the booster pump will be determined upon completion of the pipeline size, length, and capacity.

Dispersed Recharge Ponds

All Project recharge ponds will be located on lands that are currently privately owned. It is anticipated that each pond will be designed per the design guidelines described. A flow measurement device, turnout gate or valve, and conveyance from the distribution pipe will be required for each recharge pond. Up to 250 acres of recharge ponds may eventually be constructed.

5.5 Project Costs

Preliminary costs have been developed for Phase 1 and Phase 2 components of the Project, although there is still uncertainty at this preliminary design stage in pipeline sizing and power requirements for pumps. The cost estimate for completing Phase 1 of the Project is currently $7.699 million (**Table 3**). The cost estimate for completing Phase 2 is currently $10.466 million. Additional detail concerning Phase 1 and Phase 2 costs is provided in **Appendix A**. These costs include fees for engineering design and a 10 percent contingency. Central anticipates entering into a Design-Build delivery arrangement for Phase 1 of the Project during the latter part of 2018 or early 2019. Phase 1 will be completed within 3 to 4 years. Phase 2 and subsequent phases of the Project will be completed thereafter over a period of approximately 10 years.

In 2016 Central spent $666,000 on acquisition of real property associated with the Walker Project. Since acquiring the property, Central has invested approximately $750,000 in drilling and other site investigations, and engineering and geologic analysis. Funds invested to date on the Walker Project have come from cash reserves, budgeted operations money received from property tax collections, and revenues received from leasing available storage space in Central's existing reservoir to outside entities.

Major future expenditures associated with the Project will be for legal, engineering, construction, equipment, electrical power and site work. Rights-of-way and easements will need to be established for construction of many of the various infrastructure components. The most expensive components of the Project will be construction of well fields, surface diversions, pipelines, and recharge ponds. Equipment costs will also be substantial, for example submersible pumps at the well fields, booster pumps and control systems.

The Walker Project will be funded through a combination of sources from Central, GMS and WAS. Funding from each of the districts will be in proportion to their ownership of the Project. Currently it is anticipated that Central will own 15 percent of the Project, GMS will own 65 percent, and WAS will own 20 percent. Water made available from operating the project will be divided between the districts in the same proportions.

Funding by the Central district will be through cash reserves, grant monies provided by the USBR and the State of Colorado, and funds from debt approved by voters in 2012. Enterprise revenues generated from

periodic leases of reservoir storage space and water supplies may also be a funding source. Central has the ability to budget operating funds from their District property tax collections toward the completion of the Walker Project.

Funding of the Project by the GMS subdistrict will come from grants, additional bond funds or long-term debt, depending on results of ballot questions to voters during the public elections of November 2018. GMS's Water Enterprise Fund, which relies on GMS member assessments and water sales, may also be used as a funding source.

The WAS subdistrict will rely on grant monies to fund the Project and has voter approval for additional long-term debt. This is previously approved debt will be repaid with property tax collections reserved only for debt repayment.

Central, GMS and WAS are also involved with several local water providers regarding their financial participation in the Project. There has been considerable outside interest, although no final agreements have been reached. It is most probable that outside interests would participate in funding development of later phases of the Project.

Long-term operational and maintenance costs of the Project will be funded through district tax collections and member assessments.

Cash contributions to the Project from Central, GMS and WAS will be approximately $3.164 million, which represents approximately 17 percent of the costs to complete Phase 1 and Phase 2. These figures include the $1.5 million in proceeds to be received from the U.S. Bureau of Reclmation and the Colorado Water Plan grants. Central, GMS and WAS are seeking to borrow the remaining $15.0 million from the Colorado Water Conservation Board Water Project Loan Program. Central, GMS and WAS are each separately requesting loans. The term of the loans would be 30 years at an annual interest rate of 1.75 percent (the three loan applications are provided as **Appendix B-1, B-2** and **B-3** for Central, GMS and WAS, respectively).

Central, GMS and WAS have a long history of successfully financing and building water development projects in Morgan, Weld and Adams counties. Central has worked successively with CWCB on several prior loans to finance other water development projects.

Table 2.
Walker Project Cost Estimates and Funding Sources

Project Costs

Phase 1		
Land Acquisition	$	666,000
Preliminary Engineering Investigations	$	750,000
Phase 1 Design-Build	$	6,282,600
Phase 1 Completion Estimate	**$**	**7,698,600**
Phase 2		
Preliminary Engineering Investigations		$100,000
Phase 2 Design-Build	$	10,365,600
Phase 2 Completion Estimate	**$**	**10,465,600**
Total	**$**	**18,164,200**

Project Funding

Phase 1 Funding			*Ownership of Project ==>*	**Central** 15%	**GMS** 65%	**WAS** 20%	**Total** 100%
Land Acquisition	$	666,000		$ 99,900	$ 432,900	$ 133,200	$ 666,000
Central - CIP	$	750,000		$ 112,500	$ 487,500	$ 150,000	$ 750,000
BuRec Grant	$	750,000		$ 112,500	$ 487,500	$ 150,000	$ 750,000
CWP Grant	$	750,000		$ 112,500	$ 487,500	$ 150,000	$ 750,000
CWCB Loan	$	4,782,600		$ 717,390	$ 3,108,690	$ 956,520	$ 4,782,600
Total	**$**	**7,698,600**		$ 1,154,790	$ 5,004,090	$ 1,539,720	$ 7,698,600

Phase 2 Funding			*Ownership of Project ==>*	**Central** 15%	**GMS** 65%	**WAS** 20%	**Total** 100%
Central - CIP	$	248,200		$ 37,230	$ 161,330	$ 49,640	$ 248,200
CWCB Loan	$	10,217,400		$ 1,532,610	$ 6,641,310	$ 2,043,480	$ 10,217,400
Total	**$**	**10,465,600**		$ 1,569,840	$ 6,802,640	$ 2,093,120	$ 10,465,600

Total Funding	**$**	**18,164,200**

Total CWCB Loan	**$**	**15,000,000**	$ 2,250,000	$ 9,750,000	$ 3,000,000	
Central/GMS/WAS Funding	**$**	**3,164,200**	$ 474,630	$ 2,056,730	$ 632,840	
		17%	17%	17%	17%	

6 Alternatives Analysis

6.1 No Action

Under this alternative Central, GMS and WAS would not develop the Walker Recharge Project and continue to rely on its existing infrastructure and water rights to provide water supplies to constituent members. This alternative is unacceptable because it does not result in development of additional water supplies. As discussed above, additional water supplies are needed by Central, GMS and WAS.

6.2 Reduced Capacity Infrastructure

Under this alternative, Central, GMS and WAS would develop the Project at a reduced scale, e.g., limit construction to only Phase 1. A scaled-down version of the Project infrastructure would include fewer diversion structures along the South Platte River, smaller pipelines and pump stations, and fewer recharge ponds. When diversion and recharge opportunities arise, the amount of legally and physically available water potentially captured and retimed would be significantly reduced. This alternative is unacceptable because the it does not develop sufficient additional water supplies. In addition, reductions in costs for a reduced scale project would not be substantial in comparison to the reduction in project yield, resulting in much higher costs per acre-foot of developed water supply.

6.3 Preferred Alternative - Proposed Phase 1 and Phase 2 Infrastructure

The alternative preferred by Central, GMS and WAS is to construct the Phase 1 and Phase 2 facilities described above. Development of the Project is at full build out will result in an average annual yield of approximately 14,000 af. Estimated costs associated with the project are anticipated to result in a water supply development cost of approximately $1,350 per af excluding operations and maintenance costs.

7 Financial Information

7.1 Central

In 2017 the Central Colorado Water Conservancy District's total annual revenues were $7.447 million, and revenues are projected to be $11.729 million in 2018. Funds are obtained by Central from both tax revenues (Weld, Morgan and Adams counties) and assessments paid by GMS and WAS for use of the District's water rights and infrastructure. Central's revenues are used to purchase, lease and develop water rights.

Comparative financial information for Central over the period 2013 – 2017 is shown in **Table 4**. Detailed financial statements and reports from an independent auditor for the years 2015 - 2017 are provided as **Appendix B-1.** Central's financial budget for 2018 is provided as **Appendix D-1**.

Table 4
CCWCD - Comparative Historical Financial Information

CCWCD	2017	2016	2015	2014	2013
Assessed Valuation	$2,825,025,289	$4,125,374,230	$3,387,137,770	$2,546,758,328	$2,243,796,620
Mill Levy	2.004	1.533	1.737	1.887	1.856
Operations - All Funds					
Property & Specific taxes	$ 5,660,338	$ 6,311,827	$ 5,883,002	$ 4,812,450	$ 4,265,834
Other Revnues	$ 1,787,123	$ 29,172,826	$ 439,433	$ 589,330	$ 30,920,541
Total Revenues	$ 7,447,461	$ 35,484,653	$ 6,322,435	$ 5,401,780	$ 35,186,375
Total Expenditures	$ 10,951,124	$ 39,789,545	$ 10,830,763	$ 4,856,405	$ 6,163,205
Excess (deficiency) of Revenues	$ (3,503,663)	$ (4,304,892)	$ (4,508,328)	$ 545,375	$ 29,023,170
Financial Position					
Cash & Investments	$ 36,547,681	$ 32,661,438	$ 27,318,350	$ 28,874,959	$ 29,173,524
Water, Property & Equipment	$ 96,181,529	$ 90,060,621	$ 14,951,410	$ 12,809,959	$ 12,499,611
Total Liabilities	$ 60,786,922	$ 61,133,174	$ 32,389,570	$ 32,163,189	$ 31,521,720
Total Net Assets	$ 61,274,184	$ 52,375,542	$ 9,961,444	$ 9,521,301	$ 10,112,040

Central maintains three separate funds for purposes of their financial operations: 1) the General Fund is used to fund daily operations at Central including salaries and benefits of staff, and to acquire water rights and develop water storage and recharge projects, 2) the Water Enterprise Fund is used to develop storage and recharge project, and 3) the Debt Service Fund is used to repay loans and other debt that may be carried by Central. Property taxes are generally used to supply the General Fund and the Debt Service Fund, whereas member assessments are used to supply the Water Enterprise Fund.

Central's water supply projects are funded through their General Fund, their Water Enterprise Fund, and/or through loans and grants. For example, several projects have been and are being developed through grants obtained from the U.S. Bureau of Reclamation, U.S. Department of Agriculture's Agricultural Water Enhancement Project (AWEP), and grants made available through the Colorado Water Plan.

Central is seeking to borrow $2.25 million from CWCB. Over a 30-year period at an interest rate of 1.75 percent, annual loan payments are expected to be approximately $97,000. Information concerning Central's ability to repay the loan from CWCB is provided as **Appendix E-1**.

7.2 GMS

In 2017 the Groundwater Management Subdistrict's total annual revenues were $4.683 million, and revenues are projected to be $6.298 million in 2018. Funds are obtained by GMS from both tax revenues (Weld, Morgan and Adams counties) and annual Class B, C and D member assessments for the GMS plan for augmentation. GMS' revenues are used to purchase, lease and develop water rights, as well as to operate the annual augmentation plan.

Comparative financial information for GMS over the period 2013 – 2017 is shown in **Table 5**. Detailed financial statements and reports from an independent auditor for the years 2015 - 2017 are provided as **Appendix C-2.** GMS's financial budget for 2018 is provided as **Appendix D-2**.

Table 5
GMS - Comparative Historical Financial Information

GMS	2017	2016	2015	2014	2013
Assessed Valuation	$1,570,042,055	$2,405,120,830	$2,160,620,900	$1,542,160,719	$1,579,558,929
Mill Levy	1.583	1.232	1.319	1.301	1.319
Operations - All Funds					
Property & Specific taxes	$ 2,485,376	$ 3,054,689	$ 2,698,301	$ 1,980,615	$ 1,902,326
Water Assessments & Oher Revenue	$ 1,776,956	$ 1,491,465	$ 1,766,662	$ 3,160,993	$ 2,169,206
Total Revenues	$ 4,682,985	$ 5,044,874	$ 4,979,086	$ 5,141,608	$ 4,131,269
Total Expenditures	$ 4,325,859	$ 4,118,919	$ 3,197,185	$ 4,442,274	$ 3,534,935
Excess (deficiency) of Revenues	$ 357,126	$ 925,955	$ 1,781,901	$ 699,334	$ 596,334
Financial Position					
Cash & Investments	$ 10,805,694	$ 10,431,702	$ 10,149,092	$ 9,937,215	$ 9,357,536
Water, Property & Equipment	$ 30,629,329	$ 28,642,623	$ 23,284,914	$ 25,206,771	$ 22,069,174
Total Liabilities	$ 17,543,270	$ 16,979,731	$ 19,021,816	$ 16,280,146	$ 18,958,259
Total Net Assets	$ 21,313,467	$ 19,705,699	$ 17,563,144	$ 16,035,588	$ 14,556,948

GMS maintains three separate funds for purposes of their financial operations: 1) the General Fund is used to fund daily operations at GMS including salaries and benefits of staff, and to acquire water rights and develop water storage and recharge projects, 2) the Water Enterprise Fund is used to fund operations of the GMS plan for augmentation, and specifically water leases (ditch shares, recharge, effluent), and 3) the Debt Service Fund is used to repay loans and other debt that may be carried by GMS. Property taxes are generally used to supply the General Fund and the Debt Service Fund, whereas member assessments are used to supply the Water Enterprise Fund.

GMS' water supply projects are funded through their General Fund, their Water Enterprise Fund, and/or through loans and grants. For example, several projects have been and are being developed through grants obtained from the U.S. Bureau of Reclamation, U.S. Department of Agriculture's Agricultural Water Enhancement Project (AWEP), and grants made available through the Colorado Water Plan.

GMS is seeking to borrow $9.75 million from CWCB. Over a 30-year period at an interest rate of 1.75 percent, annual loan payments are expected to be approximately $421,000. If debt repayment is funded solely through member assessments, this would require assessment increases of approximately $6.50 per af, or roughly a 26 percent increase. Information concerning GMS's ability to repay the loan from CWCB is provided as **Appendix E-2**.

7.3 WAS

In 2017 the Well Augmentation Subdistrict's total annual revenues were $3.208 million, and revenues are projected to be $7.683 million in 2018. Funds are obtained from both tax revenues (Weld, Morgan and Adams counties) and annual Class B, C, and D member assessments for the WAS plan for augmentation. WAS' revenues are used to purchase, lease and develop water rights, as well as to operate the annual augmentation plan.

Comparative financial information for WAS over the period 2013 – 2017 is shown in **Table 6**. Detailed financial statements and reports from an independent auditor for the years 2015 - 2017 are provided as **Appendix C-3.** WAS's financial budget for 2018 is provided as **Appendix D-3**.

WAS maintains three separate funds for purposes of their financial operations: 1) the General Fund is used to fund daily operations at WAS including salaries and benefits of staff, and to acquire water rights and develop water storage and recharge projects, 2) the Water Enterprise Fund is used to fund water leases (ditch shares, recharge, effluent), and 3) the Debt Service Fund is used to repay loans and other debt that may be carried by WAS. Property taxes are generally used to supply the General Fund and the Debt Service Fund, whereas member assessments are used to supply the Water Enterprise Fund.

WAS' water supply projects are funded through their General Fund, Water Enterprise Fund, and/or through loans and grants. For example, several recharge projects have been developed through grants

obtained from the U.S. Bureau of Reclamation, the U.S. Department of Agriculture's Agricultural Water Enhancement Project (AWEP) and grants made available through the Colorado Water Plan.

WAS is seeking to borrow $3.00 million from CWCB. Over a 30-year period at an interest rate of 1.75 percent, annual loan payments are expected to be approximately $130,000. If debt repayment is funded solely through member assessments, this would require assessment increases of approximately $8.50 per af, or roughly a 13 percent increase. Information concerning WAS's ability to repay the loan from CWCB is provided as **Appendix E-3**.

Table 6
WAS - Comparative Historical Financial Information

WAS	2017	2016	2015	2014	2013
Assessed Valuation	$ 161,153,562	$ 348,235,200	$ 256,163,100	$ 168,884,269	$ 168,884,269
Mill Levy	9.019	9.355	9.000	9.000	9.000
Operations - All Funds					
Property & Specific taxes	$ 1,453,444	$ 3,252,123	$ 2,363,313	$ 1,655,099	$ 1,787,076
Water Assessments & Other Revnue	$ 976,204	$ 977,817	$ 1,308,560	$ 1,027,708	$ 862,596
Total Revenues	$ 3,207,542	$ 5,067,893	$ 3,896,295	$ 3,386,969	$ 2,871,139
Total Expenditures	$ 2,640,192	$ 2,980,566	$ 2,272,129	$ 2,220,831	$ 1,847,157
Excess (deficiency) of Revenues	$ 567,350	$ 2,087,327	$ 1,624,166	$ 1,166,138	$ 1,023,982
Financial Position					
Cash & Investments	$ 6,883,479	$ 6,819,263	$ 5,051,299	$ 3,654,947	$ 3,288,606
Water, Property & Equipment	$ 20,043,254	$ 18,896,597	$ 16,064,896	$ 16,223,213	$ 15,754,409
Total Liabilities	$ 14,986,721	$ 15,518,278	$ 18,287,638	$ 17,383,862	$ 16,928,577
Total Net Assets	$ 9,398,209	$ 8,840,619	$ 6,196,321	$ 4,805,655	$ 3,639,518

8 Loan Request, Credit Worthiness, and Collateral

Central, GMS and WAS are requesting individual 30-year loans totaling a combined $15.0 million. This amount relects an estimated $18.164 million cost of the Project less contributions by Central, GMS and WAS totaling $3.164 million (17 percent).

Central sought input concerning their ability to repay debt from George K. Baum & Company and requested a credit worthiness rating from Standard & Poor's Ratings Services concerning financial feasibility (**Appendices E-1, E-2 and E-3**).

Collateral for this loan will be in the form of the water supply project, i.e., Walker Recharge Project facilities, developed with the loan funds.

Proceeds from this CWCB loan may provide substitute funding for water supply projects that would otherwise be funded by a long-term bond issuance funded though district debt service funds. This would mean that repayment of the loan is guaranteed because it has already been approved by District voters (taxes to service the debt will be collected).

9 Conclusions

The Central, GMS and WAS Boards of Directors have determined that the Walker Recharge Project is an essential component of their water supply infrastructure future and necessary for long-term operations and economic security. This report provides a description of how funds from a CWCB loan would be used, the probable benefit to Central, GMS and WAS, and the financial capacity of Central, GMS and WAS to repay loans from CWCB.

10 Limitations

This document was prepared for Colorado Water Conservation Board in accordance with professional standards at the time the services were performed and in accordance with a contract between White Sands Water Engineers, Inc. and Central Colorado Water Conservancy District. The document is governed by the specific scope of work authorized by Central and is not intended to be relied upon by any other party. White Sands Water Engineers, Inc. makes no warranties, express or implied, with respect to this document. Any party that relies on this document, except those authorized herein or under the terms of the contract between Central and White Sands Water Engineers, Inc. does so at its own risk. Further, we have relied on information or instructions provided by Central and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Appendix A
Project Cost Estimates

Walker Recharge Project - Phase 1
Preliminary Opinion of Probable Cost
Summary

Item No.	Improvement Description	Cost
1	North side SP River Diversion/Pipeline/5 Acre Recharge Pond	$160,000
2	Wells/Pumps/Manifold Pipe/Controls	$2,532,500
3	36" Pipeline from Well Fields to Empire Pond	$2,367,000
4	10 Acre Empire Recharge Pond	$176,000
	Sub-Total	$5,235,500
	Engineering/Permitting - 10% Contingency - 10%	$523,550 $523,550
	Total	$6,282,600

Walker Recharge Project - Phase 1
Summary Item No. 1
Detailed Preliminary Opinion of Probable Cost
South Platte River Diversion/Pipeline/Recharge Pond

5-29-2018 Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Floating Intake, Meter, Pipeline, Pond				
12" River Screen w/ Suction Pipe	EA	1	$10,000	$10,000
Piping w/ Connection to Portable Pump and Meter	LS	1	$5,000	$5,000
Meter	EA	1	$5,000	$5,000
12" PVC Fill Pipeline	LF	1000	$75	$75,000
Excavate 5 Acre-Pond, 5 ft. deep	CY	15000	$4	$60,000
Inlet Protection at Pond	LS	1	$5,000	$5,000
Total				**$160,000**

Walker Recharge Project - Phase 1
Summary Item No. 2
Detailed Preliminary Opinion of Probable Cost
Well Field 2/Well Pumps/Manifold Pipe/Controls - Opinion of Probable Cost

7-11-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Well, Submersible Turbine Pump, 250 HP				
Well	Ea	4	$90,000	$360,000
Well Pump 2000-3000 gpm pump w/ 250 hp motor	EA	4	$130,000	$520,000
Discharge pipe, meter, check valve, air vent	EA	4	$20,000	$80,000
Sub - Total				**$960,000**
Manifold Pipe, Collection Pipe, 36-inch 50 cfs				
Manifold Pipe	LF	900	$150	$135,000
Collection Pipe, 36-inch PVC	LF	800	$225	$180,000
Isolation Valve	EA	4	$2,500	$10,000
Slough Crossing	LS	1	$20,000	$20,000
Sub - Total				**$325,000**
Surge Protection, 36" Pipeline, 50 cfs				
8000 gallong Surge Tank	EA	1	$165,000	$165,000
Surge Tank Installation	EA	1	$82,500	$82,500
pipe/valves	LS	1	$100,000	$100,000
				$347,500
Electrical/Controls/Building				
New Box Culvert in Slough, 24 wide 4' high, 20' wide w/ Conduit Ba	LS	1	$200,000	$200,000
Electric - McNeil, VFD's, Conduit, Conductors, building electric	EA	4	$100,000	$400,000
Well Field 2 Control Building	EA	1	$300,000	$300,000
Sub Total				**$900,000**
Total				**$2,532,500**

Walker Recharge Project - Phase 1
Summary Item No. 3
Detailed Preliminary Opinion of Probable Cost
Pipeline from Well Fields 2 to Empire Pond

7-11-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
36" Pipeline				
36" PVC Pipeline	LF	7900	$250	$1,975,000
Air Vents	EA	12	$5,000	$60,000
Directional Fittings	EA	10	$12,000	$120,000
Isolation Valve	EA	1	$10,000	$10,000
Bored Casing Under SH-144	LF	80	$1,000	$80,000
CR Crossing	LF	120	$100	$12,000
Easements, 11,000 LF	LF	11000	$10	$110,000
Total				**$2,367,000**

Walker Recharge Project - Phase 1
Summary Item No. 4
Detailed Preliminary Opinion of Probable Cost
Empire Recharge Pond

5-25-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Empire Recharge Pond, 10 Acres				
Recharge Ponds (5 ft. deep, 30 ft. top bank width)	CY	30,000	$4	$120,000
Inlet Structure	EA	1	$30,000	$30,000
Overflow Pipe between Sedimentation Pond and Recharge Pond	LF	160	$100	$16,000
Reseed Berms	Acres	10	$1,000	$10,000
Total				**$176,000**

Walker Recharge Project - Phase 2
Preliminary Opinion of Probable Cost
Summary

Item No.	Improvement Description	OPC
1	Weldon Valley Ditch Check Structure, 50 CFS Pump Station	$2,897,500
2	Weldon Valley Ditch Bypass Structure	$364,000
3	36" Pipeline from Weldon Valley Ditch Diversion to Bored Pipe	$759,000
4	Bore Under South Platte River	$1,570,000
5	36" CR-U Pipeline Extention from Empire Pond to Wiggins South P	$2,085,000
6	Recharge Ponds along CR U, (55 Acres - Net)	$962,500
	Sub-Total	$8,638,000
	Engineering/Permitting - 10%	$863,800
	Contingency - 10%	$863,800
	Total	$10,365,600

Walker Recharge Project - Phase 2
Summary Item No. 1
Detailed Preliminary Opinion of Probable Cost
South Platte River Surface Diversion - Weldon Valley Ditch

6-15-2018 Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Pump Station\weldon valley ditch check structure (50 cfs)				
10 CFS, 350 HP, Vetical Turbine Pump	EA	5	$250,000	$1,250,000
Concrete Check Structure w/Wet Well	CY	150	$2,500	$375,000
Headgate (3x5)	EA	1	$15,000	$15,000
Piping	LS	1	$100,000	$100,000
Meter	EA	1	$10,000	$10,000
Controls	EA	5	$100,000	$500,000
Electrical Service	EA	1	$100,000	$100,000
Pump House/Control Building	EA	1	$200,000	$200,000
8000 gallong Surge Tank	EA	1	$165,000	$165,000
Surge Tank Installation	EA	1	$82,500	$82,500
pipe/valves	LS	1	$100,000	$100,000
Total				**$2,897,500**

Walker Recharge Project - Phase 2
Summary Item No. 2
Detailed Preliminary Opinion of Probable Cost
Weldon Valley Ditch Bypass Structure

6-15-2018 Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Weldon Valley Ditch - Bypass Structure				
Concrete by-pass structure	CY	140	$2,000	$280,000
Headgates	EA	4	$15,000	$60,000
Earthwork	CY	3000	$8	$24,000
Total				**$364,000**

Walker Recharge Project - Phase 2
Summary Item No. 3
Detailed Preliminary Opinion of Probable Cost
Pipeline from Weldon Valley Ditch Diversion & Pump Station to Bored Pipe

7-11-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
36" Pipeline				
36" PVC Pipeline	LF	2900	$250	$725,000
Air Vents	EA	2	$5,000	$10,000
Directional Fittings	EA	2	$12,000	$24,000
Total				**$759,000**

Walker Recharge Project - Phase 2
Summary Item No. 4
Detailed Preliminary Opinion of Probable Cost
Direction Bore Under South Platte River - Opinion of Probable Cost

6-15-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
Bore Under South Platte River, 30-inch 50 cfs				
Directional Bore under the South Platte River	LF	1100	$1,150	$1,265,000
36-inch HDPE	LF	1100	$250	$275,000
Isolation Valve	EA	2	$15,000	$30,000
Air Vac Assemblies	EA	2	$10,000	$20,000
Total				**$1,570,000**

Walker Recharge Project - Phase 2
Summary Item No. 5
Detailed Preliminary Opinion of Probable Cost
Pipeline from Empire Pond to Wiggins Property

7-11-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
36" Pipeline				
36" PVC Pipeline	LF	10800	$130	$1,404,000
Air Vents	EA	12	$15,000	$180,000
Directional Fittings	EA	16	$12,000	$192,000
Isolation Valve	EA	3	$20,000	$60,000
CR-Crossings	LF	180	$100	$18,000
Easements, 11,000 LF	LF	11000	$10	$110,000
Excavation/Backfill Pipeline Under Canal	CY	1800	$20	$36,000
Import or Bentonite Clay Mix for Ditch Crossing Backfill	CY	500	$100	$50,000
Rip-Rap Bank Protection Over Crossing	CY	350	$100	$35,000
Total				**$2,085,000**

Walker Recharge Project - Phase 2
Summary Item No. 6
Detailed Preliminary Opinion of Probable Cost
Recharge Ponds - CR U Extension

5-25-2018, Wayne E. Eckas, P.E.

Improvement Description	Unit	Quantity	Unit $	$
CR - U Rercharge Ponds				
Peggram No. 1	Acres	10	$17,500	$175,000
Sieber	Acres	5	$17,500	$87,500
Newman	Acres	10	$17,500	$175,000
Wiggins South	Acres	30	$17,500	$525,000
Total				**$962,500**

Appendix B-1
CCWCD - CWCB Loan Application

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Project Loan Program

Projects financed by the Water Project Loan Program must align with the goals identified in Colorado's Water Plan and its measurable objectives.

Application Type

☐ Prequalification *(Attach 3 years of financial statements)* ☑ Loan Approval *(Attach Loan Feasibility Study)*

Agency/Company Information

Company / Borrower Name: Central Colorado Water Conservancy District

Authorized Agent &Title: Randy W. Ray, Executive Director

Address: 3209 West 28th Street Greeley, CO 80634

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Organization Type: ☐ Ditch Co, ☑ District, ☐ Municipality ☐ other: _____ | Incorporated? ☐ YES ☑ NO

County: Adams, Morgan, Weld | Number of Shares/Taps:

Water District: Conservancy District | Avg. Water Diverted/Yr _____ acre-feet

Number of Shareholders/Customers Served: | Current Assessment per Share $_____ (Ditch Co)

Average monthly water bill $ _____ (Municipality)

Contact Information

Project Representative: Randy W. Ray

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Engineer: Ed Armbruster

Phone: (303) 495-7576 | Email: ed.armbruster@whitesandswater.com

Attorney: Brad Grasmick

Phone: (970) 622-8181 | Email: brad@ljcglaw.com

Project Information

Project Name: Walker Recharge

Brief Description of Project: (Attach separate sheets if needed)

The Walker Recharge Project will divert water from the South Platte River using up to four well fields and three surface diversion structures located near the town of Orchard. The Project includes constructing facilities to divert and pump water south and east through pipelines to numerous recharge ponds. Water delivered into the recharge ponds percolates into the underlying tributary alluvial aquifer, then accretes back to the South Platte River over a period of months or years depending on recharge site geologic characteristics and locations.

Project Start Date(s) Design: February-March 2019 Construction: May-June 2019

General Location: (Attach Map of Area)

Location is in Weld and Morgan Counties between the towns of Orchard and Wiggins

Project Costs - Round to the nearest thousand

Estimated Engineering Costs: $1,500,000 | Estimated Construction Costs: $16,500,000

Other Costs (Describe Above): | Estimated Total Project Costs: $18,666,000

Requested Loan Amount: $2,250,000 | Requested Loan Term(10, 20, or 30 years): 30 Years

Signature

Signature / Title: Executive Director Date: 7/20/18

Return to: Finance Section Attn: Anna Mauss
1313 Sherman St #718
Denver, CO 80203
Ph. 303/866.3449
e-mail: anna.mauss@state.co.us

Appendix B-2
GMS - CWCB Loan Application

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Project Loan Program

Projects financed by the Water Project Loan Program must align with the goals identified in Colorado's Water Plan and its measurable objectives.

Application Type

☐ Prequalification *(Attach 3 years of financial statements)* ☑ Loan Approval *(Attach Loan Feasibility Study)*

Agency/Company Information

Company / Borrower Name: Groundwater Management Subdistrict

Authorized Agent &Title: Randy W. Ray, Executive Director

Address: 3209 West 28th Street Greeley, CO 80634

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Organization Type: ☐ Ditch Co, ☑ District, ☐ Municipality ☐ other: _____ | Incorporated? ☐ YES ☑ NO

County: Adams, Morgan, Weld | Number of Shares/Taps:

Water District: Conservancy District | Avg. Water Diverted/Yr _____ acre-feet

Number of Shareholders/Customers Served: | Current Assessment per Share $_____ (Ditch Co)

Average monthly water bill $ _____ (Municipality)

Contact Information

Project Representative: Randy W. Ray

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Engineer: Ed Armbruster

Phone: (303) 495-7576 | Email: ed.armbruster@whitesandswater.com

Attorney: Brad Grasmick

Phone: (970) 622-8181 | Email: brad@ljcglaw.com

Project Information

Project Name: Walker Recharge

Brief Description of Project: (Attach separate sheets if needed)

The Walker Recharge Project will divert water from the South Platte River using up to four well fields and three surface diversion structures located near the town of Orchard. The Project includes constructing facilities to divert and pump water south and east through pipelines to numerous recharge ponds. Water delivered into the recharge ponds percolates into the underlying tributary alluvial aquifer, then accretes back to the South Platte River over a period of months or years depending on recharge site geologic characteristics and locations.

Project Start Date(s) Design: February-March 2019 Construction: May-June 2019

General Location: (Attach Map of Area)

Location is in Weld and Morgan Counties between the towns of Orchard and Wiggins

Project Costs - Round to the nearest thousand

Estimated Engineering Costs: $1,500,000 | Estimated Construction Costs: $16,500,000

Other Costs (Describe Above): | Estimated Total Project Costs: $18,666,000

Requested Loan Amount: $9,750,000 | Requested Loan Term(10, 20, or 30 years): 30 Years

Signature

RWR Executive Director
Signature / Title 8/20/18 Date

Return to: Finance Section Attn: Anna Mauss
1313 Sherman St #718
Denver, CO 80203
Ph. 303/866.3449
e-mail: anna.mauss@state.co.us

Appendix B-3
WAS - CWCB Loan Application

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Project Loan Program

Projects financed by the Water Project Loan Program must align with the goals identified in Colorado's Water Plan and its measurable objectives.

Application Type

☐ Prequalification *(Attach 3 years of financial statements)* ☑ Loan Approval *(Attach Loan Feasibility Study)*

Agency/Company Information

Company / Borrower Name: Well Augmentation Subdistrict

Authorized Agent &Title: Randy W. Ray, Executive Director

Address: 3209 West 28th Street Greeley, CO 80634

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Organization Type: ☐ Ditch Co, ☑ District, ☐ Municipality ☐ other: _____ | Incorporated? ☐ YES ☑ NO

County: Adams, Morgan, Weld | Number of Shares/Taps:

Water District: Conservancy District | Avg. Water Diverted/Yr _____ acre-feet

Number of Shareholders/Customers Served: | Current Assessment per Share $_____ (Ditch Co)

Average monthly water bill $ _____ (Municipality)

Contact Information

Project Representative: Randy W. Ray

Phone: (970) 330-4540 | Email: rray@ccwcd.org

Engineer: Ed Armbruster

Phone: (303) 495-7576 | Email: ed.armbruster@whitesandswater.com

Attorney: Brad Grasmick

Phone: (970) 622-8181 | Email: brad@ljcglaw.com

Project Information

Project Name: Walker Recharge

Brief Description of Project: (Attach separate sheets if needed)

The Walker Recharge Project will divert water from the South Platte River using up to four well fields and three surface diversion structures located near the town of Orchard. The Project includes constructing facilities to divert and pump water south and east through pipelines to numerous recharge ponds. Water delivered into the recharge ponds percolates into the underlying tributary alluvial aquifer, then accretes back to the South Platte River over a period of months or years depending on recharge site geologic characteristics and locations.

Project Start Date(s) Design: February-March 2019 Construction: May-June 2019

General Location: (Attach Map of Area)

Location is in Weld and Morgan Counties between the towns of Orchard and Wiggins

Project Costs - Round to the nearest thousand

Estimated Engineering Costs: $1,500,000 | Estimated Construction Costs: $16,500,000

Other Costs (Describe Above): | Estimated Total Project Costs: $18,666,000

Requested Loan Amount: $3,000,000 | Requested Loan Term(10, 20, or 30 years): 30 Years

Signature

Randy W. Ray Executive Director
Signature / Title

7/20/18
Date

Return to: Finance Section Attn: Anna Mauss
1313 Sherman St #718
Denver, CO 80203
Ph. 303/866.3449
e-mail: anna.mauss@state.co.us

Appendix C-1

2015, 2016, 2017 (Draft) Financial Statements and Audit Reports of CCWCD

Appendix C-2

2015, 2016, 2017 (Draft) Financial Statements and Audit Reports of GMS

Appendix C-3

2015, 2016, 2017 (Draft) Financial Statements and Audit Reports of WAS

Appendix D-1
2018 Budget – Central

Appendix D-2
2018 Budget – GMS

Appendix D-3
2018 Budget – WAS

Appendix E-1

Opinion Concerning Financial Feasibility - CCWCD

George K. Baum & Company
INVESTMENT BANKERS SINCE 1928

July 25, 2018

Ms. Danyelle McCannon
Central Colorado Water Conservancy District
3209 W. 28th Street
Greeley, CO 80634

Re: $2.25 million CWCB Loan for Walker Project By e-mail and USPS

Dear Ms. McCannon:

We have been asked to express an opinion on the ability of the Central Colorado Water Conservancy District (CCWCD) to borrow and repay a proposed $2,250,000 loan from the Colorado Water Conservation Board (CWCB) to be taken down in 2017 or 2018.

CCWCD in 2012 received voter approval for the issuance of $60 million in general obligation bonds. CCWCD in 2013 issued a $29,250,000 general obligation bond. These bonds are rated by Standard & Poor's. The District in 2015 obtained a $28.4 million loan from CWCB which is payable annually at 1.75% over 30 years. The two financings effectively have used up the District's voter authorization.

CCWCD has the ability to finance the Walker project by issuing revenue bonds payable from an enterprise fund. The District revenue source for this fund amounted to over $800,000 in 2017. Of this amount, approximately $458,000 was received from the Water Enterprise Fund of the District, WAS and GMS. In addition to the $458,000 in revenues over $400,000 from leasing water rights was received by the District in 2017.

A loan in the amount of $2,250,000 from CWCB at 1.75% for 30 years would require an annual payment of $97,042 for principal and interest. Based on the aforementioned enterprise revenues, CCWCD has the financial wherewithal to undertake a CWCB loan in 2018 or 2019 in the amount of $2,250,000.

Based on this analysis and a review of the financial health and assessed valuation of the District, it is the opinion of George K. Baum & Company that a $2.25 million loan on the above terms can be repaid by the District.

Your comments or questions are welcome.

Sincerely,

Donald W. Diones

Donald W. Diones
Senior Vice President

Appendix E-2

Opinion Concerning Financial Feasibility - GMS

George K. Baum & Company
INVESTMENT BANKERS SINCE 1928

July 25, 2018

Ms. Danyelle McCannon
Financial Analyst
Groundwater Management Subdistrict
%Central Colorado Water Conservancy District
3209 W. 28th Street
Greeley, CO 80634

Re: $9.75 million CWCB Loan for Walker Project By e-mail and USPS

Dear Ms. McCannon:

We have been asked to express an opinion on the ability of the Groundwater Management Subdistrict (GMS) to borrow and repay a proposed $9,750,000 loan from the Colorado Water Conservation Board (CWCB) to be taken down in 2018 or 2019. It is our understanding the loan of $9,750,000 will be for 30 years at an interest rate of 1.75%.

GMS has an assessed valuation of $2,064,393,320 in 2017 for property taxes collected in 2018. With an annual levy of 3.0 mills the subdistrict can collect up to $6,193,180 in annual property taxes. The District currently levies 1.353 mills which results in the collection of $2,793,124 in property taxes. Of this amount $741,000 is currently collected for annual debt service which will be paid in full by 2028. GMS also receives revenue from water assessments which in 2017 amounted to $1,750,737. Assuming GMS receives a CWCB loan of $9,750,000 the annual payment will be about $421,000 for principal and interest which would require a levy of .204 mills.

In November 2018 GMS will ask voters to approve a $48.7 million bond issue. When approved, GMS will have the ability to service a CWCB loan of $9,750,000 payable from property taxes. Based on this analysis and a review of the financial health and assessed value of the Subdistrict, it is the opinion of George K. Baum & Company that a $9.75 million loan on the above terms can be repaid by the Subdistrict.

Your comments are welcome.

Sincerely,

Donald W. Diones

Donald W. Diones
Senior Vice President

Appendix E-3

Opinion Concerning Financial Feasibility - WAS

George K. Baum & Company
INVESTMENT BANKERS SINCE 1928

July 25, 2018

Ms. Danyelle McCannon
Financial Analyst
Well Augmentation Subdistrict
%Central Colorado Water Conservancy District
3209 W. 28th Street
Greeley, CO 80634

Re: $3.0 million CWCB loan for Walker Project By e-mail and USPS

Dear Ms. McCannon:

We have been asked to express an opinion on the ability of the Well Augmentation Subdistrict (WAS) to borrow and repay a proposed $3,000,000 loan for 30 years at 1.75% from the Colorado Water Conservation Board (CWCB) to be taken down in 2018 or 2019.

WAS has received voter approval to incur general obligation debt up to $39,000,000. To date it has issued a $16,000,000 bond issue leaving $23,000,000 in voter authorization. As part of the approval, the maximum annual debt payment WAS can incur is $2,885,000. Their current annual payment is about $785,000. With an assessed valuation of $299,926,727 in 2017 for property taxes collected in 2018 WAS could collect up to $2,699,340 for payment of principal and interest from their limit of 9 mills. WAS also has the authority to collect from its members water assessments which in 2017 amounted to $1,450,685.

It is our understanding WAS is requesting a $3,000,000 loan at 1.75% for 30 years. This would require WAS to levy .433 mills in order to pay about $130,000 for annual debt service.

Based on this analysis and a review of the financial health and assessed valuation of the Subdistrict, it is the opinion of George K. Baum & Company that a $3 million loan on the above terms can be repaid by the Subdistrict.

Any comments are welcome.

Sincerely,

Donald W. Diones

Donald W. Diones
Senior Vice President

white sands water engineers, inc