ARKANSAS RIVER AND WILDHORSE CREEK LEVEE REHABILITATION AND RECONSTRUCTION PUEBLO, COLORADO

COLORADO WATER CONSERVATION BOARD CONSTRUCTION LOAN FEASIBILITY STUDY

SPONSORED BY THE PUEBLO CONSERVANCY DISTRICT PO BOX 234 PUEBLO, CO 81002 www.PuebloLevee.ORG

FEASIBILITY REPORT PREPARED BY:



KIDD ENGINEERING AND CONSTRUCTION MANAGEMENT SERVICES, INC. 44811 E US HIGHWAY 50 AVONDALE, CO 81022

AND

111 E 5th STREET PUEBLO, CO 81003

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NORTHSTAR ENGINEERING AND SUR

PUEBLO CONSERVANCY DISTRICT

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TABLE OF CONTENTS

	3
PROJECT SPONSOR	4
PROJECT SERVICE AREA	5
DESIGN CRITERIA AND WATER RIGHTS	5
PROJECT DESCRIPTION AND ALTERNATIVES	5
IMPLEMENTATION	8
PERMITTING	9
FINANCIAL ANALYSIS	10
ECONOMIC ANALYSIS	11
CONCLUSIONS	11

APPENDICES

- APPENDIX A Vicinity Map Showing Project Area
- **APPENDIX B Downtown Flood Plain Primary Areas Affected**
- **APPENDIX C Construction Schedule**
- **APPENDIX D Audit Report for 2015**
- APPENDIX E Audit Report for 2014
- APPENDIX F Audit Report for 2013
- APPENDIX G- Financial Statement for April 2017 (2016 Audit in process)

INTRODUCTION

The impetus for forming the Pueblo Conservancy District was to provide flood protection and restoration of the City of Pueblo after the 1921 flood. The Pueblo Conservancy District was formed, after petition to the District Court, in 1923. The District was organized pursuant to the Conservancy District Law of Colorado, C.R.S. 37-1-101 et. seq. and is a political subdivision of the State. The Pueblo Conservancy District developed a plan for relocation of the Arkansas River and railroad lines and construction of a barrier dam and the levees. The bond funded construction was completed in March 1926. The construction of Pueblo Dam, completed in 1976, significantly reduced the flood hazard to the city of Pueblo, but FEMA hydrology and mapping indicate that virtually all of the downtown area, plus an area to the north west of downtown would be flooded from a 100-year recurrence interval storm if the levees would happen to fail. The area that would be subject to flooding hosts both City and County facilities, as well as transportation and communication systems that are essential to the protection of public safety, health and welfare. Services essential to the public health, safety and welfare would be impaired to a significant degree, if not completely disabled.

After Hurricane Katrina struck the Gulf Coast, which resulted in major flooding to the city of New Orleans, both the Corps of Engineers and FEMA were faulted. The Corps of Engineers was criticized for failure to assure that the levees were properly maintained and FEMA was criticized for a slow response to the event. As a result, the Corps and FEMA initiated a program of reviewing levees in the United States and updating the flood plain mapping. The Pueblo Conservancy District was advised, in 2006, that unless the Arkansas River and Wildhorse Creek levees were certified in accordance with 44 CFR 65.10 the City would lose its protected status. The District did not have money enough to embark on engineering studies and remedial construction work required to certify the levees to FEMA standards. The District had approximately \$1M in reserves and no income stream except for interest earnings.

Failures of the Arkansas River Levee foundation have been observed. Portions of the concrete cap have cracked, slipped, and buckled. In 2011 the District contracted for an emergency project to pump grout into large voids identified behind the concrete cap between drop structures 3 and 5. Any of the referenced conditions can result in potential failures of the concrete cap and the subgrade earth embankment. Even under low flow conditions, failure of the concrete cap can result in piping failures or wash-out of the earthen levee. So the Pueblo

Conservancy District was forced to either disband or develop an income source to allow for the work required to certify the levee system.

The Colorado Supreme Court held, in 1923, that the Conservancy District statute was constitutional and further held that the maintenance fee established by the statute is a fee and not a tax. Therefore, the Board of Directors petitioned the District Court to allow collection of a maintenance fund assessment. The petition was granted and the District has received maintenance fund assessment income collected by the Treasurer of Pueblo County with property tax collections since 2008, except for tax year 2011 which the District did not certify an assessment being due. The District is currently assessing a maintenance fund fee on all properties in Pueblo County, except for governmental and non-profit entities. The 2016 income from the assessment was \$1.1M. The District has the statutory authority to levy an assessment on the governmental and non-profit properties but has chosen not to do so.

In order to insure adequate funding availability, earlier in 2017 the District petitioned the supervising Court to allow increases in the maintenance fund assessment of up to 35 percent of the existing assessment levels. The District Court approved this petition. The maintenance fund assessment income stream will be used to pay off loan indebtedness and operations costs for the Pueblo Conservancy District.

PROJECT SPONSOR

The Pueblo Conservancy District is a political subdivision of the State of Colorado, organized pursuant to the Conservancy District Law of Colorado, C.R.S. 37-1-101 et. seq. It is governed by a nine member board of directors and its actions are under the supervision of the Pueblo District Court. The Statutes set forth the specific purposes of the Pueblo Conservancy District as they relate to floods and the methods of financing construction, maintenance and operations. Flood control is the main purpose of the District. In addition to this flood control purpose the Colorado Legislature amended the power of Conservancy Districts by expanding the purposes to include conservation of soils and other surface resources; studying, correcting and controlling natural and artificial pollution of surface and ground waters; encouraging and participating in the development of parks and recreation facilities within its boundaries. This amendment became effective April 7, 1994.

The City of Pueblo is participating with the District to construct enhancements and improvements along the Wildhorse Creek and Arkansas River corridor to increase accessibility, wildlife habitat, water based recreation, water contact opportunities, and wildlife viewing.

PROJECT SERVICE AREA

The project service area extends along Wildhorse Creek from 18th Street to the confluence with the Arkansas River, and then along the Arkansas to the outfall of Lake Runyon into the Arkansas. The length of the project area is 3.7 miles, and the area is 36 acres. The boundaries of the Pueblo Conservancy District include all of Pueblo County.

DESIGN CRITERIA AND WATER RIGHTS

FEMA hydrology studies have determined that the levee system must be designed for 100-year recurrence interval flood flow rates of 12,000 cfs in Wildhorse Creek and 40,000 cfs in the Arkansas River. Further, their studies provided flood water surface elevations for both the 100-year and 500-year storm occurrences. The National Flood Insurance Program levee certification requirements are provided in 44 CFR 65.10. This criteria includes requirements for: design base flood rates, freeboard, closures, embankment protection, embankment and foundation stability, settlement, interior drainage, and other design criteria as deemed applicable to the protection area.

The proposed enhancements are considered "non-consumptive use" of the water as it flows through Pueblo. The reach of the Arkansas River as it passes through Town receives the benefit of a recreational in-channel diversion (RICD) to support the fishing and whitewater park. This RICD is made possible, partly, by the volunteer flow program entered into by Colorado Springs Department of Public Utilities and the Pueblo Board of Water Works

PROJECT DESCRIPTION AND ALTERNATIVES

The Pueblo Conservancy District was created and is charged with the responsibility to provide flood protection for the City of Pueblo, and other floodplain protection tasks. While the Pueblo Dam provides flood control it does not provide complete protection as can be seen from the flood plain maps. In reviewing the property within the flood plain, there are a significant number of properties and facilities owned by the City or the County of Pueblo which provide essential public health, safety and welfare functions. The area also contains essential communication links and major links to the roadway system for emergency services. If there were no levee and there were a flood of

catastrophic proprtions there would be a major impact on the ability of law enforcement, fire, ambulance, communication and transportation which would place the health, safety and welfare of everyone in Pueblo County at some level of risk.

A sampling of the public properties that would be located in the flood plain maps if the levee were not certified to FEMA include (but are not limited to): the County Judicial Building; the City Municipal Building which is the headquarters for the City Police; the City owned Ice Arena and Municipal Auditorium which provide services and facilities for everyone in Pueblo County; the Pueblo Convention Center; the Historic Arkansas Riverwalk of Pueblo (HARP) which is maintained and operated by the HARP Authority, which is an entity created by an intergovernmental agreement among the City of Pueblo, Pueblo County, the Board of Water Works, the Pueblo Conservancy District and the Pueblo Urban Renewal Authority and provides a venue for community wide activities and entertainment; numerous City Departments, and agencies such as the Planning and Zoning Department and the Department of Public Works, which provide services which are predominantly a benefit to the residents and property owners in the City.

Four distinct alternatives were considered to remedy the levee issues in the engineering reports provided to the District. They were:

- 1. Take no action other than continued maintenance of the levee system.
- 2. Replace the entire height of the existing concrete panels.
- 3. Remove and replace the lower concrete panels of the Arkansas River Levee, approximately 20-feet in height.
- 4. Remove and replace only the lower 10-feet of the concrete panels, where the worse conditions were seen to exist.

And then there was a fifth alternative that was determined to be the best approach after detailed analysis and construction of a test section of the levee.

Alternative No. 1 – Continue with maintenance only: The threshold question is if there were no levee system would the community be at risk. Even if there is a levee which is maintained if it is not certified it will be treated, for the purpose of flood insurance as if it does not exist. Many real estate loans, for properties located in a flood plain, cannot be made without flood insurance. Unless the levees are certified the areas in the FEMA flood plain which have been considered to be protected by the levees, would no longer be considered as protected areas and thus the cost of flood plain insurance would escalate enormously. Therefore, not only does the community need the levee system and need the system maintained, the community needs the levees to be certified.

Alternative No. 2 – Replace entire height of concrete facing: Due to the existence of the Pueblo Reservoir, the capacity of the channel as currently surfaced is well in excess of capacity required for the 100 year design storm. Also, the condition of the existing concrete panels on the upper half of the levee is much better than the condition of the existing concrete panels on the lower portions of the levee. Therefore, it was determined that this alternative was excessive with respect to the certification requirements of FEMA.

Alternative No. 3 – Replace the lower 20-ft of concrete facing: This alternative proposes to replace all existing concrete panels and appurtenant improvements within the conveyance area for the 100 year design storm including freeboard. It also results in the replacement of existing improvements which display the greatest signs of cracking and buckling. This was the improvement alternative recommended by the Consultant Team prior to detailed analysis and construction of a test section of the levee.

Alternative 4 – Replace the lower 10-ft of concrete facing: This is the area where the worst conditions currently existed. Toe/footing failures and excessive cracking and buckling of the lower section of these panels were seen at various points along the levee. There are two major concerns the Consultant Team has with limiting the projected improvements to the lower 10' of the levee. First, that area does not appear to fully convey 100 year flow depths and freeboard. That could create some future concerns regarding levee certification. Second, the face of the levee (approximately 40 feet) is covered with concrete panels with a joint in the center (at approximately 20 feet). Replacement of the lower 10' would result in partial replacement of the lower panels. That would require significant saw cutting and other demolition activities potentially creating additional damage to the upper portion of the lower panels. Also, although not as significant, the upper portion of the lower panels do display signs of cracking and buckling.

Selected Alternative: Access to perform the work was a major hurdle to overcome. The top of the levee embankment was only six to ten feet wide. One solution was to construct a temporary platform that would allow heavy equipment to work on the removal and replacement of the concrete facing. The more viable and less costly solution was to remove the top 12-feet of the levee, thus providing a working area approximately 45-feet wide. With this, it was reasonable to then replace the full height of the remaining concrete facing rather than just 20-feet.

MPLEMENTATION

The first three phases of the construction have been completed. To date, we have completed the reconstruction and stabilization of a total of 6600 lineal feet of the Arkansas River Levee, from 11th Street to the Black Hills Energy – HARP Authority diversion structure. The top 12-feet of an additional 4400 lineal feet of the Arkansas Levee embankment has been removed, and some of the soils from this task were used to construct the 2800 lineal foot Wildhorse Creek Levee. A total of approximately \$11,000,000 has been spent to date for design, property acquisitions, and construction work on the Wildhorse Creek and Arkansas River levees.

The next construction phase will be Phase 4. This reach is 3300-feet long and will extend from the seventh drop structure to the railroad bridge above Santa Fe Avenue and I-25. The final design services contract has been awarded and it is hoped that financing can be arranged for the construction to begin in October of 2017. There will remain approximately 3900 lineal feet of Arkansas River Levee reconstruction and stabilization of 1500 lineal feet of steep slopes on the bluff side of the River. This will take at least two and possibly three more phases (Completion of entire project in 2021 or 2022.) of construction activity. The reason that this project is broken into so many phases is because the work can be done only in the winter time when the River flows are the lowest. The construction window is roughly November 15 through March 15. Based upon work completed to date, it is currently estimated that it will cost \$12M to complete all of this work. This will bring the total levee system rehabilitation and reconstruction cost to \$23M. This work will complete the requirements to meet the FEMA mandate for certification of the Arkansas River Levee.

However, there are opportunities to leverage the \$11M already expended and the \$12M of future work to enhance and improve the function of the Arkansas River corridor through Pueblo. All of the enhancements and improvements would be considered "non-consumptive use" of the water as it flows through Town. The existing levees have been in place for over 90 years. What we do now should serve for at least another 100 years. It is our belief that we should plan for and construct an enhanced river corridor that will be a legacy to leave for generations to come.

Potential enhancements/improvements include:

 Creation of stream habitat to improve aquatic environments in the Arkansas River from West 18th Street south to Lake Runyon wildlife area.

- Develop bird habitat and site locations for the Arkansas Valley Audubon Society to provide their environmental education and bird watching programs.
- Improve low-head dam structures to enhance the fishery habitat for species listed as potentially threatened or endangered. The improved dam structures will also provide whitewater recreation opportunities.
- Introduction of in-stream diversions for fishing and less intense recreation, such as tubing, floating and wading.
- Provide access from the Levee to the Arkansas River to improve angling access from the north-east side of the river.
- Enhance native vegetation throughout the area that will attract wildlife, including water fowl, shorebirds, game birds, raptors, large mammals, and small mammals.
- Develop overlook locations along the Levee to enhance wildlife viewing opportunities.
- Install interpretative signs along corridor to identify species of vegetation and wildlife in the immediate vicinity.
- Install steel bridges connecting the existing Arkansas River Trail to the new Levee Trail to provide neighborhood access and emergency service access to the Levee Trail and recreation opportunities in the river.

It is of special note that Senate Bill 17-073 requires the Pueblo Conservancy District, the City of Pueblo, and the Colorado Department of Parks and Wildlife to cooperatively work toward the development and enhancement of the Lake Runyon area. We have already cooperatively worked together on other enhancement and improvement activities along this corridor. Therefore, we believe that we will have the support of the State Legislature for grants that will support enhancements envisioned.

PERMITTING

We are currently operating under a Department of the Army 404 permit, issued from the Albuquerque Office of the Army Corps of Engineers. This permit includes compliance with requirements of the Colorado Historical Society. The requirements were set forth in a historical analysis prepared by SWCA and sent to the District by letter titled "Section 106 Review: Arkansas River Levee at Pueblo Rehabilitation Project, Pueblo County, Corps #SPA-2014-00471-SCO, HC#66926.

FINANCIAL ANALYSIS

The funds derived from the Pueblo Conservancy District's maintenance fund assessments can only be used for repair, maintenance, and operations of the District. The current estimate of probable costs to complete the minimum work necessary to stabilize the Levee embankment (7200 lineal feet) and the steep slopes along the bluff side (1500 lineal feet) of the River is \$12,000,000. The Pueblo Conservancy District is seeking a loan that will pay off the current \$10M loan and provide the additional \$12M that is needed to complete the reconstruction necessary to meet the FEMA mandate for certification of the Arkansas River Levee. The enhancements and improvements discussed above are a desired part of this project. The existing levees have been in place for over 90 years. What we do now should serve for at least another 100 years. Construction of an enhanced river corridor will be a legacy to leave for generations to come. The enhancement work, however, cannot be paid for with funding derived from the District's maintenance fund assessment. Therefore, the costs for those improvements will not be a part of the loan that we are requesting. The hope is that we will be able to secure grant funding, leveraging the monies spent for levee reconstruction, to design and construct the enhancements and improvements to the river corridor.

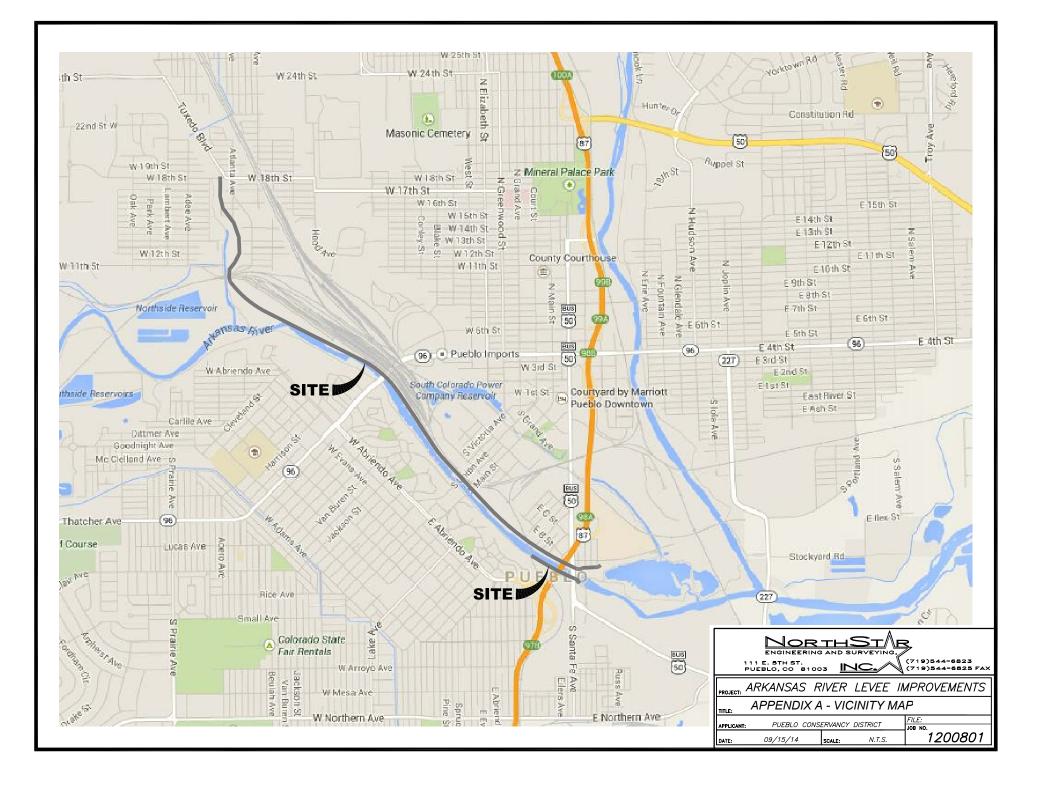
The Colorado Supreme Court held, in 1923, that the Conservancy District statute was constitutional and further held that the maintenance fee established by the statute is a fee and not a tax. The Pueblo Conservancy District did not have an income stream until the Board of Directors petitioned the District Court to allow collection of a maintenance fund assessment. The petition was granted and the District has received funding since 2008, except for tax year 2011 collected in 2012. The District is currently assessing a maintenance fund fee on all properties in Pueblo County, except for governmental and non-profit entities. The 2016 income from the assessment was \$1.1M. In 2017, the District petitioned the Court to allow the District's Board to increase in the maintenance fund assessment by up to 35-percent of the existing assessment. The petition was granted. The order granting that authority was signed on April 28, 2017. The maintenance fund assessment income will be used to pay back the requested loan and provide operation and maintenance funding for the District's activities. As noted, the District's Board can increase the cash flow to the District by including governmental and non-profit properties in the assessment levy and/or by increasing the existing assessment by up to 35%.

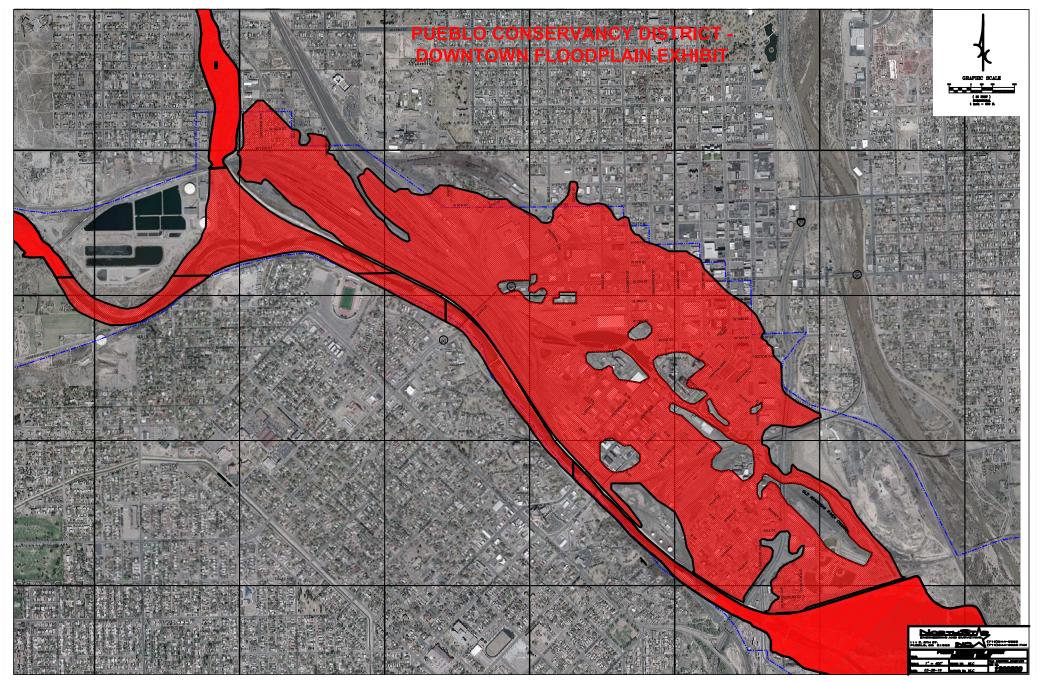
ECONOMIC ANALYSIS

The economic benefit of this project is enormous. The 1921 Flood caused an estimated \$16M of damages at that time. This would be over \$65M in today's dollars. The current flood plain mapping should the levees fail does not include all of the area inundated by the 1921 Flood, but it is very close to it. And there are millions of dollars of public and private structures that have been recently constructed within the currently mapped area with an additional \$20+ million dollar project to commence this year in the expansion of the existing convention center to include the Professional Bull Riders University together with a new parking garage.

CONCLUSIONS

- The Pueblo Conservancy District is a political subdivision of the State of Colorado. It does have the ability to enter into a contract with the Colorado Water Conservation Board for the purpose of obtaining a Construction Fund loan necessary for maintaining the levee.
- 2. Existing ownerships and rights-of-way are adequate for the construction of the proposed works.
- 3. The project will provide for the design and reconstruction of the Wildhorse Creek Levee and the Arkansas River Levee to the standards required by FEMA and NFIP for levee design and certification of the same.
- 4. The total requested loan is \$22M. This loan will payoff the current \$10M loan and the remaining proceeds will be used for the remaining \$12M of design and construction costs.
- 5. There are three to four remaining phases of construction. It is anticipated that the work will be completed in 2021 or 2022.
- 6. The District has a track record of income from their maintenance fund assessment and has authority to increase the assessment rate if required for project financing.
- 7. The construction work completed to date proves that the project is technically feasible.





APPENDIX B - FLOODPLAIN WITHOUT LEVEES



COLORADO

Colorado Water **Conservation Board**

Department of Natural Resources

Colorado Water Conservation Board

Water Supply Reserve Fund

APPENDIX C - BUDGET AND SCHEDULE

Date: May 31, 2017

Date. May	51, 2017					
Water Activ	vity Name: ARKANSAS RIVER LEVEE IMPROVE	EMENTS				
Borrower N	lame: PUEBLO CONSERVANCY DISTRICT					
<u>Task No.</u>	<u>Description</u>	<u>Start Date⁽¹⁾</u>	End Date	<u>Matching Funds</u> (cash & in-kind) ⁽²⁾	<u>WSRF Funds</u> (Basin & Statewide combined) ⁽²⁾	<u>Total</u>
<u>1</u>	Preparation of Phase 4 Bid documents and Construction Administration	May 2017	March 2018	\$224,900		\$224,900
2	Phase 4 Contruction	November 2017	March 2018	\$3,750,000		\$3,750,000
3	Preparation of Phase 5 Bid documents and Construction Administration	May 2018	March 2019	\$225,000		\$225,000
4	Phase 5 Contruction	November 2018	March 2019	\$3,750,000		\$3,750,000
5	Preparation of Phase 6 Bid documents and Construction Administration	May 2019	March 2020	\$225,000		\$225,000
6	Phase 6 Contruction	November 2019	March 2020	\$3,750,000		\$3,750,000
						\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0
			 Total	\$11,924,900	\$0	\$0 \$11,924,900

(1) Start Date for funding under \$100K - 45 Days from Board Approval; Start Date for funding over \$100K - 90 Days from Board Approval.

(2) Round values up to the nearest hundred dollars.

Reimbursement eligibility commences upon the grantee's receipt of a Notice to Proceed (NTP)

NTP will not be accepted as a start date. Project activities may commence as soon as the grantee enters contract and receives formal NTP if prior to the listed "Start Date"

CWCB will withhold the last 10% of the entire grant budget until the Final Report (Deliverable) is completed and accepted (2016 WSRF Criteria & Guidelines).

Additonally, the applicant shall provide a progress repost every 6 months, beginning from the date of contract execution



COLORADO

Colorado Water Conservation Board

Department of Natural Resources

Water Project Loan Program

Application Type						
Prequalification (Attach 3 years of financial statements) X Loan Approval (Attach Loan Feasibility Study)						
Agency/Company Information						
Company / Borrower Name: Pueblo Conservancy District						
Authorized Agent & Title: Paul J. Willumstad, President of Board						
Address: P.O. Box 234, Pueblo, CO 81002						
Phone: (719) 201-1155 Email:pjwill@mindspring.com						
Organization Type: pitch Co, pistrict, Municipality Incorporated? YES						
x other: statutory district X NO						
County: Pueblo	Number of Shares/Taps: N/A					
Water District: 2	Avg. Water Diverted/Yracre-feet					
Number of Shareholders/Customers Served: 160						
Federal ID Number: 84-6002506	Average monthly water bill \$ N/A (Municipality)					
Contact Information						
Project Representative: Rick Kidd, Dist	rict Administrator/ Engineer					
	kkidd@kiddengineering.com					
Engineer: Rick Kidd						
Phone: () Email:						
Attorney: Donald J. Banner						
Phone: (719) 544–5086 Email: dbar	nner@bannerbower.com					
Project Information						
Project Name: Pueblo Conservancy Dis	trict Levee Project					
Brief Description of Project: (Attach separate shee						
Repairing the Arkansas and Wildho	orse Creek levies through the City of					
Pueblo to FEMA standards for certification to a) provide flood						
protection to the city and b) ϵ	eliminate the need for flood insurance.					
General Location: (Attach Map of Area) See Appendix A to Feasibility Study						
Estimated Engineering Costs: \$1.3 million	Estimated Construction Costs					
Other Costs (Describe Above):	Estimated Construction Costs: \$ 21.7 million Estimated Total Project Costs: \$23 million					
Requested Loan Amount:	Requested Loan Term (10, 20, or 30 years):					
\$ 23 million	Years					
See Feasibility Study Project Start Date(s) Design: Construction: See Feasibility Study						
Signature						
	Return to: Finance Section Attn: Anna Mauss 1313 Sherman St #718					
() MAA DO	Denver, CO 80203					
La Willinkan fros. 5/31/	Ph. 303/866.3449 e-mail: anna.mauss@state.co.us					
Signature / Title Date						