Rio Grande Inter-Basin Roundtable
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CORRECTED – June 8, 2011 June 6, 2011

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

Mr. Eric Hecox, Manager, Office of Interbasin Compact Negotiations
Colorado Department of Natural Resources

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

Reference: SANCHEZ RESERVOIR REHABILITATION - PHASE 1 ASSESSMENT & UPGRADE

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 objectives of the *Sanchez Reservoir and Rehabilitation Phase I Assessment & Upgrade*, are to address current and future operating issues of the Sanchez Reservoir, which is owned and operated by the Sanchez Ditch and Reservoir Company (SDRC). These issues include personnel safety, the current operating equipment associated with the outlet works, and to study operating alternatives that can be applied for the long-term safe and efficient operation of the Sanchez Reservoir.

The R.G.R.T. is now requesting authorization to distribute $10,000.00 of Rio Grande Basin Funds, and $85,000.00 of Statewide Funds pursuant to SB 2005 -179.

At the regular R.G.R.T meeting on May 10, 2011, RGRT Members voted unanimously to request funding from SB 2005 - 179 for:

PROJECT AND AMOUNT REQUESTED	SOURCE SB 179
Sanchez Reservoir and Rehabilitation - Phase 1 Assessment & Upgrade	**BASIN $10,000.00 & STATEWIDE $85,000.00**

The applicant is the SDRC which is a Colorado Mutual Ditch Company, incorporated in 1956. SDRC administers an irrigation system with approximately 227 contracts to supply water, serving an area of about 22,400 acres which are capable of being irrigated in Costilla County, Colorado. The "Sanchez System" came into being with SDRC's purchase from the San Luis Power and Water Company in February, 1956, of certain physical structures including (but not limited to) Sanchez Dam and Reservoir, the Culebra Sanchez Canal, Mesita Reservoir, the Culebra Eastdale Canal, and the various canals, ditches, and diversion structures now comprising the Sanchez system. In addition to the physical property, certain decreed water rights, both direct flow and storage, were included in the transaction. The company's facilities, built between 1910 and 1915, consist of the Sanchez Reservoir, with a full reservoir storage capacity of over 103,000 acre feet; the Sanchez Head Stabilization Reservoir, with capacity of about 250 acre feet; approximately 38 miles of concrete-lined ditch; approximately 15 miles of earthen ditch; approximately 23 miles of canal; and a diversion structure at the inlet of Culebra Sanchez Canal.

The service area of the Sanchez Ditch and Reservoir Company includes some 13,000 acres of irrigated crop land and about 18,000 acres of farm land which, due to lack of water, are either not irrigated or irrigated in rotation. Sanchez Reservoir serves 86 land owners whose crops include potatoes, wheat, barley, oats, alfalfa, and hay mixtures.

The Sanchez Reservoir dam is a 135 foot high earth fill dam which impounds 103,000 acre-feet of water. The reservoir is impounded by two separate earth fill dams: a Main Dam and an East Dike. The Main Dam, 135 feet in height and 1,170 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.

A unique feature of the SDRC system is the outlet structure of Sanchez Reservoir, a 150-foot high, free-standing concrete outlet gate tower in the reservoir at the upstream end of the outlet tunnel, with an octagonal-shaped room at the top of the tower which 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 on the tower's walls. The cylindrical tower has an inside diameter of 15 feet and a height of 135 feet from its base to the gate-operating platform at the top. The outlet tunnel consists of an inverted U-shaped cast-in-place concrete conduit through the base of the dam, with a width of 8 feet, a height of 10.5 feet, and a length of 576.5 feet. At the downstream end of the conduit, flow is discharged through a concrete flume structure to Ventero Creek. .

A second unusual feature of this system consists in the use of a tramway and gondola as the primary means of gaining access to the top of the gate tower for operation and maintenance. The gondola runs on a fixed cable and a second cable, which is run around a drum, and is driven by a

portable gasoline generator which winches the gondola from the shore to the tower. Access to the tower is an integral part of the operation of the reservoir, since all valves are controlled from the control room at the top of the tower. Daily access to the tower is required during irrigation season, from May through October.

After a century of faithful operation, with an excellent history of meeting irrigation needs and complying with dam safety requirements, SDRC proposes to conduct some critical repairs and upgrades and seeks to determine the best means of improving operational efficiency for the next 50 to 75 years.

This funding request if for Phase 1 of a multi-phase upgrading and rehabilitation of the operations of the Sanchez Reservoir, beginning with issues of operators' safety, continuing with infrastructure and operational improvements, and culminating with SDRC bringing its entire system into the 21st Century in terms of efficient and precise water management and operational best practices.

The elements of Phase 1 include:

- Addressing the ongoing safety of its employees, anticipating and addressing problems caused by the continued deterioration of 100-year-old structures and conveyance systems which are critical in operating and maintaining the reservoir. Ladders, walkways and operator stem guides below elevation 8375 inside the tower are in poor condition. The gondola system, which is used daily by SDRC employees in irrigation season, was last inspected fifteen years ago. With matching funds of its own, SDRC secured the services of Tramway Engineering, Ltd. to inspect the cableway, carrier, cables and drive systems for the cableway; to review the history, operations, maintenance and upgrade options of the cableway; and to produce the report in identifying the safety, operational and maintenance issues of the gondola system.
- SDRC will rehabilitate the gondola and address issues associated with the cable system based on the recommendations of the tramway study, and upgrade ladders, etc. in the tower.
- In order to adequately meet irrigation needs at high levels of reservoir storage, all gates and valves need to be operational to meet the State's recommended drawdown of 1 foot per day over 5 days. SDRC will take immediate measures to rehabilitate the operators and upgrade faulty and inoperable gates and valves, and the associated hydraulic activation system. This will enable SDRC to more efficiently store and release water for irrigation, improve flood control capabilities, maintain dam safety requirements, and reduce maintenance expense.
- The upgrading of hydraulic activation system will include the automation of the system. Automated systems will be designed, installed and monitored for optimal operation by Colorado Digital Labs, a San Luis Valley-based electronic design engineering firm. The power supply at the tower, which is currently a gasoline driven generator, will be replaced by a solar powered system. This work will reduce labor and maintenance costs, replace outlet guesstimates with accurate measurement and control, and greatly improve efficiency.
- A study will be performed as to the long-term operating alternatives available. This will include an evaluation of the current configuration of gate tower and tramway system in terms of current, continued, and long term operational viability, determining the best means of upgrading the existing system or, if keeping it is deemed not advisable, identifying the best available alternative to assure ease of access to and efficient operation of the reservoir. SDRC has secured a proposal to perform this evaluation from

Smith Geotechnical Engineering Consultants, the engineering firm which has worked on the reservoir before and did a major valve repair feasibility study in 1997. This study will also include a preliminary evaluation of the possibility of installation of a micro hydro system.

SDRC is providing matching funds of $33,100.00 as follows: $4,600.00 for the inspection of the gondola and cableway system as above, $22,400.00 for rehabilitation of the tramway and upgrades to the gate tower and $6,160.00 for hydraulic cylinder repair and replacement1.

Total WSRA funds of $95,000.00 will be applied as follows:

- $40,000.00 for the new hydraulic system and valve repairs as described above.
- $31,900.00 for solar electrical power at the reservoir and for the design, installation and testing of an automated control system.
- $13,500.00 for the assessment and analysis of the existing configuration of tower-and-tramway, with suggested alternative configurations, and evaluation of micro-hydro.
- $9,600.00 for SDRC administration and Final Report.

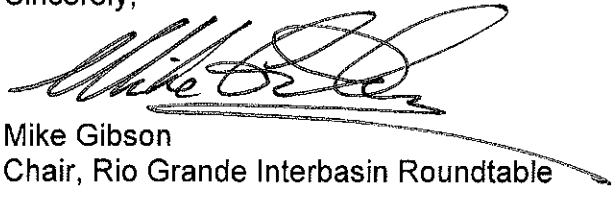
Subsequent Phases of the overall project will implement the recommendations made in Phase 1:

- Relating to the configuration of the system, or, if major changes are advised, will factor those recommendations into future planned upgrades
- Repair the spalling on the concrete exterior of the gate tower and repair deteriorated concrete on the outlet structure.

On behalf of the R.G.R.T. members, we appreciate the Board's consideration of this request and urge your support to the fullest extent possible. Enclosed are the application and supporting materials for the Project. If you require additional information, please notify me accordingly.

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