STATE OF COLORADO

Colorado Water Conservation Board
Department of Natural Resources
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TO: Colorado Water Conservation Board Members

FROM: Anna Mauss, P.E., Project Manager
Kirk Russell, P.E., Chief
Finance Section

DATE: September 18, 2012

SUBJECT: **Agenda Item 23c, September 27-28, 2012 Board Meeting**
Finance/Water Supply Planning – WSRA Grant & Construction Fund Loan
Sanchez Ditch and Reservoir Company – Sanchez Reservoir Outlet Rehabilitation Project

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Introduction
The Sanchez Ditch and Reservoir Company (Company) is applying for a WSRA grant and CWCB loan to finance the Sanchez Reservoir Outlet Rehabilitation Project (Project). The purpose of the Project is to make safety and operational improvements to the outlet works at Sanchez Reservoir (Reservoir). The total Project cost is estimated to be $2,032,000. In July of 2012, the Company was approved for a $914,400 grant by the Rio Grande Basin Round Table from the Water Supply Reserve Account. The Company is requesting a loan from the CWCB to cover the remaining $1,117,600. See attached Project Data Sheet for a location map and a Project summary.

Staff Recommendation for WSRA Grant
Staff recommends approval of up to $859,400 from the Statewide Account and $55,000 from the Rio Grande Basin Account to fund the Sanchez Reservoir Outlet Rehabilitation Project.

Staff Recommendation for Construction Fund Loan
Staff recommends the Board approve a loan, from the Construction Fund, not to exceed $1,128,776 ($1,117,600 for project costs and $11,176 for the 1% Loan Service Fee) to the Sanchez Ditch and Reservoir Company for the Sanchez Reservoir Outlet Rehabilitation Project. The loan terms shall be 30 years at the agricultural rate of 1.75% per annum, the first 5 years of which are interest only. Security for the loan shall be in compliance with CWCB Financial Policy #5.

Staff additionally recommends a contract condition requiring the Company to make additional principal payments of $5,000 annually to CWCB Loan Contract C153623. Upon the final payment to C153623, an additional $15,000 shall be paid annually to CWCB Loan Contract C153755A.

Background
The Company provides irrigation water for users in Costilla County, southwest of the town of San Luis. The Company's primary storage reservoir is Sanchez Reservoir. The approximately 104,000 acre-foot reservoir was built in 1910 and is impounded by two separate earthfill dams known as the Main Dam and East Dike. The Main Dam is 135 feet tall and 1,170 feet long and is classified as a large, high hazard structure.

The reservoir's outlet includes a 135 foot tall concrete gate tower. Within the tower there are eight sets of 30-inch diameter valves located at varying elevations. Water exits the gate tower through a 10 ½ foot concrete outlet conduit that is approximately 600 feet long. In order to access the gates to operate the dam, a tramway/gondola runs along a cable and is powered by a portable gasoline generator. Because daily access to the tower is required during irrigation season, the reliability and safety of the gondola system has been a concern of the Company.

In July of 2011, the Company was awarded $95,000 in WSRA grants ($10,000 from the Rio Grande Basin Account and $85,000 from the Statewide Account) to assess the deteriorating infrastructure and safety concerns of the reservoir. That study, titled "Phase I Assessment & Upgrade, " concluded that abandoning the gondola and replacing the outlet works with remotely operated valves would provide for the most efficient management of the water and would improve safety for Company employees.

Loan Feasibility Study
The loan feasibility study, titled "Feasibility Study for Sanchez Reservoir Outlet Rehabilitation Plan," dated July 2012, was prepared by Duane Smith, P.E. of Smith Geotechnical. The study was prepared in accordance with CWCB guidelines and includes preliminary engineering and an engineer's estimate of probable cost that were used in determination of the total Project cost. The Loan Feasibility Study was included as a part of the "Phase I Assessment and Upgrade" report completed with the July 2011 WSRA grants.

The Sanchez Ditch and Reservoir Company
The Company is a Colorado Mutual Ditch Company, incorporated in 1955 and is in good standing with the Colorado Secretary of State. The Company serves over 13,400 acres of irrigated crop land and another 18,400 acres of farm land which, due to lack of water, are either not irrigated or are irrigated in rotation. The Company's system includes Sanchez Reservoir (103,155 AF), Stabilization Reservoir (300 AF), 38 miles of concrete lined ditch, 15 miles of earthen ditch, 23 miles of canal, and a diversion structure at the inlet of Culebra Sanchez Canal.

The Company is governed by a five-member board of directors. There are 34 shareholders with a total of 21,790 shares of stock. The board has the ability to take on debt and to withhold delivery of water to stockholders if assessment are unpaid. Liens can also be placed against any shares of stock if assessments are unpaid. Shareholder approval is required in order to set assessments for engineering services and reservoir repair projects.

Water Rights
The Company's decreed water rights are dated from 1856 and go through 1934 for a total of 373.95 cfs. Sanchez Reservoir specifically has a decreed storage right of 103,155 AF. On average the Company delivers 15,000 AF annually.

Project Description

The objective of this Project is to address the safety and operational management concerns at the reservoir by demolishing the gate tower and modifying the outlet works.

Several alternatives were considered including: 1) repairing the tower and conduit and upgrading the gates and control system; 2) repairing the tower and replacing the existing tower gates with four larger gates; 3) demolishing the tower and replacing the outlet conduit with a new intake structure; and, 4) the do-nothing alternative. Additional options were also investigated to improve the tower access by the installation of a pedestrian bridge or the installation of a ladder on the outside of the tower.

The Company chose alternative 3 to demolish the tower. This alternative includes: demolition of the gate tower; the installation of new control gates and operators; lining the existing outlet conduit with shotcrete; repairing the downstream outlet structure; and, installing a new perimeter drain and weir along the right side of the outlet structure to control seepage.

Preliminary engineering documents have been prepared and used for estimating the total project cost summary as provided in Table 1.

TABLE 1: TOTAL PROJECT COST SUMMARY

Task	Cost
Final Engineering and Construction Management	$225,000
Construction	$1,528,000
Contingency	$279,000
Total	$2,032,000

The Project schedule is as follows: final design and State Engineer's Office (SEO) approval between January 2013 and January 2014; bid the project in May of 2014; award the bid by June of 2014; start construction in September of 2014; complete construction by March of 2015.

TABLE 2: PROJECT FUNDING SUMMARY

WSRA Grant	
Rio Grande River Basin	$55,000
Statewide	$859,400
TOTAL	$914,400
CWCB Construction Fund Loan	$1,117,600
Total Project Cost	$2,032,000

CWCB will disburse funds at a rate of 55% loan to 45% grant of each invoice amount for Project related expenses, up to the approved limit of $2,032,000.

Water Supply Reserve Account Grant

At the July 2012 Rio Grande Basin Roundtable meeting the Roundtable granted approval of the Sanchez Reservoir Phase II – Outlet Rehabilitation & Gate Tower Replacement Project application request for $55,000 in Basin Funds and recommended approval of $859,400 of Statewide Funds. Letters of support for the Project were received from the Natural Resources Conservation Service, Division of Water Resources (Division 3 office), the Town of San Luis, and the Costilla Conservation District.

Source of Funds: *$859,400 Statewide Funds, $55,000 Rio Grande Basin Funds*
Matching Funds: *$1,117,600 CWCB Loan*

Threshold and Evaluation Criteria: The application articulates how the project satisfies the Threshold and Evaluation Criteria as summarized below:

Tier 1: Promoting Collaboration/Cooperation & Meeting Water Management Goals & Identified Needs: Sanchez Reservoir is managed for recreational use as a Colorado State Wildlife Area and is a popular fishing and boating destination, providing economic benefits to Costilla County. The project has the support of the county and local communities in addressing both consumptive and non-consumptive needs, including irrigation and maintenance of a fish and wildlife conservation pool of 2,500 AF. Sanchez Reservoir also provides flood protection for a number of historic communities, including San Luis. The Rio Grande Basin Roundtable has prioritized reservoir rehabilitation as an important IPP's to preserve critical storage in the basin.

Tier 2: Facilitating Water Activity Implementation: The Company currently has two existing loans with the CWCB and has indicated that an additional assessment to cover the costs of the entire Project is not economically feasible for shareholders. The Company is working with CWCB to establish a repayment structure to retire existing debt early so the financial burden to shareholders can be addressed over a number of years rather than a large assessment increase all at once.

Tier 3: The Water Activity Addresses Issues of Statewide Value and Maximizes Benefits: This Project sustains agriculture by improving the Company's ability to store and distribute water. This Project helps meet environmental needs by ensuring the continued viability of the Sanchez Reservoir. Tourism, boating and fishing bring needed funds into one of the poorest communities of Colorado. This Project also reduces the risk of flooding in the area.

Discussion:
As identified in the SWSI findings, small agricultural water users often lack the financial ability to adequately address infrastructure needs without financial aid. The Company does not possess the financial resources to make the improvements to efficiently and safely utilize its existing water rights without the loan and grant funding. In addition, the SWSI Management Objectives, of the SWSI Phase II Report: Addressing the Water Supply Gap Technical Roundtable, includes the "sustainably meet agricultural demands," which is directly met through this activity. The proposed Project effectively meets the objectives of HB 1177 and the consumptive needs of the Rio Grande Basin by rehabilitating existing infrastructure to preserve agricultural water use.

Issues/Additional Needs:
The Colorado Division of Water Resources (Division 2 office) reviewed the feasibility study and grant application and provided the following comments:

Please note we have not performed a technical review of the proposed alternatives due to their preliminary nature.

(1) *While we support the Sanchez Dam outlet rehabilitation proposed in the May 2012 feasibility report and believe it is a necessary project, we have also made the dam owner aware of our concerns with the right abutment seepage. We have advised them of the un-protected (i.e. no filter protection) nature of the seepage flow path in this area and the fact that this is a fairly serious potential failure mode that we will be tracking as reservoir levels rise. Due to this as an identified failure mode there is a potential for a State Engineer's storage restriction if seepage and piezometric levels continue to rise relative to historic levels when water becomes available to store. We don't want anyone to be surprised if after spending significant time and resources on the outlet works rehabilitation, additional work related to seepage protection is mandated by this office.*
(2) *Past borings and geologic conditions indicate a potential flaw associated with embankment soils in contact with fractured basalt at the right abutment contact. Limited monitoring data indicates increased piezometric pressure and seepage rates in the right abutment since 2004. Due to the limited historic monitoring data and the current low stage of the reservoir, we cannot say conclusively that there is an immediate problem and additional data collection would be very helpful for making that determination. We have therefore required the dam owner to improve their seepage and piezometer monitoring program. The owner agrees that accurate data is the key to assessing the urgency of the seepage problem and to possibly preventing a serious safety problem.*
(3) *We recommend that the proposed outlet rehabilitation project include, at a minimum, a new seepage collection system and measuring device(s) so that the right abutment seepage can be monitored more accurately.*
(4) *Although we don't want to push the scope of the outlet works rehabilitation beyond available funding or delay the project, we recommend that some consideration to be given to a comprehensive evaluation of the failure modes and weaknesses at this historic dam as an aid to potentially phasing project(s) for the most beneficial and timely use of those available funds, and the most efficient rehabilitation of this important structure. We understand that the owner wishes to pursue another Roundtable grant to help address the seepage problems --comprehensive planning may help to prioritize and phase work associated with multiple projects. For example, it could be beneficial to grout the right abutment at the same time if the reservoir is drained for outlet rehabilitation, in order to achieve a more successful grout curtain when there is no seepage.*

To address these concerns, the scope of work does include the installation of a 12-inch slotted drain pipe along the right side of the outlet structure to help control seepage. A weir will also be installed to measure discharge so more data can be collected to better analyze the seepage problem.

Reporting and Deliverables: All products, data and information developed as a result of this grant must be provided to CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform.

In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements provided below:

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.

CWCB Loan Program

Financial Analysis
The Company qualifies for the agricultural interest rate of 1.75% for a 30-year term. Table 3 provides a financial summary of the loan request.

TABLE 3: LOAN FINANCIAL SUMMARY

CWCB Loan Amount (55% of total Project cost)	$1,117,600
CWCB Loan Amount (including 1% Service Fee)	$1,128,776
CWCB Annual Loan Payment	$56,133
CWCB Annual Loan Obligation (including reserve account)	$61,747
Interest only payment (est. 2015 – 2020)	$19,754
Number of Shareholders	34
Number of Shares	20,790
Current Annual Assessment (per Share)	$11.50
Annual Cost of Project (per Share)	$2.57
Annual Cost of Project (per Share including reserve account requirement)	$2.83

Creditworthiness:
The Company has two existing loans with the CWCB (C153623 and C153755A). Both loans were for rehabilitation work on the Sanchez Reservoir outlet and dam. The Company received a one-year deferment on both loans in July 2011 so it could spend the otherwise obligated loan funds on the Phase I Assessment & Upgrade study.

In 2009, 2010 and 2011 assessments were set at $10.50 per share. In anticipation of the Project, assessments were increased to $11.50 per share in 2012. The cost of this Project will ultimately be an additional $2.83 per share. The Company is concerned that the additional debt service will be a burden on shareholders and asked the CWCB for assistance in scheduling the debt repayment to help balance out the debt burden. CWCB staff worked with the Company and suggested accelerating the payments on the original two loans. Upon substantial completion of the new Project, the Company will pay interest only for the first five years of repayment on the new loan. Principal and interest would be paid over the remaining 25 years. The extra payments and new payoff dates are noted in Table 3.

TABLE 4: CWCB LOAN CONTRACT SUMMARY

Loan Contract Number	Contract Dated	Contract Amount	Current Balance	Final Payment Due	Annual Payment Amount	Additional Principal Payments	New Estimated Final Payment Date
C153623	8/20/1992	$200,000	$64,431	2017	$11,485.57	$5,000	2016
C153755A	9/3/1997	$335,000	$187,644	2023	$19,900.35	$15,000*	2020
Totals		$535,000	$252,075		$31,385.92		

*Note: The additional payment on loan C153755A will begin in 2018 after C153623 is paid off.

By accelerating the repayment this way, the overall debt service per share, which is currently $1.52/share, will increase to a maximum of $2.97/share for six years and will then drop to $2.57/share for the remaining term of the new loan. Without accelerating the payments and

allowing interest only payments for the first five years, the debt service would have otherwise reached $4.48/share.

TABLE 5: FINANCIAL RATIOS

Financial Ratio	2009-2011	Future w/ Project (2020+)
Operating Ratio (operating revenues/operating expenses) weak: <100% - average: 100% - 120% - strong: >120%	108% (average) $237K/$220K	107% (average) $265K/$247K
Debt Service Coverage Ratio (total eligible revenues-operating expenses)/total debt service weak: <100% - average: 100% - 120% - strong: >120%	149% (strong) ($237K-$185K)/$35K	129% (strong) ($265K-$185K)/$62K
Cash Reserves to Current Expenses weak: <50% - average: 50% - 100% - strong: >100%	69% (average) $151K/$220K	61% (average) $151K/$247K
Annual Operating Cost per Acre-Foot (based on 15,000 AF) weak: >$20 - average: $10 - $20 - strong: <$10	$14.67 (average) $220K/15,000	$16.47 (average) $247K/15,000

Collateral: As security for the loan, the Company will pledge assessment revenues backed by a rate covenant and annual financial reporting and the undivided one hundred percent (100%) interest in and to the Sanchez Dam and Reservoir and all appurtenant structures thereto, including all lands on which these facilities are located. This is in compliance with the CWCB Financial Policy #5 (Collateral).

cc: Jerry Lorenz, President, Sanchez Ditch and Reservoir Company
Susan Schneider, AGO
Peter Johnson, AGO

Attachment: Water Project Loan Program – Project Data Sheet

CWCB Construction Loan Program
Project Data Sheet

Borrower: Sanchez Ditch and Reservoir Co**.**

County: Costilla

Project Name: Sanchez Reservoir Outlet Rehabilitation Project

Project Type: Dam Rehabilitation

Basin / District: Rio Grande / 24

Water Source(s): Ventero Creek

Total Project Cost: $2,032,000

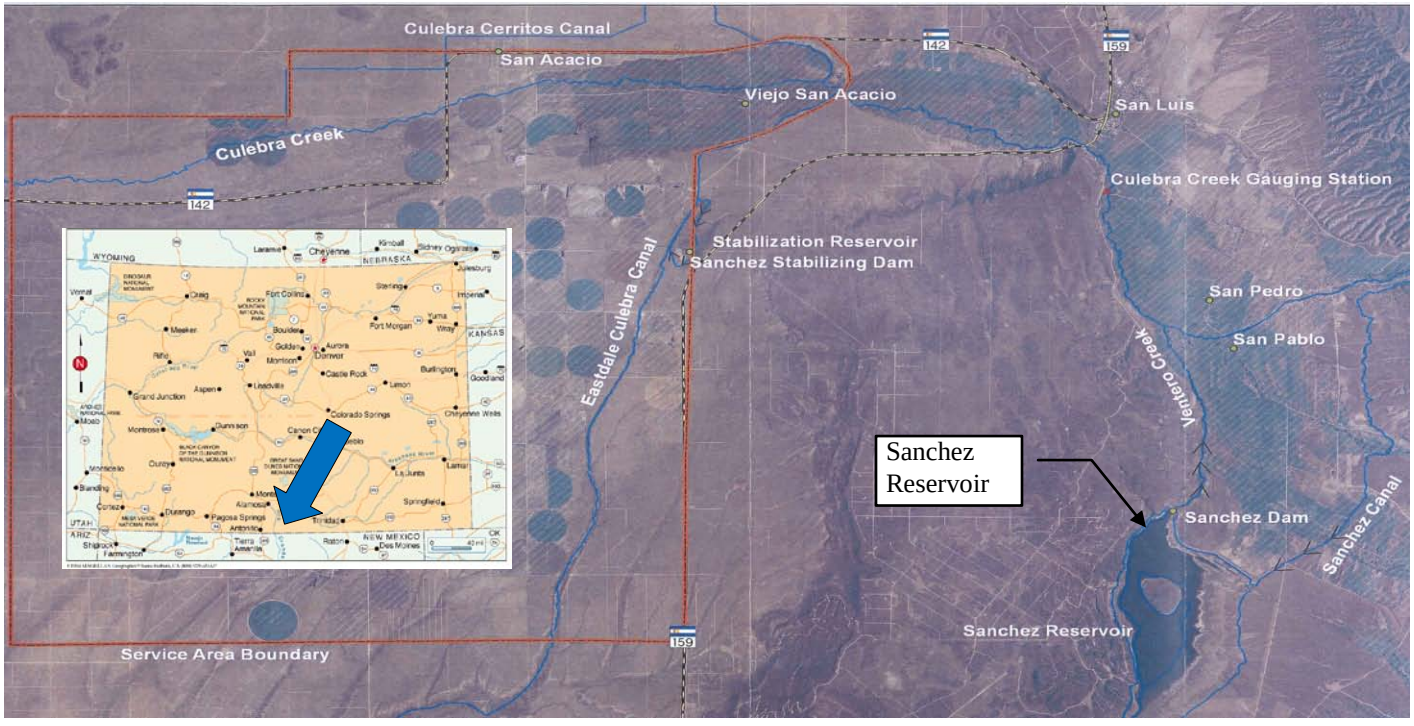
Funding Sources: Construction Fund & WSRA (Basin & Statewide funds)

Type of Borrower: Agricultural

Average Diversions: 15,000 AF

Loan Amount: $1,128,776 (Including 1% fee) **Interest Rate:** 1.75% **Term:** 30 years
WSRA Grant Amounts: $55,000 Rio Grande Basin & $859,400 Statewide

The Company provides irrigation water for users in Costilla County, southwest of the town of San Luis. The Company's primary storage reservoir is Sanchez Reservoir. The approximately 104,000 acre-foot reservoir was built in 1910. The reservoir's outlet includes a 135 foot tall concrete gate tower. In order to access the gates to operate the dam, a tramway/gondola runs along a cable and is powered by a portable gasoline generator. Because daily access to the tower is required during irrigation season, the reliability and safety of the gondola system has been a concern of the Company. Using loan and grant funds, the Company intends to address the safety and operational management concerns at the reservoir through the demolition of the gate tower; the installation of new control gates and operators; lining the existing outlet conduit with shotcrete; repairing the downstream outlet structure; and, installing a new perimeter drain and weir along the right side of the outlet structure to control seepage. The project schedule is estimated as: final design and State Engineer's Office (SEO) approval between January 2013 and January 2014; bid the project in May of 2014; award the bid by June of 2014; start construction in September of 2014; complete construction by March of 2015.



Rio Grande Inter-Basin Roundtable
c/o San Luis Valley Water Conservancy District
623 Fourth Street
Alamosa, CO 81101
Telephone: (719) 589 – 2230
Email: slvwcdco1@qwestoffice.net

July 12, 2012

Mr. Michael King, Executive Director
Colorado Department of Natural Resources

Mr. Todd Doherty, Intrastate Water Management & Development
Colorado Water Conservation Board

Reference: SANCHEZ RESERVOIR PHASE II - OUTLET REHABILIATION & GATE TOWER REPLACMENT

Gentlemen:

The Rio Grande Inter-Basin Roundtable (R.G.R.T) has determined that the single, most critical water issue confronting the Rio Grande Basin (Basin) is the current unsustainable management of surface and ground water. The R.G.R.T. has made the decision that water activities that address this issue be favorably considered for funding from the Water Supply Reserve Account, SB 2005 -179 (WSRA Funds), providing the proposed water activities meet the SWSI findings for the Basin and the CWCB & IBCC Criteria and Guidelines for funding.

The **Sanchez Reservoir Phase II – Outlet Rehabilitation & Gate Tower Replacement** (Project) will provide the long term ability for the Sanchez Ditch & Reservoir Company to effectively provide water storage and irrigation of 22,400 acres in the south eastern part of the San Luis Valley, in the Costilla County, Colorado.

The applicant for the subject WSRA funds is the Sanchez Ditch and Reservoir Company (SDRC) which is a Colorado Mutual Ditch Company, incorporated in 1956. The company's facilities, built between 1910 and 1915, are in Costilla County, south and west of the town of San Luis. They consist of Sanchez Reservoir (capacity 104,000 acre feet), Stabilization Reservoir (capacity 300 acre feet), approximately 38 miles of concrete lined ditch, approximately 15 miles of earthen ditch, approximately 23 miles of canal, and a diversion at the inlet of Culebra Sanchez Canal.

The SDRC administers an irrigation system with approximately 227 contracts to supply water, serving an area of 22,414 acres which are capable of being irrigated in Costilla County, Colorado. The service area includes 13,424 acres of irrigated crop land and

18,392 acres of farm land which, due to lack of water, are either not irrigated or irrigated in rotation. Sanchez Reservoir serves 34 corporate and individual shareholders with a total of 21,802.716 shares. Irrigated crops include potatoes, wheat, barley, oats, alfalfa, and hay mixtures.

The Sanchez Reservoir is impounded by two separate earth fill dams: a Main Dam and an East Dike, with a total of 104,000 acre feet of water. The Main Dam, 135 feet in height and 1170 feet in length, is constructed across the channel of Ventero Creek, and contains the reservoir outlet works. This dam is classified as a Large, High Hazard structure. Both dams were constructed during the period of 1910-1911.

The outlet structure is a 150-foot high, free-standing concrete Gate Tower in the reservoir at the upstream end of the outlet conduit. An octagonal room at the top of the tower houses the gate controls. With construction completed in 1915, this Gate Tower controls discharges utilizing a combination of gates and valves located at various elevations.

The present outlet system consists of an inverted U-shaped cast-in-place concrete conduit, 8 feet wide, 10.5 feet high, and 576.6 feet long, through the base of the dam at its maximum section. At the downstream end of the conduit, flow is discharged through a concrete flume structure to Ventero Creek.

For more than 100 years, access to the top of the Gate Tower for operation and maintenance has required the use of a tramway and Gondola. The Gondola runs on a system of cables and is powered by a portable gasoline engine to winch the Gondola from the shore to the Tower.

The SDRC previously obtained WRSA funds to partially fund a Phase I Assessment and Upgrade analysis. This Phase I project included improving the safety and structural integrity of the Gondola/Tramway system; repaired a 30" intake control gate to increase reservoir discharge capacity; upgraded the hydraulic gate control system; and automated essential reservoir operations. The Gondola ride has been bypassed by a web-based SCADA system, enabling SDRC to efficiently manage its water from its office in San Acacio, about 10 miles away.

The Phase 1 project included a feasibility study by Smith Geotechnical Engineering, Inc. (SGE), to evaluate the long term viability of the control tower and outlet conduit and to develop potential alternatives to the current configuration of gates and operators in the Gate Control Tower. After assessing the alternatives developed by SGE in Phase I, SDRC has determined that the best alternative is to upgrade the outlet structure, to demolish a portion of the gate tower and to modify the remaining bottom portion of the tower to create a more conventional outlet.

At the regular Meeting of the Rio Grande Inter-Basin Roundtable on June 12, 2012 the Members unanimously recommended that this Project be funded as described below:

PROJECT AND AMOUNT REQUESTED	SOURCE SB 179
Sanchez Reservoir Phase II - BASIN FUNDS	$55,000
- STATE FUNDS	$859,400
TOTAL	$914,400

The Construction Project Costs of $2,032,000 plus a loan service fee of $11,176 equals Gross Total Cost of $2,043,176. SDRC is providing a 55% match of Construction Project Costs by securing a loan from CWCB for $1,117,600, plus the 1% service fee, for a total loan of $1,128,776. The remaining 45% of Total Project Costs or $914,400 is requested in this proposal from WSRA funds, with $859,400 from the Statewide Account and $55,000 from the Rio Grande Basin's WSRA Account. The SDRC is also providing $50,000 in in-kind Administrative oversight for the project.

Project Description:

The gate tower will be demolished above a predetermined elevation. The tower will be removed by sawing a notch on the reservoir side and setting explosive charges to topple the structure into the reservoir. The remaining stub of the tower will then be saw-cut at a pre-determined elevation to provide a uniform joint. A slab will then be placed over the top of the remaining portion of the tower to allow the installation of thimbles in the concrete slab for the installation of the two sloped gates. One will be a 5' x 6' gate and the other, used for normal operation, will be a 30" x 30" gate, for a total capacity of approximately 1,500 cfs. The two new slide gates will be operated by hydraulic cylinders located on the slab. An 18"x24" concrete grade beam from the gates to the dam crest will be constructed on the face of the dam to support the hydraulic lines and a gate vent pipe.

A precast concrete control house will be installed on the upstream face of the dam above the high water level to contain the operators and the controls for remote automated gate operation.

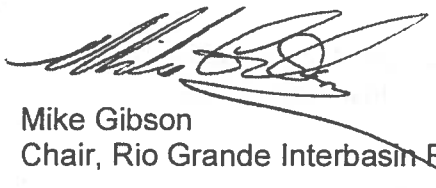
The right side of the outlet structure is in disrepair and portions of the concrete walls have failed. The outlet conduit will be rehabilitated, removing and replacing the deteriorated portions of the downstream outlet works. Measures may be included to collect and filter the seepage that exits into this structure. Rehabilitating the outlet conduit will increase the long term stability of the dam.

The Project provides the long term benefits to the local area and State:

- It enables SDRC to continue providing irrigation water to its shareholders for decades into the future. It improves water management efficiencies, protecting water rights for irrigation from high runoff from Culebra Creek, Ventero Creek, San Francisco Creek, Vallejos Creek, and Torcido Creek.
- It greatly reduces risk of injury or possible loss of life by replacing the 100 year old Gate Tower and eliminating dependence on the Gondola. Dam stability and longevity are improved by this project.
- Upgrading the outlet structure ensures structural integrity of the dam and promotes long term operational efficiencies, thereby helping to promote proper function of the Culebra floodplain.
- SDRC has a contract with the CDPR granting a perpetual easement for recreation and preserving a 2,500 AF conservation pool, providing fishing and boating opportunities at Sanchez Reservoir.
- Sanchez Reservoir is managed as a Colorado State Wildlife Area.
- Sanchez Reservoir supports tourism, attracting visitors from all over Colorado and northern New Mexico. Ice fishing is particularly popular in winter, when very little other economic activity is possible in this economically stressed and mostly agrarian community.
- This reservoir serves a historically important part of Colorado, where the state's first water right was adjudicated. Irrigation in many parts of this region relies on the traditional *acequia* system, a communal and culturally significant method of ditch maintenance involving the participation of many families.
- By eliminating wasteful and deteriorating structures and antiquated machinery, this project promotes appreciation for the spectacular beauty of Sanchez Reservoir with its wide horizons and views of the Sangre de Cristo range of the Rockies.

The R.G.R.T. appreciates the support of the Department of Natural Resources, the Colorado Water Conservation Board and the Interbasin Compact Commission in assisting in meeting the needs of all users of Colorado's water and in fostering intrabasin and interbasin communications and discussions. We believe that the above project will assist in this effort.

Sincerely,



Mike Gibson
Chair, Rio Grande Interbasin Roundtable

Enclosures (2)

cc: Sanchez Ditch and Reservoir Company

COLORADO
DEPARTMENT OF NATURAL RESOURCES

COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT APPLICATION FORM

SANCHEZ RESERVOIR PHASE II - OUTLET REHABILITATION AND GATE TOWER REPLACEMENT

Name of Water Activity/Project

THE SANCHEZ DITCH AND RESERVOIR COMPANY

Name of Applicant

RIO GRANDE BASIN

Approving Basin Roundtable(s)
(If multiple basins specify amounts in parentheses.)

Amount from Statewide Account: $859,400.00

Amount from Basin Account(s): $ 55,000.00

Total WSRA Funds Requested: $914,400

Application Content

Required Exhibits

Appendices – Reference Material

1. Program Information
2. Insurance Requirements
3. WSRA Standard Contract Information (Required for Projects Over $100,000)
4. W-9 Form (Required for All Projects Prior to Contracting)

Instructions

To receive funding from the Water Supply Reserve Account (WSRA), a proposed water activity must be approved by the local Basin Roundtable **AND** the Colorado Water Conservation Board (CWCB). The process for Basin Roundtable consideration and approval is outlined in materials in Appendix 1.

Once approved by the local Basin Roundtable, the applicant should submit this application **with a detailed statement of work including budget and schedule as Exhibit A** to CWCB staff by the application deadline.

WSRA applications are due with the roundtable letter of support 60 calendar days prior to the bi-monthly Board meeting at which it will be considered. Board meetings are held in January, March, May, July, September, and November. Meeting details, including scheduled dates, agendas, etc. are posted on the CWCB website at: http://cwcb.state.co.us Applications to the WSRA Basin Account are considered at every board meeting, while applications to the WSRA Statewide Account are only considered at the March and September board meetings.

When completing this application, the applicant should refer to the WSRA Criteria and Guidelines available at: http://cwcb.state.co.us/LoansGrants/water-supply-reserve-account-grants/Documents/WSRACriteriaGuidelines.pdf

The application, statement of work, budget, and schedule **must be submitted in electronic format** (Microsoft Word or text-enabled PDF are preferred) and can be emailed or mailed on a disk to:

Greg Johnson – WSRA Application
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, CO 80203
gregory.johnson@state.co.us

If you have questions or need additional assistance, please contact Greg Johnson at: 303-866-3441 x3249 or gregory.johnson@state.co.us.

Water Supply Reserve Account – Application Form
Revised December 2011

Part I. - Description of the Applicant (Project Sponsor or Owner);

1.	Applicant Name(s):	The Sanchez Ditch and Reservoir Company		
	Mailing address:	Route 1 Box 215 San Acacio, CO 81550		
	Taxpayer ID#:	84-0465682		
	Primary Contact:	Travis Robinson	Position/Title:	Manager
	Email:	sanchezditch@gojade.org		
	Phone Numbers:	Cell: 719-588-6385	Office:	719-672-3963
	Alternate Contact:	Jerry Lorenz	Position/Title:	President
	Email:	sanchezditch@gojade.org		
	Phone Numbers:	Cell:	Office:	719-672-3963

2. Eligible entities for WSRA funds include the following. What type of entity is the Applicant?

[ ] Public (Government) – municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities and the local entity should be the grant recipient. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.

[ ] Public (Districts) – authorities, Title 32/special districts, (conservancy, conservation, and irrigation districts), and water activity enterprises.

[x] Private Incorporated – mutual ditch companies, homeowners associations, corporations.

[ ] Private individuals, partnerships, and sole proprietors are eligible for funding from the Basin Accounts but not for funding from the Statewide Account.

[ ] Non-governmental organizations – broadly defined as any organization that is not part of the government.

3. Provide a brief description of your organization

Nonprofit Incorporation: The Sanchez Ditch and Reservoir Company (SDRC) is a Colorado Mutual Ditch Company, incorporated in 1956. The company's facilities, built between 1910 and 1915, are in Costilla County, south and west of the town of San Luis. They consist of Sanchez Reservoir (capacity 104,000 acre feet), Stabilization Reservoir (capacity 300 acre feet), approximately 38 miles of concrete lined ditch, approximately 15 miles of earthen ditch, approximately 23 miles of canal, and a diversion at the inlet of Culebra Sanchez Canal.

Service Area: SDRC administers an irrigation system with approximately 227 contracts to supply water, serving an area of 22,414 acres which are capable of being irrigated in Costilla County, Colorado. The service area includes 13,424 acres of irrigated crop land and 18,392 acres of farm land which, due to lack of water, are either not irrigated or irrigated in rotation. Sanchez Reservoir serves 34 corporate and individual shareholders with a total of 21,802.716 shares. Irrigated crops include potatoes, wheat, barley, oats, alfalfa, and hay mixtures. (Appendix B)

Reservoir Structure: The reservoir is impounded by two separate earthfill dams: a Main Dam and an East Dike, with a total of 104,000 acre feet of water. The Main Dam, 135 feet in height and 1170 feet in length, is constructed across the channel of Ventero Creek, and contains the reservoir outlet works. This dam is classified as a Large, High Hazard structure. Both dams were constructed during the period of 1910-1911.

Intake Structure and Controls: As described and shown in Appendix C, the intake structure is a 150-foot high, free-standing concrete Gate Tower in the reservoir at the upstream end of the outlet conduit. An octagonal room at the top of the tower houses the gate controls. With construction completed in 1915, this Gate Tower controls discharges utilizing a combination of gates and valves located at various elevations.

Outlet & Discharge Structures: The present outlet system consists of an inverted U-shaped cast-in-place concrete conduit, 8 feet wide, 10.5 feet high, and 576.6 feet long, through the base of the dam at its maximum section. At the downstream end of the conduit, flow is discharged through a concrete flume structure to Ventero Creek.

A Century of Operation: For more than 100 years, access to the top of the Gate Tower for operation and maintenance has required the use of a tramway and Gondola. As shown in Appendix C, the Gondola runs on a system of cables and is powered by a portable gasoline engine to winch the Gondola from the shore to the Tower.

Phase I Assessment and Upgrade: Until today, with the June 2012 completion of *Phase I Assessment and Upgrade,* access to the Gate Tower by Gondola has been an integral part of the operation of the reservoir, requiring manual control of all operations from the control room at the top of the Tower. Thanks to WSRA funding, SDRC has improved the safety and structural integrity of the Gondola/Tramway system; repaired a 30" intake control gate to increase reservoir discharge capacity; upgraded the hydraulic gate control system; and automated essential reservoir operations. Today the Gondola ride has been bypassed by a web-based SCADA system, enabling SDRC to efficiently manage its water from the comfort of its office in San Acacio, about 10 miles away.

Feasibility of Outlet Configuration: The *Phase I Assessment and Upgrade* included a feasibility study by Smith Geotechnical Engineering, Inc. (SGE), the purpose being to evaluate the long term viability of the control tower and outlet conduit and to develop potential alternatives to the current configuration of gates and operators in the Gate Control Tower. Of three possible alternatives, SDRC has determined to upgrade the outlet conduit and to demolish and replace the Gate Tower with a more effective system.

If the Contracting Entity is different then the Applicant (Project Sponsor or Owner) please describe the Contracting Entity here.

They are the same.

4. Successful applicants will have to execute a contract with the CWCB prior to beginning work on the portion of the project funded by the WSRA grant. In order to expedite the contracting process the CWCB has established a standard contract with provisions the applicant must adhere to. A link to this standard contract is included in Appendix 3. Please review this contract and check the appropriate box.

[X] The Applicant will be able to contract with the CWCB using the Standard Contract

[ ] The Applicant has reviewed the standard contract and has some questions/issues/concerns. Please be aware that any deviation from the standard contract could result in a significant delay between grant approval and the funds being available.

5. The Tax Payer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect the applicant.

NA

Part II. - Description of the Water Activity/Project

1. What is the primary purpose of this grant application? (Please check only one)

	Nonconsumptive (Environmental or Recreational)
X	Agricultural
	Municipal/Industrial
	Needs Assessment
	Education
	Other Explain:

2. If you feel this project addresses multiple purposes please explain.

For a full explanation of each of the following multiple purposes addressed by this project, see Section III-2-a, as we have chosen to detail them under "Tier 1" evaluation criteria, which asks, essentially, the same question.

This project fulfills many purposes, including the following:

- **Irrigation:** It enables SDRC to continue providing irrigation water to its shareholders for decades into the future. It improves water management efficiencies, protecting water rights for irrigation from high runoff from Culebra Creek, Ventero Creek, San Francisco Creek, Vallejos Creek, and Torcido Creek.
- **Safety:** It greatly reduces risk of injury or possible loss of life by replacing the 100 year old Gate Tower and eliminating dependence on the Gondola. Dam stability and longevity are improved by this project.
- **Flood protection:** Upgrading the outlet structure ensures structural integrity of the dam and promotes long term operational efficiencies, thereby helping to promote proper function of the Culebra floodplain.
- **Recreation:** SDRC has a contract with the CDPR granting a perpetual easement for recreation and preserving a 2,500 AF conservation pool, providing fishing and boating opportunities at Sanchez Reservoir.
- **Wildlife:** Sanchez Reservoir is managed as a Colorado State Wildlife Area.
- **Economy:** Sanchez Reservoir supports tourism, attracting visitors from all over Colorado and northern New Mexico. Ice fishing is particularly popular in winter, when very little other economic activity is possible in this economically stressed and mostly agrarian community.
- **Protecting cultural values:** This reservoir serves a historically important part of Colorado, where the state's first water right was adjudicated. Irrigation in many parts of this region relies on the traditional *acequia* system, a communal and culturally significant method of ditch maintenance involving the participation of many families.

- **Promoting aesthetic values:** By eliminating wasteful and deteriorating structures and antiquated machinery, this project promotes appreciation for the spectacular beauty of Sanchez Reservoir with its wide horizons and views of the Sangre de Cristo range of the Rockies.

3. Is this project primarily a study or implementation of a water activity/project? (Please check only one)

	Study	X	Implementation

4. To catalog measurable results achieved with WSRA funds can you provide any of the following numbers?

	New Storage Created (acre-feet)
	New Annual Water Supplies Developed, Consumptive or Nonconsumptive (acre-feet)
104,000 AF	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
576.5 ft	Length of Pipe/Canal Built or Improved (linear feet)
Save lives	Efficiency Savings (acre-feet/year OR dollars/year – **circle one**)
	Area of Restored or Preserved Habitat (acres)
1797 AF	Other -- Explain: Perpetual recreational easement & conservation pool

4. To help us map WSRA projects please include a map (Exhibit B) and provide the general coordinates below:

Latitude: 37-06'48" N Longitude: 105-24'38" W

5. Please provide an overview/summary of the proposed water activity (no more than one page). Include a description of the overall water activity and specifically what the WSRA funding will be used for. A full **Statement of Work** with a detailed budget and schedule is required as **Exhibit A** of this application.

(next page please)

Objective: This water activity enables SDRC to continue providing irrigation water to its shareholders, thereby meeting today's agricultural needs. It also improves safety, helps to preserve proper function of the flood plain, and enables the effective management of water for future generations. WSRA funding will be used to pay for 45% of all of the following, with the remainder of funds secured by a CWCB loan of $1,128,776 ($1,117,600 for the project + $11,176 for the loan service fee).

Background – Completion of Phase 1: Due to continuing deterioration of the Gate Tower and the outlet conduit, and in anticipation of ongoing maintenance issues and changing system needs, SDRC has completed the *Phase I Assessment and Upgrade.* This preliminary work addressed SDRC's concerns for safety and structural integrity relating to the Gondola, providing several more years of continued safe access to the Tower, as needed for maintenance. One of the lower 30 inch intake control gates was repaired, increasing reservoir discharge capacity. The gate control system was upgraded to hydraulic operation, and remote control is now in place, providing a digital means of managing essential reservoir operations.

Selecting Alternative No. 3: After assessing the alternatives developed by SGE in the *Phase I* feasibility study, SDRC has determined that the best alternative is to upgrade the outlet structure, to demolish the gate tower, and to modify the remaining bottom portion of the tower to create a more conventional outlet.

Demolishing and Replacing the Gate Tower: The gate tower will be demolished above approximately elevation 8335 feet. The tower will be removed by sawing a notch on the reservoir side and setting explosive charges to topple the structure into the reservoir. The remaining stub of the tower will then be saw cut at a pre-determined elevation to provide a uniform joint. A slab will then be placed over the top of the remaining portion of the tower to allow the installation of two new slide gates which will be operated by hydraulic cylinders located on the slab. An 18"x24" concrete grade beam from the gates to the crest will be constructed on the face of the dam to support the hydraulic lines and a gate vent pipe.

Dewatering and Silt Removal: To facilitate tower demolition and installation of the concrete cap slab on the remaining stub of the tower, a sheetpile cofferdam will be installed to elevation 8340 feet, allowing for dewatering and removal of the silt from around the tower.

New Gates: The tower walls will be saw cut to a uniform elevation and thimbles will be installed in the concrete slab for the installation of the two sloped gates. One will be a 5' x 6' gate and the other, used for normal operation, will be a 30" x 30" gate, for a total capacity of approximately 1500 cfs at maximum pool of 4825 feet.

Control House: A precast concrete control house will be installed on the upstream face of the dam above the high water level to contain the operators and the controls for remote automated gate operation.

Outlet Conduit: The right side of this structure is in disrepair and portions of the concrete walls have failed. The outlet conduit will be rehabilitated, removing and replacing the deteriorated portions of the downstream outlet works. Measures may be included to collect and filter the seepage that exits into this structure. Rehabilitating the outlet conduit will increase the long term stability of the dam.

Challenges: Implementing this alternative will be a significant undertaking. SGE anticipates that the water needs to be drawn down to about 8340 feet to be practical for the installation. Access to the tower for a crane or an excavator with a pile driver attached can be accomplished with a barge or by the placement of fill to construct a road along the dam face to a point near the tower. The lower the water can be drawn down, the closer the road and crane can be to the work area, reducing the size of the crane required to do the job.

Part III. – Threshold and Evaluation Criteria

1. Describe how the water activity meets these **Threshold Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines.)

   a) The water activity is consistent with Section 37-75-102 Colorado Revised Statutes.[1]

   Protecting water rights: By improving the operational and maintenance efficiency of Sanchez Reservoir, as proposed in this application, this project protects from flooding and improves the ability of Sanchez Ditch and Reservoir Company to store and release water for irrigation, for recreation, for wildlife, and for flood control, thus protecting existing water rights in the boundary of SDRC's jurisdiction as well as in the surrounding area. Furthermore…

   Not affecting water rights: This project does not affect, supersede, abrogate, or otherwise impair the current system of allocating water within Colorado. Nothing in this project has any effect upon, nor does it repeal or in any manner amend the existing water rights adjudication system. Nor does it affect the state constitution's recognition of water rights as a private usufructuary property right. Nothing in this project is intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law.

   Not affecting other rights: This project does not affect the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. When implemented, this project will not diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This project does not supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights, nor does it impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

[1] 37-75-102. Water rights - protections. (1) It is the policy of the General Assembly that the current system of allocating water within Colorado shall not be superseded, abrogated, or otherwise impaired by this article. Nothing in this article shall be interpreted to repeal or in any manner amend the existing water rights adjudication system. The General Assembly affirms the state constitution's recognition of water rights as a private usufructuary property right, and this article is not intended to restrict the ability of the holder of a water right to use or to dispose of that water right in any manner permitted under Colorado law. (2) The General Assembly affirms the protections for contractual and property rights recognized by the contract and takings protections under the state constitution and related statutes. This article shall not be implemented in any way that would diminish, impair, or cause injury to any property or contractual right created by intergovernmental agreements, contracts, stipulations among parties to water cases, terms and conditions in water decrees, or any other similar document related to the allocation or use of water. This article shall not be construed to supersede, abrogate, or cause injury to vested water rights or decreed conditional water rights. The General Assembly affirms that this article does not impair, limit, or otherwise affect the rights of persons or entities to enter into agreements, contracts, or memoranda of understanding with other persons or entities relating to the appropriation, movement, or use of water under other provisions of law.

b) The water activity underwent an evaluation and approval process and was approved by the Basin Roundtable (BRT) and the application includes a description of the results of the BRTs evaluation and approval of the activity. At a minimum, the description must include the level of agreement reached by the roundtable, including any minority opinion(s) if there was not general agreement for the activity. The description must also include reasons why general agreement was not reached (if it was not), including who opposed the activity and why they opposed it. Note- If this information is included in the letter from the roundtable chair simply reference that letter.

- This information is included in the accompanying letter from the Chairman of the Rio Grande Basin Roundtable.

c) The water activity meets the provisions of Section 37-75-104(2), Colorado Revised Statutes.[2] The Basin Roundtable Chairs shall include in their approval letters for particular WSRA grant applications a description of how the water activity will assist in meeting the water supply needs identified in the basin roundtable's consumptive and/or non-consumptive needs assessments.

- This information is included in the accompanying letter from the Chairman of the Rio Grande Basin Roundtable.

d) Matching Requirement: For requests from the **Statewide Fund**, the applicant is required to demonstrate a **20 percent** (or greater) match of the request from the Statewide Account. Statewide requests must also include a minimum match of **5 percent** of the total grant amount from Basin Funds. Sources of matching funds include but are not limited to Basin Funds, in-kind services, funding from other sources, and/or direct cash match. Past expenditures directly related to the project may be considered as matching funds if the expenditures occurred within 9 months of the date the application was submitted to the CWCB. Please describe the source(s) of matching funds. (NOTE: These matching funds should also be reflected in your Detailed Budget in **Exhibit A** of this application)

- Construction Project Costs of $2,032,000 plus a loan service fee of $11,176 equals Gross Total Cost of $2,043,176. SDRC is providing a 55% match of Construction Project Costs by securing a loan from CWCB for $1,117,600 plus the 1% service fee for a total loan of $1,128,776. The remaining 45% of Total Project Costs, or $914,400 is requested in this proposal from WSRA funds, with $859,400 from the Statewide Account and $55,000 from the Rio Grande Basin's WSRA Account. Applicant is also providing $50,000 in in-kind Administrative oversight for the project.

[2] 37-75-104 (2)(c). Using data and information from the Statewide Water Supply Initiative and other appropriate sources and in cooperation with the on-going Statewide Water Supply Initiative, develop a basin-wide consumptive and nonconsumptive water supply needs assessment, conduct an analysis of available unappropriated waters within the basin, and propose projects or methods, both structural and nonstructural, for meeting those needs and utilizing those unappropriated waters where appropriate. Basin Roundtables shall actively seek the input and advice of affected local governments, water providers, and other interested stakeholders and persons in establishing its needs assessment, and shall propose projects or methods for meeting those needs. Recommendations from this assessment shall be forwarded to the Interbasin Compact Committee and other basin roundtables for analysis and consideration after the General Assembly has approved the Interbasin Compact Charter.

2. For Applications that include a request for funds from the **Statewide Account**, describe how the water activity/project meets all applicable **Evaluation Criteria.** (Detailed in Part 3 of the Water Supply Reserve Account Criteria and Guidelines and repeated below.) Projects will be assessed on how well they meet the Evaluation Criteria. **Please attach additional pages as necessary.**

Evaluation Criteria – the following criteria will be utilized to further evaluate the merits of the water activity proposed for funding from the Statewide Account. In evaluation of proposed water activities, preference will be given to projects that meet one or more criteria from each of the three "tiers" or categories. Each "tier" is grouped in level of importance. For instance, projects that meet Tier 1 criteria will outweigh projects that only meet Tier 3 criteria. WSRA grant requests for projects that may qualify for loans through the CWCB loan program will receive preference in the Statewide Evaluation Criteria if the grant request is part of a CWCB loan/WSRA grant package. For these CWCB loan/WSRA grant packages, the applicant must have a CWCB loan/WSRA grant ratio of 1:1 or higher. Preference will be given to those with a higher loan/grant ratio.

Tier 1: Promoting Collaboration/Cooperation and Meeting Water Management Goals and Identified Water Needs

a. The water activity addresses multiple needs or issues, including consumptive and/or non-consumptive needs, or the needs and issues of multiple interests or multiple basins. This can be demonstrated by obtaining letters of support from other basin roundtables (in addition to an approval letter from the sponsoring basin).

Irrigation: SDCR is primarily an irrigation company. By replacing deteriorating structures and by restoring and upgrading the outlet structure, SDRC improves long term dam stability, thus ensuring its ability to continue providing storage of high runoff from Culebra Creek, Ventero Creek, San Francisco Creek, Vallejos Creek, and Torcido Creek in Sanchez Reservoir. This project supports consumptive needs of primary irrigation water rights .

Safety: SDRC has implemented the recommendations in a study by Tramway Engineering, Ltd to determine the current, short-term, and future functionality the Gondola-Tramway system. Those recommendations, combined with the feasibility study by SGE, placed a major focus on establishing long term safe access to the gates and operators of the reservoir. Also, rehabilitation of portions of the conduit was deemed necessary by SGE to maintain long term structural integrity of Sanchez Dam.

Flood protection: In all of these communities, maintaining a functioning flood plain is becoming increasingly important as aging structures continue to deteriorate throughout the Culebra watershed. Ditches and *acequias,* many of them created in the mid to late 1800s, are beginning to fail, causing flooding to residents in some of these earliest settlements in Colorado. The Town of San Luis, the oldest town in Colorado, has endured numerous floods in recent years. Upgrading reservoir infrastructure helps reduce the risk of flood from Ventero Creek, where "The Peoples Ditch," the oldest adjudicated water right in Colorado, runs through the Vega – the last remaining true "commons" pasture land in the U.S. - and through portions of the town of San Luis.

Recreation: SDRC has a contract with Colorado Department of Parks and Wildlife granting a perpetual easement for recreation and preserving a conservation pool. With almost no public recreation areas in Costilla County, this project preserves and enhances fishing and boating opportunities at Sanchez Reservoir, a destination for visitors from throughout southern Colorado and northern New Mexico. Colorado Division of Parks and Wildlife (CDPW) recently upgraded a public boat ramp and that agency lists Sanchez Reservoir as a featured ice fishing destination.

Wildlife: With 4,571 surface acres, the reservoir is managed as a Colorado State Wildlife Area, offering angling opportunities for brown trout, northern pike, walleye, yellow perch and channel catfish. Sanchez Reservoir assists CDOW to reach its water use goals and storage objectives by maintaining a fish and wildlife conservation pool of 2,500 acre feet.

Economy: This project provides a direct economic benefit to Costilla County, one of the poorest counties in the State, upgrading an asset that is important to tourists and that welcomes winter guests who come in winter, when ice fishing is popular.

Protecting cultural values and aesthetics: This project is located in a spectacular and historic part of southern Colorado where traditional *acequia* irrigation methods are still practiced. Keeping the Reservoir safe, accessible, and beautiful for another century is an objective of high value.

b. The number and types of entities represented in the application and the degree to which the activity will promote cooperation and collaboration among traditional consumptive water interests and/or non-consumptive interests, and if applicable, the degree to which the water activity is effective in addressing intrabasin or interbasin needs or issues.

SDRC has consulted with and obtained advice and historical data and records from the Division of Natural Resources (Division 3 Engineer Craig Cotten, Assistant Division 3 Engineer Pat McDermott, and dam safety engineer Mark Perry).

The San Luis office of Natural Resources Conservation Service actively supports this project (letter from Tracy Miller, District Conservationist). And the Costilla Conservation District also provides support for this Project (letter from Harold Anderson, President).

Sanchez Reservoir has worked with the Town of San Luis and Costilla County on numerous occasions. Communities which would be most seriously affected in the unlikely event of dam failure are San Pablo, San Luis and Old San Acacio. Such an event would cause severe damage and possible loss of life. San Luis, the oldest town in Colorado, with The People's Ditch crossing La Vega, the last remaining grazing commons in the U.S., has been struggling with municipal drainage problems for many years due in part to a high water table, inadequate drainage systems, and a lack of sufficient ground flow. In many instances when Culebra Creek was at flood stage, or when Ventero, Vallejos, San Francisco were at flood stage, SDRC helped direct water away from San Luis and its surrounding historic communities.

For the valuable contribution which Sanchez Reservoir makes for recreation and wildlife habitat, CDPW's Rick Basagoitia has provided a letter of support.

c. The water activity helps implement projects and processes identified as helping meet Colorado's future water needs, and/or addresses the gap areas between available water supply and future need as identified in SWSI or a roundtable's basin-wide water needs assessment.

The Rio Grande Basin Roundtable has identified the deteriorating condition of its reservoirs as a major concern, and has categorized the upgrading of these facilities as critically important. This project, by increasing the functional and operational efficiency of a large reservoir in a distinctly agricultural region of the San Luis Valley, responds to the Basin's future water needs by helping to keep water in the Basin. It improves irrigation efficiency, reduces water loss, and improves long term delivery of water.

Although SDRC is not in a groundwater management subdistrict at this time, the formation of subdistricts in the Basin is creating a critical need for more storage for augmentation, yet there are few options available. Sanchez Reservoir is primarily a storage resource, equalizing distribution in times of increasingly unpredictable climate.

Tier 2: Facilitating Water Activity Implementation

d. Funding from this Account will reduce the uncertainty that the water activity will be implemented. For this criterion the applicant should discuss how receiving funding from the Account will make a significant difference in the implementation of the water activity (i.e., how will receiving funding enable the water activity to move forward or the inability obtaining funding elsewhere).

SDRC cannot contemplate a project of this size and complexity without securing serious financing. The company has been working with Anna Mauss, of CWCB's Water Project Loan Program, and with CWCB's Kirk Russell, and together they have determined that the most appropriate course is to combine a request for WSRA funds with a carefully designed loan package. The grant-to-loan ratio of 45% to 55% has been proposed and has been reviewed by SDRC's Board of Directors, determining this mix as the best means to finance this project.

SDRC is also working with Duane Smith, of Smith Geotechnical Engineering, to develop cash flow and annual financial projections reflecting annual expenses, including the proposed loan repayment and servicing costs. The SDRC has two previous CWCB loans with remaining balances of $71,558.47 and $194,458.88. The yearly payment to the CWCB is $31,385.92 with the first loan to be retired in 2017 and the second loan in 2022. Neither of these loans is delinquent and the company has no other outstanding obligations.

SDRC hired Nicole V. Langley, of Transforma Research & Design, to help the company coordinate the planning, administration, and funding of this project. In a joint meeting of the Rio Grande Basin's "Technical Support Subcommittee" together with Kirk Russell, Anna Mauss, and Duane Smith of SGE, the strategy and details of this proposal's Scope of Work, Budget, and Timeline were worked out and integrated with CWCB's proposed accompanying loan package.

An attractive CWCB proposal suggests a preliminary period in which the company will accelerate payment of its two existing loans while at the same time requiring interest-only payments on the new loan. This plan is outlined on the following page and is being developed as this proposal is being written.

Without this WSRA grant to leverage and support the CWCB loan, this project would not be possible.

The financial condition of the company is solid. The company has no other obligations than those listed in the financial statement submitted with its loan application. Following is a summary of the company's income and expenses based on its financial statements from 2009, 2010 and 2011.

	2011	2010	2009
Current Assets	**$ 152,040.60**	**$ 119,435.76**	**$ 139,037.64**
Total Assets	**$ 789,259.26**	**$ 781,511.79**	**$ 793,888.67**
Current Liabilities	**$ 27,458.62**	**$ 31,092.56**	**$ 25,485.27**
Long term Liabilities	**$ 243,917.20**	**$ 243,917.29**	**$ 280,752.03**
Total Liabilities	**$ 271,375.91**	**$ 276,009.85**	**$ 306,237.30**
Total Income	**$ 234,050.00**	**$ 239,343.35**	**$ 236,730.81**
Total Expense	**$ 223,668.22**	**$ 219,613.08**	**$ 229,375.73**
Net Income	**$ 10,381.78**	**$ 19,730.27**	**$ 7,355.08**

The Board of Directors of SDRC has actively participated in these discussions, ensuring that good communication and clear understandings are in place. The company appreciates the high level of collaboration and client-centered help it has received from CWCB's Water Project Loan Program, and is pleased that the 45-55 percentage split between grant and loan is so manageable and affordable.

Approval of the WSRA grant for this project is required in order for SDRC to receive approval of its loan application. Without this COMBINED package this project would be impossible. This WSRA grant request, when approved, will leverage the remaining 55% of total project costs, providing an affordable way for SDRC to complete this project.

e. The amount of matching funds provided by the applicant via direct contributions, demonstrable in-kind contributions, and/or other sources demonstrates a significant & appropriate commitment to the project.

Construction Project Costs of $2,032,000 plus a loan service fee of $11,176 equals Gross Total Cost of $2,043,176. SDRC is providing a 55% match of Construction Project Costs by securing a loan from CWCB for $1,117,600 plus the 1% service fee for a total loan of $1,128,776. The remaining 45% of Total Project Costs, or $914,400 is requested in this proposal from WSRA funds, with $859,400 from the Statewide Account and $55,000 from the Rio Grande Basin's WSRA Account. Applicant is also providing $50,000 in in-kind Administrative oversight for the project.

Further evidence of the applicant's commitment to this project is its choice of Smith Geotechnical Engineering Consultants as the principal contractor. There is no other entity which has the long years of experience and familiarity with the Gate Tower and the Sanchez system. Smith Geotechnical Engineering has performed several major studies and completed numerous projects for SDRC dating back many years. SGE is also very familiar with CWCB's Water Projects Loan Program and has been instrumental in pulling together the required details of this funding package.

Tier 3: The Water Activity Addresses Other Issues of Statewide Value and Maximizes Benefits

f. The water activity helps sustain agriculture & open space, or meets environmental or recreational needs.

Agriculture: This project sustains agriculture by improving SDRC's ability to store and distribute water. It serves an area of 22,414 acres which are capable of irrigation, with approximately 227 contracts to supply water. The service area of the Sanchez Ditch and Reservoir Company includes 13,424 acres of irrigated crop land and 18,392 acres of farm land which, due to lack of water, are either not irrigated or irrigated in rotation. Sanchez Reservoir irrigates crops which include potatoes, wheat, barley, oats, alfalfa, and hay mixtures.

Environmental: This project helps meet environmental needs by ensuring the continued stability and viability of the Sanchez Reservoir, created by impounding excess runoff from the surrounding Sangre de Cristo Mountains and the creeks and rivers in the vicinity of the Colorado-New Mexico border. Tourism, boating and fishing bring needed funds into one of the poorest communities of Colorado. A letter from Rick Basagoitia of CDPW accompanies this proposal.

g. The water activity assists in the administration of compact-entitled waters or addresses problems related to compact entitled waters and compact compliance and the degree to which the activity promotes maximum utilization of state waters.

Not Part of the Rio Grande Compact: Although this project is not related to the Rio Grande Compact, the efficiencies obtained in this project directly promote maximum utilization of Colorado's water resources, helping to keep water in the Rio Grande Basin and helping to restore its aquifers to a sustainable level.

h. The water activity provides a high level of benefit to Colorado in relationship to the amount of funds requested.

A Good Investment: SDRC is putting up 55% of the money requested through a CWCB loan in order to rehabilitate a large reservoir which is strategically important to irrigators and residents in the Culebra and Sanchez watersheds.

A Financial Return Flow: This project's funding package, combining CWCB's grant and loan programs, represents a benefit to Colorado, providing, in essence, a kind of financial "return flow" by which other projects and other funding commitments are possible.

Leveraging Emerging Technologies and Advances in Science: The upgrade of the Sanchez system brings a century-old facility up to par with today's complex water-management issues and emerging technologies to maximize utilization of our diminishing water supplies.

i. The water activity is complimentary to or assists in the implementation of other CWCB programs.

San Luis People's Ditch: Recently the Rio Grande Basin Roundtable approved a request for funding from the San Luis Peoples Ditch for an upgrade and rehabilitation of their irrigation system. The flood control aspects of the Sanchez Reservoir are critically important in maintaining the integrity of the *acequia* system.

Supporting the San Luis Valley's Improved Methods for Water Control: The Conejos Water Conservancy District received WSRA funding for an automated gauging stations project to electronically track water flows through 72 measuring weirs and four control gages on its system. By automating the operations at Sanchez Reservoir, SDRC gains a head start on the anticipated future configuration of the Sanchez system, to which the recently installed solar-powered and web-based controls can be easily adapted. This project utilizes available technological advances to extend better water management across the whole south-central part of the San Luis Valley.

Part IV. – Required Supporting Material

1. **Water Rights, Availability, and Sustainability** – This information is needed to assess the viability of the water project or activity. Please provide a description of the water supply source to be utilized, or the water body to be affected by, the water activity. This should include a description of applicable water rights, and water rights issues, and the name/location of water bodies affected by the water activity.

The company's decreed water rights and appropriations begin in 1856 and go through 1934 for a cumulative total of 373.950 cfs. Following is a list of the company's water rights.

Sanchez Ditch and Reservoir Company Water Rights

Priority	Ditch Name	Decreed cfs
8	San Acacia	23.250
42	Island	1.500
60,61	Culebra-Eastdale No. 1	48.625
1934-4ST	Sanchez Res. Storage Priority	
1934-11	Culebra-Eastdale No. 1	228.075
1934-5ST	Sanchez Res. Storage Priority	
1934-21	Culebra-Cerritos	37.500
24	Cordillera	35.000
	Total	373.950

This water project does not affect or change applicable water rights, nor does it raise any water right issues.

Inflow to the reservoir comes from Culebra Creek, on which the reservoir is located, and its tributaries, Culebra Creek, San Francisco Creek, Vallejos Creek, Torcido Creek, and from the Culebra Sanchez Inlet Ditch and Canal. Releases from Sanchez Reservoir flow down Ventero Creek into the Culebra above the San Luis gauging station. The release, minus intervening decreed stream water and transportation losses, is diverted from Culebra Creek at the headgate of the Culebra Eastdale Canal, where it is measured at the headgate by a Stevens Type F recorder, and is delivered into the Sanchez Head Stabilization Reservoir.

The Stabilization Reservoir provides a reasonably constant supply to the Sanchez system irrigators below the stabilization reservoir. Releases at this point consist of water previously stored in Sanchez Reservoir and some direct flow decreed water in high runoff periods.

SDRC has a storage right and a decreed direct flow right. This usually occurs during big rains, in spring runoff, and in winter. After November 1st there is no irrigation water, only stock water.

2. Please provide a brief narrative of any related studies or permitting issues.

a) Studies:

2003, November 6 – Division 3 District 24, Division of Water Resources: *Internal Inspection of Outlet Conduit.* Doug Boyer, Dam Safety Branch; Steve Vandiver, Division Engineer; Charlie Quintana, Water Commissioner District 24.

2010, October 20 – ADI Marine, Minot ND, and Prime Machine, Salt Lake City, UT. *Underwater Inspection Report, Outlet Works & Tower at Sanchez Reservoir.*

2011, March 22 – Tramway Engineering, Ltd., Charles R. Peterson, P.E., *Gondola and Tramway Evaluation* with findings regarding personnel safety, creating alternate access, and possible cableway replacement.

2012, May 15 – Smith Geotechnical Engineering, Inc., *Feasibility Study for Outlet Rehabilitation Plan at Sanchez Reservoir*, Duane Smith, P.E., This is the most relevant study pertaining to this project. Smith Geotechnical Engineering Inc. is the Engineering Contractor for this project.

Other studies over the years were listed in the Phase I proposal and, since they are not instrumental to this project, are not included here.

b) Permitting Issues:

Engineer Duane Smith, of SGE, has established that all easements and rights of way are currently held by the company and that no local construction permits or easements are expected to be required for this repair and upgrade project.

The company and SGE believe no Environmental Assessment (EA) or Environmental Impact Statement (EIS) will be required. The Corps of Engineers - Department of the Army (DA) will be notified of the scope of work, but it is likely that most of that work will not fall within their jurisdiction.

This project will include blasting, removing a portion of the outlet tower, and potentially removing silt from the reservoir around the tower. The blasting will require safety and security measures but no special permits are expected associated with the blasting. The draining of the reservoir, which is expected to transport silt, and the potential need to remove silt from around the outlet may require review by the Department of the Army.

3. Statement of Work, Detailed Budget, and Project Schedule

The statement of work will form the basis for the contract between the Applicant and the State of Colorado. In short, the Applicant is agreeing to undertake the work for the compensation outlined in the statement of work and budget, and in return, the State of Colorado is receiving the deliverables/products specified. **Please note that costs incurred prior to execution of a contract or purchase order are not subject to reimbursement**. All WSRA funds are disbursed on a reimbursement basis after review invoices and appropriate backup material.

Please provide a detailed statement of work using the template in Exhibit A. Additional sections or modifications may be included as necessary. Please define all acronyms and include page numbers.

REPORTING AND FINAL DELIVERABLE

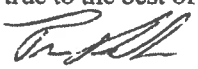
Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 5 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

The above statements are true to the best of my knowledge:

Signature of Applicant: 

Print Applicant's Name: TRAVIS ROBINSON

Project Title: PHASE II OUTLET REHABILITATION & GATE TOWER REPLACEMENT

Return an electronic version (hardcopy may also be submitted) of this application to:

Greg Johnson – WSRA Application
Colorado Water Conservation Board
1580 Logan Street, Suite 200
Denver, CO 80203
gregory.johnson@state.co.us

Exhibit A-1

Statement of Work

WATER ACTIVITY NAME - Sanchez Reservoir Phase II - Outlet Rehabilitation and Gate Tower Replacement

GRANT RECIPIENT – The Sanchez Ditch and Reservoir Company

FUNDING SOURCE – Water Supply Reserve Account 45% of total project costs
CWCB Water Projects Loan Program 55% of total project costs

INTRODUCTION AND BACKGROUND
Provide a brief description of the project. (Please limit to **no more than 200 words**; this will be used to inform reviewers and the public about your proposal).

The Sanchez Ditch and Reservoir Company (SDRC) has completed Phase I of a multi-phase project, addressing identified issues to improve human safety, upgrade/replace deteriorating infrastructure, and cure operational inefficiencies inherent in a reservoir constructed in the late 1800s. Informed by data and recommendations from three engineering studies and a feasibility analysis, SDRC seeks WSRA funds to implement Phase II to adequately meet long term irrigation needs. This project represents a major structural overhaul and operational upgrade of Sanchez Reservoir.

Phase I improved the safety of the gondola and tramway access system; replaced a cylinder in the Gate Tower to improve drawdown; installed a new hydraulic operating system; created solar-powered and web-based remote SCADA control of critical reservoir operations; performed an analysis of the outlet structure; and conducted an engineering evaluation of the current, continued, and long term viability of the Gate-Tower-and-Gondola system. Based on these studies, SDRC has selected the most favorable means to upgrade the Sanchez reservoir system.

Phase II will demolish and remove the gate tower, install new control gates and operators, upgrade the existing outlet conduit and line it with shotcrete, and carry forward the accomplishments of Phase I, including the efficiencies of remote SCADA reservoir control.

OBJECTIVES
List the objectives of the project

To rehabilitate Sanchez Reservoir, ensuring long term dam stability, improving and continuing SDRC's ability to store and deliver irrigation water, reducing risk of flood in the Culebra watershed, preserving critical water storage in the Rio Grande Basin, and achieving major safety upgrades and operational efficiencies.

TASKS

TASK 1 **Insurance Bonds**

TASK 2 **Mobilization, Demobilization**

Description of Task: This task includes all costs to mobilize equipment, tools, safety and sanitary equipment, and consumable supplies to the site. At the end of the project all Contractor owned equipment, tools, safety and sanitary equipment, and supplies will have to be removed from the site.

Method/Procedure: As stated above

Deliverables: All equipment and supplies required to conduct the work required in the contract.

TASK 3 **Demolish Tower**

3a **Demolition – Blasting**

Description of Task: This task will include all work required to remove the upper portion of the concrete tower by blasting.

Method/Procedure: The tower will be prepared for blasting by core drilling and placing charges to topple the tower into the reservoir.

Deliverables: The removal of the portion of the concrete tower above approximately elevation 8330 feet.

3b **Demolition – saw cutting tower**

Description of Task: This task will include saw cutting a notch in the concrete tower to facilitate toppling the tower into the reservoir. A second cut will then be required across the tower to section to provide a uniform section after the blasting has been completed.

Method/Procedure: Use of a cable saw with diamond impregnated cable to cut the concrete.

Deliverables: A notch in the tower to facilitate the demolition and a uniform section cut through the tower base for installation of the gate slab.

3c **Sheetpile Cofferdam**

Description of Task: The cofferdam will be installed to control the water level around the worksite at the base of the tower and facilitate the removal of silt if necessary.

Method/Procedure: Steel sheetpiling will be driven into the dam embankment around the tower using a pile driver suspended from a crane.

Deliverables: A steel sheetpile cofferdam to control the water level around the tower base.

3d Silt Removal – Vacuum Truck

Description of Task: The removal of silt may be necessary at the tower base to facilitate work in the area. It is believed there is approximately 20 feet of silt accumulation at the base of the tower. The removal of silt may be required to seal up the lower gates and to facilitate saw cut the tower at a uniform elevation for slab placement.

Method/Procedure: The removal of silt by excavating and sucking up with the vacuum truck.

Deliverables: A work area free of the silt accumulation expected at the tower base.

3e Crane

Description of Task: A crane will be necessary to hoist equipment into the tower for many phases of the construction and demolition.

Method/Procedure: Utilize the crane to support the demolition of the tower.

Deliverables: A 150 ton crane.

3f Dam Face Construction – Access Road

Description of Task: Provide an access road across the face of the dam to near the tower base.

Method/Procedure: Place compacted earth fill on the dam face parallel to the dam to construct an access road.

Deliverables: Access road to the tower base to facilitate movement of men, equipment, and materials to the tower.

TASK 4 Tower Modifications

4a Concrete Slab

Description of Task: Place a concrete slab over the tower to support the new control gates.
Method/Procedure: Install forms, reinforcing steel, and gate thimbles to place a 3 foot thick 4,500 psi concrete slab. The slab will span the tower base to cap the portion of the tower that was not removed.

Deliverables: Support slab for the new control gates.

4b Concrete Grade Beams 18" x 24"

Description of Task: Construct a concrete support beam for the installation of the gate hydraulic lines and the gate vent pipes.

Method/Procedure: The grade beam will be formed on the face of the dam, reinforcing steel installed, and 4,500 psi concrete placed to provide a structural grade beam.

Deliverables: A concrete grade beam for support of the gate hydraulic lines and the gate vent pipes.

4c Crane

Description of Task: A crane will be necessary to hoist equipment, forms, reinforcing steel, and concrete to construct the new gate slab.

Method/Procedure: Utilize the crane to support the construction of the new gate slab and the installation of the gates.

Deliverables: A 150 ton crane.

4d 5' x 6' Slide Gate + Thimble

Description of Task: Provide a control gate that allow for large discharges to meet the requirements of the State Engineer for emergency discharges.

Method/Procedure: Provide and install new gate and thimble in the gate slab placed over the tower at approximately elevation 8330.0 feet.

Deliverables: Slide gate for emergency water releases.

4e 2.5' x 2.5' Slide Gate & Thimble

Description of Task: Provide a small control gate for normal irrigation water releases.

Method/Procedure: Provide and install new gate and thimble in the gate slab placed over the tower at approximately elevation 8330.0 feet.

Deliverables: Slide gate for control of irrigation releases.

4f Galvanized Trashracks - Supply

Description of Task: Provide galvanized steel trashracks for each gate to stop trash and debris from going through the gates.

Method/Procedure: Fabricate, galvanize, and transport steel trashracks to the project site.

Deliverables: Two galvanized steel trashracks.

4g Install Trashracks

Description of Task: Install galvanized steel trashracks over each gate to control trash and debris from going through the gates.

Method/Procedure: Install steel trashracks over the slide gates installed in the new tower slab. Trashracks will be bolted to the slab such that they can be removed if required to work on the gates.

Deliverables: Galvanized steel trashracks installed to control debris through the outlet control gates.

4h Vent Pipe

Description of Task: Install air vent pipe for the control gates to facilitate flow and prevent cavitation.

Method/Procedure: Install steel air pipes from the gate support slab to near the top of the dam to vent the intake structure. The piping will be supported by the concrete grade beam and will be strapped and bolted to the beam.

Deliverables: Piping installed to properly vent the intake structure during water releases.

4i Install Gates

Description of Task: Place gates onto the thimbles that have been cast into the new gate slab over the tower base.

Method/Procedure: The gates will be hoisted into place with a crane and bolted onto the thimbles.

Deliverables: Two slides gates installed that will control water releases.

4j Hydraulic Cylinder

Description of Task: Design, fabricate, and supply stainless steel hydraulic cylinders that will operate the slide gates.

Method/Procedure: The stainless steel cylinders will be supplied and transported to the site for installation on the gate support slab.

Deliverables: Hydraulic cylinders which are used to provide the force to open and close the slide gates.

4k HPU unit to operate Gates + S.S. pipe

Description of Task: To provide the hydraulic control unit including pumps, valves, piping, and control system to open and close the gates.

Method/Procedure: Design and fabricate the hydraulic control unit and transport to the site to be installed in the control house at the crest of the dam.

Deliverables: Functional hydraulic control unit that supplies the hydraulic pressure necessary to open and close the slide gates.

4l Install Cylinders and Piping

Description of Task: Install the stainless steel hydraulic cylinders and associated piping mounted on the new concrete tower slab.

Method/Procedure: The stainless steel cylinders will be supplied and installed on the gate support slab by bolting mounting brackets to the concrete slab. The hydraulic lines will be installed on the concrete grade beam that traverse the dam face from the gate support slab to the control house at the dam crest.

Deliverables: Hydraulic cylinders installed to provide the force to open and close the slide gates.

4m Precast Concrete Control House – 10' x 12'

Description of Task: Provide a precast concrete enclosure suitable for housing the gate control system.

Method/Procedure: Form and place a concrete base slab at the dam crest and set the precast concrete control house on the base slab.

Deliverables: Secure enclosure for the gate control system.

TASK 5 Repair Outlet Conduit – Shotcrete

5a Chipping, Patching, Sealing Joints

Description of Task: This task will include all preparation required prior to placing the shotcrete lining on the outlet conduit.

Method/Procedure: All deteriorated concrete will be chipped and removed, leaking joints sealed with epoxy grout, and deteriorated reinforcing steel removed. The conduit will be prepared using hand tools and water blasting to provide a sound substrate for applying the shotcrete.

Deliverables: Outlet conduit will be ready for placement of shotcrete.

5b Patching Materials - grout/rebar/epoxy

Description of Task: Supply the materials used to prepare the outlet conduit for the shotcrete lining.

Method/Procedure: Supply and transport materials to the project site for use in lining the conduit.

Deliverables: All materials necessary for preparation for lining the outlet conduit.

5c Sandblast

Description of Task: To clean the concrete walls and floor slab to remove all deleterious substances prior to placing the shotcrete.

Method/Procedure: Sand blasting or water blasting equipment will be used to clean the outlet conduit and remove all loose concrete, dirt, and mold from the existing concrete to provide a sound substrate to apply the shotcrete.

Deliverables: Outlet conduit prepared and cleaned prior to placing shotcrete.

5d Shotcrete Application (6")

Description of Task: To apply a shotcrete lining to the outlet conduit walls and roof to increase the structural integrity and durability against erosion and freeze thaw action.

Method/Procedure: Apply a 6 inch layer of shotcrete to the conduit walls and roof by spraying on application.

Deliverables: A completed shotcrete (concrete) lining on the outlet conduit walls and roof.

5e Reinforcing Steel

Description of Task: The installation of reinforcing steel in the walls and roof of the outlet conduit to increase the structural integrity and facilitate bond/attachment of the shotcrete.

Method/Procedure: Install reinforcing steel, #4 @ 4 inches on center each way, along the face of the outlet conduit walls and roof prior to placing shotcrete. Standoffs will be drilled and grouted into the existing concrete for use in supporting the reinforcing steel.

Deliverables: Reinforcing steel cage placed along the conduit walls and roof prior to placing shotcrete.

5f 6" Floor Slab + Rebar

Description of Task: To provide a structurally sound floor slab in the outlet conduit.

Method/Procedure: A 6 inch concrete slab will be placed over the existing slab that is deteriorated throughout its length. Reinforcing steel will be placed and secured to the existing slab with standoffs and 4,500 psi concrete then placed throughout the conduit.

Deliverables: Sound concrete floor slab throughout the outlet conduit.

TASK 6 Outlet Structure Rehabilitation

6a Demolition – right side only

Description of Task: Remove deteriorated portions of the existing outlet control and energy dissipation structure located at the downstream end of the outlet conduit.

Method/Procedure: Utilize an excavator and pavement breaker to demolish the right side of the existing outlet structure.

Deliverables: Structure prepared for rehabilitation.

6b Saw Cutting

Description of Task: Part of the demolition of the existing structure.

Method/Procedure: Saw cut walls intersections and base slab intersections as necessary to demolish only the deteriorated portions of the outlet structure.

Deliverables: Structure prepared for rehabilitation.

6c Concrete – right side walls and floor slab

Description of Task: Replace the deteriorated portions of the walls and floor slab of the outlet structure removed by demolition.

Method/Procedure: The floor slab and walls will be formed, reinforcing steel placed, and 4,500 psi concrete placed using a pump truck.

Deliverables: Rehabilitated outlet structure that is structurally sound and provided proper energy dissipation for reservoir releases.

6d Sand Backfill

Description of Task: Provide backfill for the right side wall that was replaced that is free draining.

Method/Procedure: The sand backfill will be placed over the slotted drain pipe to collect seepage along the right side of the outlet structure. The backfill will be placed in 12 inch lifts and compacted to 70% relative density.

Deliverables: Collection system to control seepage along the right side of the outlet structure.

6e Earth Backfill

Description of Task: The backfill for the upper portions of the outlet structure walls will be done so with earth type materials.

Method/Procedure: Earth backfill adjacent to the outlet structure walls will be placed with an excavator in approximately 12 inch lifts and compacted to 95% of Standard Proctor density. This will only be for the upper 3 feet of the backfill over the sand backfill.

Deliverables: Earth backfill to seal the top portion of the wall from surface water infiltration.

6f Slotted Drain Pipe

Description of Task: Install a perimeter drain along the right side of the outlet structure to control seepage.

Method/Procedure: Place a 12 inch slotted drain pipe along the right side of the structure and backfill with free draining sand. The pipe will be placed to discharge downstream of the outlet structure with the discharge measured by a weir.

Deliverables: Collection system to control seepage along the right side of the outlet structure.

6g Excavation – Rock

Description of Task: Excavation along the right side of the outlet structure prior to removal of the existing wall.

Method/Procedure: An excavator and pavement breaker will be used to excavate the rock along the existing outlet structure wall to facilitate demolition of the wall and the installation of the drain system.

Deliverables: Wall exposed for demolition.

6h Excavation – Earth

Description of Task: Excavation along the right side of the outlet structure prior to removal of the existing wall.

Method/Procedure: An excavator will be used to excavate the earth materials along the existing outlet structure wall to facilitate demolition of the wall and the installation of the drain system.

Deliverables: Wall exposed for demolition.

6i Rip-Rap – Excavated Rock – place only

Description of Task: Erosion protection of the downstream channel below the outlet structure.

Method/Procedure: The rock excavated along the right side of the outlet will be used and placed with an excavator for riprap erosion protection of the downstream channel.

Deliverables: Erosion protection of the downstream channel.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Exhibit A-2
BUDGET

Provide a detailed budget by task including number of hours and rates for labor and unit costs for other direct costs (i.e. mileage, $/unit of material for construction, etc.). A detailed and perfectly balanced budget that shows all costs is required for the State's contracting and purchase order processes. Sample budget tables are provided below. Please note that these budget tables are examples and will need to be adapted to fit each individual application. Tasks should correspond to the tasks described above.

(next page please)

TABLE A-3
REPAIR ALTERNATIVE 3
DEMOLISH TOWER & REPLACE GATES
Sanchez Reservoir Outlet

TASK	DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	SUBTOTALS
1.	Insurance, Bonds	1	L.S.	$ 23,200.00	$ 23,200
2.	Mobilization, Demobilization	1	L.S.	$ 108,500.00	$ 108,500
3.	Demolish Tower				
	Demolition - blasting	1	L.S.	$ 55,500.00	$ 55,500
	Demolition - saw cutting tower	1	L.S.	$ 16,700.00	$ 16,700
	Sheetpile Cofferdam	3600	S.F.	$ 13.50	$ 48,600
	Silt removal-Vacumn Truck	5	Days	$ 2,200.00	$ 11,000
	Crane	5	Days	$ 2,400.00	$ 12,000
	Dam Face Construction Access Road	1500	C.Y.	$ 9.00	$ 13,500
					$ 157,300
4.	Tower Modifications				
	Concrete Slab	31	C.Y.	$ 1,300.00	$ 40,300
	Concrete Grade Beams - 18"x24"	35	C.Y.	$ 900.00	$ 31,500
	Crane	10	Days	$ 2,400.00	$ 24,000
	5' x 6' Slide Gate + Thimble	1	Each	$ 49,600.00	$ 49,600
	2.5' x 2.5' Slide Gate +Thimble	1	Each	$ 24,400.00	$ 24,400
	Galvanized Trashracks -supply	2200	L.B.	$ 7.00	$ 15,400
	Install Trashracks	24	Hrs	$ 56.00	$ 1,300
	Vent Pipe	320	L.F.	$ 11.00	$ 3,500
	Install Gates	72	Hrs	$ 56.00	$ 4,000
	Hydraulic Cylinder	1	L.S.	$ 71,000.00	$ 71,000
	HPU unit to Operate Gates + S.S. pipe	1	Each	$ 111,000.00	$ 111,000
	Install Cylinders + Piping	120	Hrs	$ 56.00	$ 6,700
	Precast Concrete Control House -10' x 12'	13	C.Y.	$ 900.00	$ 11,700
					$ 394,400
5.	Repair Outlet Conduit - Shotcrete				
	Chipping/Patching/Sealing Joints	360	Hrs	$ 55.00	$ 19,800
	Patching Materials - grout/rebar/epoxy	1	L.S.	$ 5,600.00	$ 5,600
	Sandblast	14725	S.F	$ 11.00	$ 162,000
	Shotcrete Application (6")	275	C.Y.	$ 1,700.00	$ 467,500
	Reinforcing Steel	17	Tons	$ 1,900.00	$ 32,300
	6" Floor Slab + rebar	85	C.Y.	$ 1,000.00	$ 85,000
					$ 772,200
6.	Outlet Structure Rehabilitation				
	Demolition- Right Side Only	16	Hrs	$ 300.00	$ 4,800
	Saw cutting	1	L.S.	$ 2,800.00	$ 2,800
	Concrete - right side walls and floor slab	50	C.Y.	$ 900.00	$ 45,000
	Sand Backfill	315	C.Y.	$ 20.00	$ 6,300
	Earth Backfill	100	C.Y.	$ 10.00	$ 1,000
	Slotted Drain Pipe	75	L.F.	$ 20.00	$ 1,500
	Excavation - Rock	220	C.Y.	$ 30.00	$ 6,600
	Excavation - Earth	100	C.Y.	$ 20.00	$ 2,000
	Riprap - excavated rock - place only	120	Tons	$ 20.00	$ 2,400
					$ 72,400
				TOTAL CONSTRUCTION COST>>>>>>>>>>>>>>>>>>>	$ 1,528,000
				CONTINGENCY >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	$ 279,000
				ENGINEERING DESIGN + CONSTRUCTION >>>>>>>>>>	$ 225,000
				TOTAL>>	$ 2,032,000

PLUS 1% Loan Service Fee $11,176 = GROSS TOTAL COSTS $2,043,176

Exhibit A-3

SCHEDULE

Provide a project schedule including key milestones for each task and the completion dates or time period from the Notice to Proceed (NTP). This dating method allows flexibility in the event of potential delays from the procurement process. Sample schedules are provided below. Please note that these schedules are examples and will need to be adapted to fit each individual application.

Project Completion In Less Than One Year --- With Flexible Timing to Anticipate Conditions

Task	First 6 Months						Second 6 Months						Yr 2	Yr 3	Yr 4	Yr 5
#1 Insurance Bonds																
#2 Mobilize/Demobilize																
#3 Demolish tower																
#4 Modifications																
#5 Repair Conduit																
#6 Rehabilitate Outlet																
Final Reports																

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 5 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.

Exhibit B – Project Map

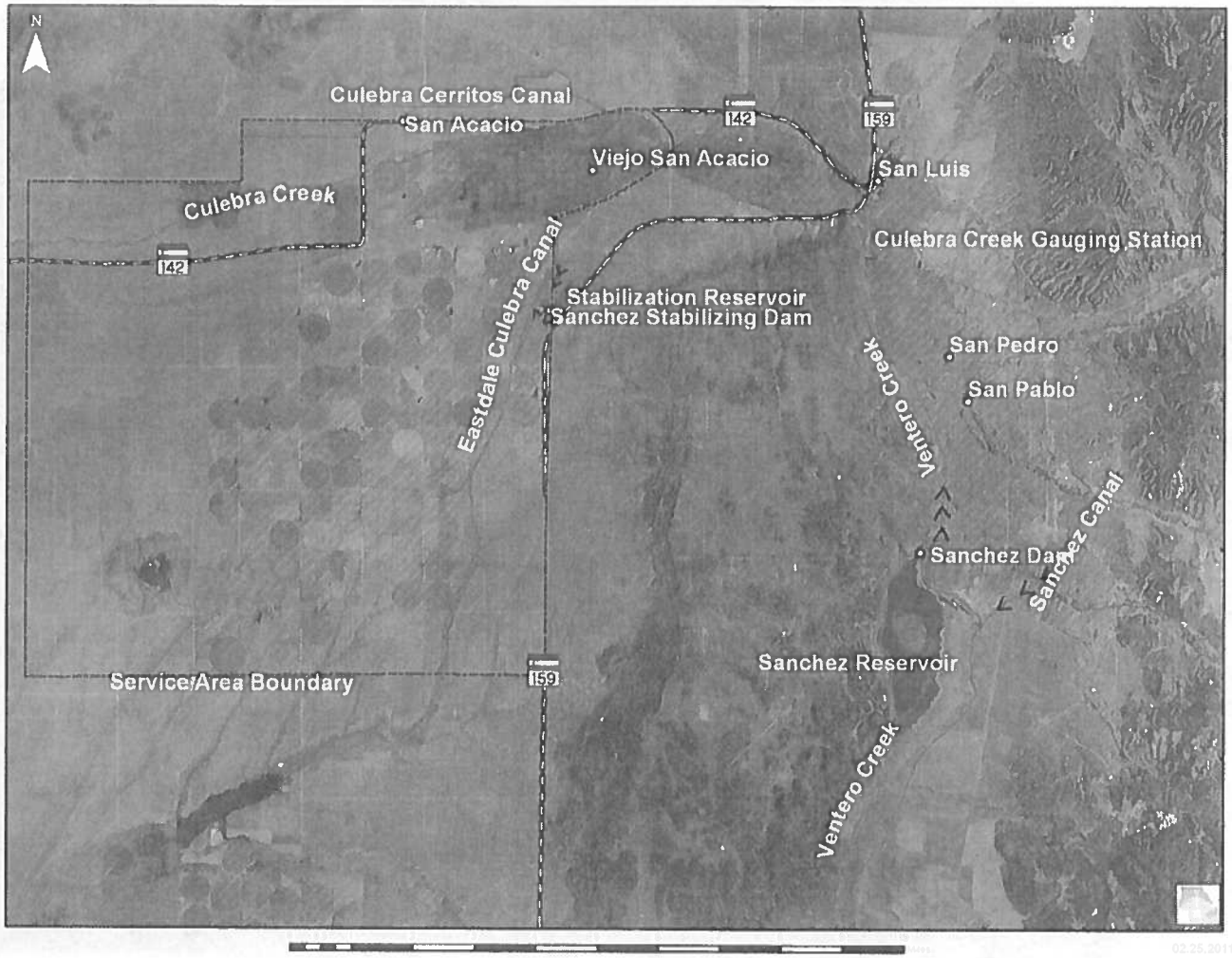

N
Culebra Cerritos Canal
San Acacio
142
159
Viejo San Acacio
San Luis
Culebra Creek
Culebra Creek Gauging Station
142
Eastdale Culebra Canal
Stabilization Reservoir
Sanchez Stabilizing Dam
San Pedro
San Pablo
Ventero Creek
Sanchez Canal
Sanchez Dam
Sanchez Reservoir
Service Area Boundary
159
Ventero Creek

Exhibit C-1
Excerpts from Feasibility Study
February 28, 2012
Smith Geotechnical Engineering, Inc.
Duane Smith, P.E.

NEED FOR THE PROJECT

The SDRC is undertaking this project to continue to provide irrigation water to its shareholders to irrigate their crops.

The Sanchez Reservoir Gate Tower was constructed in 1910. The gate tower is approximately 135 feet in height with eight sets of 30-inch diameter valves located at different elevations in the tower. The general location and distribution of the various intake gates on the tower are shown on Figure 1 in Appendix B [of the Feasibility Study].

Each set of the existing valves consists of a steel thimble through the concrete tower wall with a sluice gate mounted on the outside flange of the thimble. The water exits the gate tower, through two 48-inch diameter wedge gate valves and one 30-inch diameter fixed cone valve which discharges into the a 10 ½ foot high concrete outlet conduit which is approximately 600 feet in length.

The two 48-inch diameter valves the cone valve are new valves that were replaced in 1997. The three 30-inch diameter valves and operators located at about elevation 8345 feet were replaced in 1997; the three 30-inch diameter valves and operators located at about elevation 8375 feet were repaired; and the two 30-inch diameter valves and operators located at about elevation 8330 feet are buried under silt and were not repaired. The outlet conduit was not repaired in 1997 when the tower controls, valves, and ladders were rehabilitated.

PHOTOGRAPH 1 - TOWER

The lower portion of the conduit is deteriorated, has been eroded, and has reinforcing steel exposed in many locations. Repair of portions of the conduit is deemed necessary to maintain its structural integrity and to maintain the safety of the dam.

The exterior of the gate tower was coated by the SDRC in 1993. This coating has generally de-bonded and peeled off the tower and does not appear to have reduced the deterioration of the concrete. This can be seen in Photograph 2.

The tower deterioration needs to be addressed to ensure the structural integrity of the tower is maintained over the next 75 years. Due to continued deterioration of the Tower and the outlet conduit and due to changing system needs, the SDRC has initiated this study to formulate a plan to upgrade the system.

The areas of concern and the tasks outlined to address these concerns are as follows.

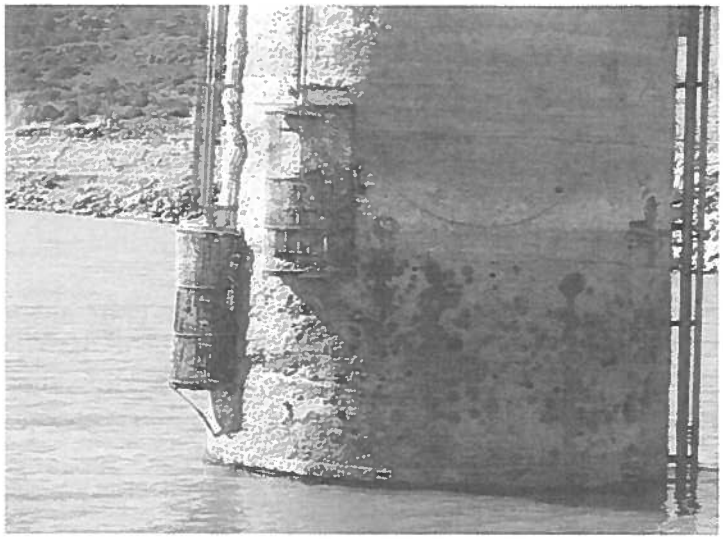
[PHASE ONE – This phase was completed in June, 2012.]

Task 1 - Evaluate/Upgrade Gondola and Tramway. This will address the safety and structural integrity concerns of the gondola and provide for the long term use of the system.

Task 2- Cylinder Repair and Replacement. One of the lower 30 inch intake control gates will be repaired to increase the reservoir discharge capacity.

Task 3 - Replace and Automate Hydraulic Control System. This will upgrade the gate control system to automate essential reservoir operations; provide a secure and safe "vandal proof" control system; provide for remote control operation; and, provide a system for capturing, managing, reporting, and tracking the reservoir operations.

Task 4 - Feasibility of Outlet Configuration. This study will evaluate the long term viability of the control tower and outlet conduit with regard to maintenance, structural integrity, and durability. Options for alternatives to the current configuration of gates and operators in the gate control tower will be explored.



PHOTOGRAPH 2 – OUTLET TOWER DETERIORATION

TOWER INSPECTION

The exterior surface of the outlet tower was visually inspected by Duane H. Smith, P.E. on November 1, 2011. For the exterior of the tower, this inspection was from a distance due to the tower's inaccessibility. The lower portion of the interior of the tower was inspected by entering through the outlet conduit and then through one of the 48 inch gates.

The main area of concern is for the deterioration and damage on the exterior of the tower. The tower has experienced light to severe deterioration of the concrete, especially in the zone of water level fluctuations. This can be seen in Photograph 2. Some of the spalling appears to be as deep as several inches and is due to the freezing of water in the concrete. This appears to be combined with the "pop out" of large aggregate in the mix that most likely is not bonded well by the cement.

The concrete surface has spalled due to moisture intrusion and freeze thaw. The concrete in the tower would not be air entrained, based on the date of construction. Concrete without air entrainment is highly susceptible to freeze-thaw action and the deterioration noted would not be unexpected. Also, the quality and quantity of the cement used would not be expected to be high thus the strength would not be expected to be very high. Cores were not removed from the tower itself but cores of the concrete were taken from the outlet conduit as shown in Photograph 4. Based these cores, we have ascertained the strength of the concrete is generally expected to be less than 2,500 psi. The cement to aggregate bond of the concrete in the cores was not good and damage due to freeze-thaw would be expected.

[Even for concrete mixtures today, which are designed to withstand the level of freeze-thaw action the tower experiences, these conditions would still be a challenge.] The use of air

entraining agents and the minimum strength requirement of 4,500 psi is the norm today. The low quality of the concrete mix on the tower cannot be expected to adequately resist deterioration under the conditions to which it is subjected.

The only way to eliminate or reduce future the spalling and deterioration is to minimize the water penetration into the concrete. Since the concrete does not have air voids that allow for expansion of the moisture as it freezes, the moisture has to be minimized as much as possible. The complete elimination of moisture penetration is not possible and thus future maintenance of the tower can be expected. The goal would be to use a protective system that minimizes the deterioration to an acceptable level and extends the life of the tower.

The inspection of portion of the interior of the tower does not indicate deterioration of the concrete. Based on this inspection and out inspection of the tower when work was done in 1997, we do not believe concrete in the interior requires any repair. Excessive cracking of the concrete has not been observed and leakage through the joints is not apparent.

TOWER STRUCTURAL ANALYSIS

The tower was analyzed for ice, wind, and seismic loads. The analysis methods used were simplified and intended to produce order of magnitude results. This analysis was to determine the general structural capacity in comparison with the magnitude of the applied loads. Based on the performance of the tower, it appears to be designed adequately for the normal loads applied. However, there are conditions that could be applied that the tower has not experienced; a significant earthquake event and full reservoir. To our knowledge the reservoir has never full to the spillway level. The maximum reservoir level of record is elevation 8412 feet which is 13 feet less than full reservoir condition. The normal high water level condition during an average year is usually less than 50,000 acre-feet which corresponds to an elevation of 8404 feet.

The reservoir full with ice would create a much greater overturning moment at the base and a much greater concrete and steel stress at the tower to base slab interface than it has seen in the past. Using the ice load of 10 kips per linear foot, as recommended by the Bureau of Reclamation, with a water elevation at 8425 feet, the Factor of Safety against overturning was calculated to be greater than 1.7. The maximum bending stress due to the ice load is approximately 250 psi which is very low.

The analysis of the wind load on the tower, using the full tower height, indicates a Factor of Safety against overturning greater than 6.5. This is very conservative as the water/silt around the tower would never be below elevation 8340.

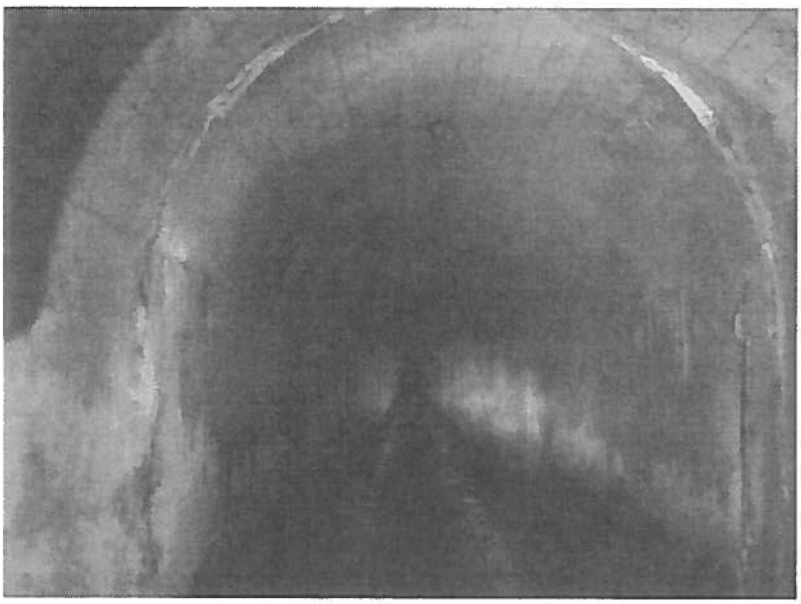
The analysis of the earthquake loads on the tower, without consideration of hydrodynamic loads, was determined to be a Factor of Safety against overturning of 3.6. The concrete and steel stresses at the base of the tower walls would be approximately 140 psi under the loading assumed. This analysis was conducted using a horizontal and vertical seismic load equal to 5% of the tower and base slab weight. This is based on the Corps of Engineers Manual EM 1110-2-1902 which indicates this as an appropriate loading for a dam in this region. A more detailed

analysis may yield different results. However, for the current level of study we believe this analysis is appropriate to determine the general magnitude of loads and order of magnitude of the potential problems with the tower. Before any structural changes are made, a more detailed study would be recommended.

Based on our analyses of the tower and our past and current inspections, we believe the tower is adequate structurally and can provide a long term level of use if the exterior is properly protected against further damage and deterioration from freeze-thaw.

OUTLET CONDUIT INSPECTION

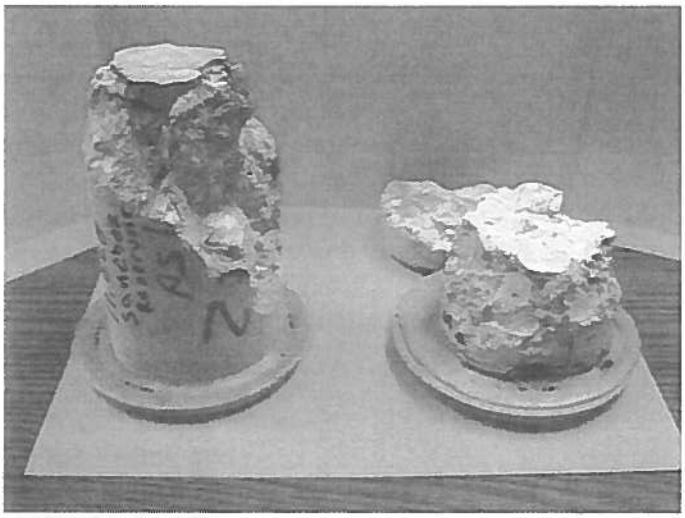
The outlet conduit was inspected visually by Duane Smith, P.E. of SGE on November 1, 2011. Photograph 3 show the general condition and shape of the conduit.



PHOTOGRAPH 3 – OUTLET CONDUIT

The conduit was subsequently inspected and cores removed from the lower reaches on November 22, 2011 by personnel from SGE and SDRC in a joint effort. More cores were planned but the removal of the cores proved somewhat difficult due to water and as the wedge anchors used did not hold well. This is believed to be due to the poor quality of the concrete and also due to the unbounded cementitious material in the concrete.

Two 3 inch diameter cores were removed from the conduit and subsequently tested for compressive strength. The strength of the two cores shown in Photograph 4 were 1,244 psi and 2,212 psi. Note the de-bonding of the aggregate in the core on the right, which was the higher strength core.



OTOGRAPH 4 – OUTLET CONDUIT CORES

Based on these cores, we have ascertained the strength of the concrete is generally expected to be less than 2,500 psi. Based on our visual inspection of the cores, we have determined the cementitious portion contained a significant percentage of non-pozzolanic material that did not hydrate. A large amount of loose powdery type non-hydrated residue was found throughout the cores. This material appears to inhibit bonding of the cement-aggregate mixture. There is visual evidence that the aggregate was most likely dirty which inhibits bonding and decreases the strength. The aggregate gradation and distribution was also poor and not uniform and appears to be gap graded.

The outlet conduit on the downstream end, where freeze thaw has taken place, has deteriorated significantly and eroded. Photograph 5 shows the erosion of the concrete that has resulted. Most of the outlet conduit walls and roof, as can be seen in Photograph 3, are not eroded or significantly cracked. The majority of the outlet appears to be structurally sound as no significant movement or stress cracks were noted in this inspection. This is surprising due to the size and thickness of the walls and roof section, the low strength of the concrete, and the poor reinforcing steel placement.

Other problems noted by our inspection include leakage at several of the construction joints, especially on the sidewalls, and reinforcing steel placement problems. Photograph 6 shows leakage at a sidewall joint and Photograph 7 shows minor staining from leakage at an overhead joint. There are several areas where the reinforcing steel does not have proper cover and is at the face of the concrete or actually exposed as in Photograph 9. Photograph 8 shows a patch which

appears to have been applied during the original construction, most likely to cover the reinforcing steel where it was exposed on the face. There are many areas, especially on the lower end of the conduit, that have a surface patch that appears to have been applied to cover the reinforcing steel. It would appear shifting of the reinforcing steel during concrete placement was a major problem, at least for a portion of the project. We do not see the same type of problems on the tower.

The floor slab is deteriorated from erosion due to discharge flows. The erosion appears to have removed from 1-inch to as much as 3-inches from the floor slab. This erosion would be expected with the low strength of the concrete and poor bonding noted in the cement-aggregate matrix. The floor does not appear to be cracked significantly and the only seepage noted in the floor is near the upstream end of the conduit as shown in Photograph 10. Clear water is discharging from the hole at an estimated rate of approximately 3 to 5 gallons per minute. We attempted to fill the hole with water plug grout and also with a polyurethane foam and were unable to plug hole long enough for it to set. There is enough pressure that we were unable to jamb the hole with rags without them being blown out.

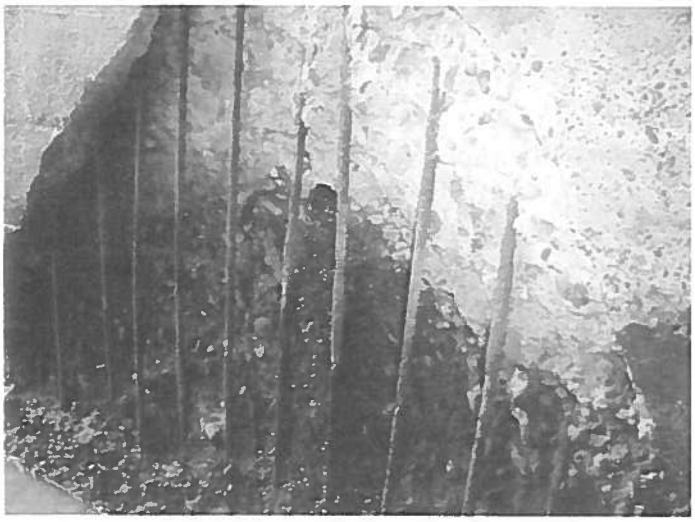


PHOTO #5 – CONCRETE EROSION

PHOTO #6 – CONSTRUCTION JOINT LEAKAGE