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San Juan/
Chama
Project Water
Use

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PROJECT AUTHORIZATION

The San Juan/Chama (SJ/C) Project was authorized by Congress in 1962 through Public Law (P.L.) 87-483, which amended the Colorado River Storage (CRS) Act of 1956 (P.L. 84-485) to allow diversion of Colorado River Basin water into the Rio Grande Basin, New Mexico. The original planning projections for the SJ/C Project contemplated an ultimate diversion of 235,000 acre-feet (ac-ft) per year, with an initial phase development of 110,000 ac-ft. The initial phase is all that was authorized (by P.L. 87-483) and subsequently constructed. The project takes water from the Navajo, Little Navajo, and Blanco rivers, which are upper tributaries of the San Juan River, itself a tributary of the Colorado River, for use in the Rio Grande Basin, New Mexico. The New Mexico Interstate Stream Commission is responsible for prioritizing which entities can contract for the water and what their allocation will be.

PROJECT FEATURES

Only Phase One of the SJ/C Project was authorized and built. Full development of the project included an additional thirty miles of tunnels, and three regulating reservoirs in the San Juan Basin. The complete project could have

made year-round deliveries possible with a legislated allowable maximum annual diversion of 270,000 ac-ft, that included three units, the Cerro, Taos, and Llano.

The SJ/C Project that was built includes three diversion dams in the San Juan Basin of Colorado—the Blanco, Little Oso, and Oso, and includes three tunnels totaling 27 miles. The project included Heron Dam, modification to El Vado outlet works, and the Pojoaque Unit, which includes Nambe Falls Dam.

Project Diversion Dams and Tunnels

The northern most facility is Blanco Diversion Dam on the Rio Blanco. It diverts water to Blanco Tunnel, with a capacity of 520 cubic feet per second (cfs), and transports water 8.6 miles from the Rio Blanco southward to the Little Navajo River. There the Little Oso Diversion Dam diverts flows up to 150 cfs, from the Little Navajo River to the Oso Tunnel, and joins with flows from Blanco Tunnel. Oso Tunnel is a concrete lined structure with a capacity of 650 cfs, is 5.1 miles long and transports water from the Little Navajo River to the Navajo River. The southern most facility is Oso Diversion Dam, which can divert up to 650 cfs from the Navajo River to Azotea Tunnel to join with flows from Oso Tunnel. The 12.9 miles of concrete lined Azotea Tunnel has a capacity of 950 cfs and transports water from the Navajo River, under the

Continental Divide to Azotea Creek in the Rio Grande Basin.

Minimum bypass requirements were established in PL 87-483 8(f). This provides monthly minimum amounts of water, as defined in acre-feet, to be left in the Rio Blanco, Little Navajo River, and Navajo River. The amount of water diverted into Heron Reservoir is a function of water availability on each of these three tributaries to the Colorado River. While there are upper limits to the amount of water that can be diverted into Heron Reservoir, sometimes the limiting factor to these diversions is the amount of water that must be left, or bypassed, in each of these three water courses.

SJ/C annual diversions legislated limits include a total diversion ten-year moving average that cannot exceed 1,350,000 ac-ft, and diversions per year cannot exceed a maximum of 270,000 ac-ft. The majority of project diversions occur during April, May, and June, which coincide with spring runoff.

Heron Dam and Reservoir

From the Azotea tunnel outfall on Willow Creek, this water flows downstream to Heron Reservoir, which is the primary regulating and storage reservoir for the project. Heron Dam is located on Willow Creek just upstream of the confluence with the Rio Chama. The dam is an earth fill structure, 269 feet high, which forms a reservoir with a conservation capacity of 401,320 ac-ft, and a surface area of 5,950 acres. The spillway has a capacity of 660 cfs, and the outlet works has a capacity of 4,160 cfs. The operation and maintenance of the facility are performed by Reclamation.

Heron Reservoir is operated in compliance with the Rio Grande Compact. There are no provisions for storage of Rio Grande water, also referred to as natural or native water, in Heron Reservoir. Flows from Willow Creek that are not SJ/C or transmountain water, and inflows to the reservoir from the Rio Chama upstream of the dam, as measured at La Puente, are bypassed through the reservoir. SJ/C water must have a downstream destination, and is beneficially and consumptively used in New Mexico. Reclamation will not contract for more than the firm yield of 96,200 ac-ft.

Two basic principles control the water released from Heron Reservoir. The first concerns depletions to the river from groundwater pumping. These depletions are offset by releases of SJ/C water from Heron Reservoir. The New Mexico Interstate Stream Commission determines the amount of water needed to be released to offset these depletions, and recommends when to make the release.

Releases are then coordinated through the SJ/C contractors for release of this offset water. Secondly, SJ/C project water is delivered to contractors downstream of Otowi. Some of these releases include project water delivered to the City of Albuquerque to maintain a 50,000 ac-ft permanent recreation pool in Elephant Butte Reservoir, and the City's agreement with the Interstate Stream Commission for up to 5,500 ac-ft, with an option for 1,500 ac-ft, to maintain the sediment pool at Jemez Canyon Reservoir, (the Jemez exchange contract expires in the year 2000), and the Middle Rio Grande Conservancy District (MRGCD) for supplemental irrigation water. SJ/C water is also released to maintain a 1,200 surface acre permanent pool for recreation and fish and wildlife purposes at Cochiti Reservoir, 5,000 ac-ft is delivered to Cochiti to offset evaporative losses associated with maintenance of this pool.

Under the contracts, there is no carry-over provision for SJ/C project water in Heron Reservoir. Contractors must take delivery of their water from Heron by December 31. The no carry-over requirement often results in contractors seeking storage for their unused water in reservoirs downstream of Heron. El Vado, Abiquiu, Jemez Canyon (by exchange), and Elephant Butte Reservoirs have all been used for storage of SJ/C project water.

El Vado Dam Outlet Work Modification

Construction of El Vado Dam and Reservoir was completed in 1935. It was originally constructed to provide conservation storage (currently 186,250 ac-ft) for MRGCD to provide water for irrigation. The operation and maintenance of the facility are performed by Reclamation, under an agreement with MRGCD.

Native Rio Grande water stored in El Vado is subject to the terms of the Rio Grande Compact. The two main compact restrictions on native

water in El Vado are that Rio Grande water cannot be stored when Elephant Butte usable water is less than 400 ac-ft, and Rio Grande water will be held in storage to the extent of New Mexico's accrued debit. There is storage provided at El Vado for Indian Prior and Paramount water rights. The Rio Chama diverters have senior direct flow rights, which are bypassed through the dam.

Water imported into the Rio Grande namely SJ/C project water can be stored in El Vado but is not subject to provisions of the Rio Grande Compact. As part of the SJ/C Project, the outlet works at El Vado Dam were enlarged so that Project releases from Heron Reservoir could pass unimpeded through the dam. The outlet works capacity was enlarged to pass 6,600 cfs. Construction on the modification began in 1965 and was completed in 1966.

Nambe Falls Dam, Pojoaque Unit

The Pojoaque Tributary Unit provides 1,030 ac-ft of supplemental water for approximately 2,768 acres of irrigated land. The storage feature for the Unit is Nambe Falls Dam and Reservoir located on the Rio Nambe. The dam is a concrete and earth embankment structure 150 feet high, which forms a reservoir with a capacity of 2,020 ac-ft. Construction of Nambe Falls Dam began in June 1974 and the dam was completed June 1976. Reclamation is responsible for operation and maintenance of Nambe Falls Dam, however, this function is performed by the Pojoaque Valley Irrigation District under an agreement with Reclamation.

The water stored in Nambe Falls Reservoir is natural to the Rio Grande Basin, but the reservoir is operated as if it were SJ/C water. SJ/C Project water is released from Heron Reservoir to offset depletions of natural water as a result of reservoir operations at Nambe Falls Dam. With this operation objective, the flows at the Otowi river gage are not impacted by the Unit.

Nambe Falls Reservoir fills and spills every year usually in the spring. The distribution of project water is shared among the Indian Pueblos of Nambe, Pojoaque and San Ildefonso who jointly get 33.92%, and the non-Indian users served by Pojoaque Valley Irrigation District, who receive 66.08%.

San Juan /Chama Project Allocation of Water Supply for a Total Firm Yield of 96,200 ac-ft (category of use shown in parentheses)

48,200 ac-ft	City of Albuquerque, (M&I)
20,900 ac-ft	MRGCD, (irrigation)
6,500 ac-ft	Jicarilla Apache Tribe (M&I)
5,605 ac-ft	City of Santa Fe, (M&I)
5,000 ac-ft	Cochiti Reservoir Recreation Pool, (recreation)
1,200 ac-ft	Los Alamos County, (M&I)
1,030 ac-ft	Pojoaque Valley Irrigation District, (irrigation)
1,000 ac-ft	City of Espanola, (M&I)
500 ac-ft	City of Belen, (M&I)
400 ac-ft	Town of Taos, (M&I)
400 ac-ft	Village of Los Lunas, (M&I)
400 ac-ft	Town of Bernalillo, (M&I)
60 ac-ft	Village of Red River, (M&I)
15 ac-ft	Twining Water and Sanitation District, (M&I)
4,990 ac-ft	Contracts under consideration with:
2,000 ac-ft	San Juan Pueblo
2,990 ac-ft	Taos Area

Possible Impacts from Future Changes to SJ/C Water Operations

These impacts arise from changes in water operations due to water users developing diversions for taking delivery of their water for municipal and industrial uses. In the past these SJ/C water contractors have entered into third party contracts for delivery and use of SJ/C water. Most of these contracts are expiring soon, which will change how SJ/C water is moved through the system. Following is a summary of some of these possible changes. The intent of the author is to list the possible changes, but keep in mind that the impact of these changes has not been fully analyzed. Some changes may enhance and some may reduce the amounts of actual wet water in the river. Both quantity and timing of releases are also critical to overall water management in the basin.

Releases to Enhance Rafting and Fish between El Vado and Abiquiu Reservoirs

In 1988, PL 100-633 was passed to designate approximately 4.6 miles of the Rio Chama between El Vado and Abiquiu as a Wild and

Scenic River. After this designation, a group of people came together to identify management strategies and developed the Rio Chama Instream Flow Assessment. One strategy adopted was to manage the timing and magnitude of SJ/C releases to provide instream benefits for the Rio Chama. Effective and efficient management of deliveries of project water provides conjunctive benefits for fisheries and recreation. During the non-irrigation season deliveries downstream of El Vado Dam enhance winter brown trout spawning, and fish habitat in general. In addition, for an eight-week period each summer, movements of large flows on weekends and lower flows during the week from El Vado to Abiquiu Reservoir provide enhanced boating and rafting experiences through the designated Wild and Scenic reach of the Rio Chama. This flexibility in water deliveries is made possible by an agreement between the City of Albuquerque and MRGCD, where water is borrowed from the City pool at Abiquiu, and paid back to MRGCD pool in El Vado with deliveries from Heron.

First, releases from El Vado support rafting. These releases are often available during spring runoff with native flows, and from mid-July to the end of August with a borrow-payback scheme between the City of Albuquerque and MRGCD with SJ/C water. In April, May, and June, MRGCD uses native water in the main stem of the Rio Grande, and borrows SJ/C water from the City pool in Abiquiu Reservoir to meet irrigation demands in the middle valley. The water borrowed from Abiquiu is returned by MRGCD from El Vado Reservoir on weekends to help provide flows to enhance rafting.

Second, releases from El Vado provide fishery flows from the end of October through March. These releases are made possible through the movement of SJ/C water from Heron and El Vado to make various deliveries during the winter months. Recommended flows range from 150 to 400 cfs. Once the release is set for the winter, it is maintained from the beginning of October through the end of March. This provides a steady-flow condition that enhances fish reproduction, and early development.

Jemez Reservoir Sediment Pool

A sediment control pool at Jemez Reservoir, a Corps of Engineers facility, is maintained by the

New Mexico Interstate Stream Commission to enhance the sediment-trap efficiency of the reservoir. This pool is maintained by exchanging SJ/C water to replace evaporation, and is usually topped off once a year. The ISC has been leasing 5,500 ac-ft of SJ/C water, with an additional option of 1,500 ac-ft, from the City of Albuquerque SJ/C for this purpose. This agreement expires in 2000.

Elephant Butte Recreation Pool

Under agreement between the City of Albuquerque and the New Mexico Department of Natural Resources, up to 50,000 ac-ft is available to maintain the recreation pool in Elephant Butte Reservoir through the year 2010. City of Albuquerque has an additional storage agreement to store up to 50,000 ac-ft of their SJ/C to maintain the federal recreation pool in Elephant Butte.

Power Generation

Los Alamos County has an annual allocation of 1,200 ac-ft of SJ/C water. This allocation was originally obtained by the Department of Energy, but in 1998 these rights were transferred to the County. Los Alamos County has two power generation plants, one located at the outfall of El Vado Reservoir, with a capacity of 8 megawatts, and the other located at the outfall of Abiquiu Reservoir, with a capacity of 12.6 megawatts. Both can handle 900 cfs, while the minimum amount of water needed for power generation is approximately 140 to 200 cfs. Both generators are operated from run of the river and do not impound, restrict flow, or use SJ/C directly for power generation. However, the SJ/C borrowing and payback scheme currently going on greatly enhances the County's ability to generate power.

MRGCD Minimum Flow Agreement with the City of Albuquerque

This agreement expires at the end of 2000, and has provided a minimum flow of 250 cfs at Central Street Bridge during the irrigation season. This agreement was made prior to the City's Southside Water Reclamation Plant upgrade to improve water quality. The purpose for providing a minimum flow was to furnish water for dilution of the treatment plant effluent to meet water quality permit requirements. Currently the City provides MRGCD with 20,000 ac-ft of SJ/C water to maintain these flows.

Reservoir Fluctuations

With the development of both the City of Santa Fe and the City of Albuquerque water diversion projects putting their SJ/C water to municipal and industrial (M&I) use, there will be greater reservoir fluctuations at Heron, El Vado and Abiquiu.

actual amount released for Indian needs varies and is normally much less than the amount stored for the Indians. The release of Indian water is predicated on the prior and paramount water right land needs without constraint of the Rio Grande Compact.

Endangered Species Operations, Supplemental Water Contracts

Many SJ/C contractors are leasing the use of their water to Reclamation which in turn, gives it to MRGCD to use for irrigation. MRGCD then allows their native water to flow in the river to support the Rio Grande silvery minnow. The two largest contractors for this supplemental water have been the cities of Santa Fe and Albuquerque. When the cities start taking delivery of their SJ/C water for municipal and industrial use, there will be less water for Reclamation to contract for to support silvery minnow flows.

Rio Chama Acequias

Rio Chama Acequia Association has senior native water rights on the Rio Chama. The New Mexico Interstate Stream Commission administers these water rights. El Vado may not operate to the detriment of the senior water right holders below Abiquiu Dam whose rights have a total diversion requirement of 140 cfs. Natural flow is bypassed under these conditions and Rio Grande storage in El Vado is reduced. Releases from Abiquiu Reservoir have been averaging approximately 75 to 100 cfs of native water daily during the irrigation season.

El Vado Storage of Native American Prior and Paramount Water

There are storage rights at El Vado Reservoir for Six Southern Indian Pueblos of the Middle Rio Grande: the Pueblos of Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, and Isleta. Storage and release of Rio Grande water for these Indian Pueblos are not subject to the terms of the Rio Grande Compact. While the upper limit of Pueblo needs is reasonably predictable and controls the determination of storage, the

**Summary of Authorizations and Legislation Impacting or Associated with
the San Juan/Chama Project**

- 1908 *Winters Doctrine* decision is important for SJ/C Project approval; no State enforcement on Indian Reservations.
- 1928 Colorado River Compact is ratified, establishing allowable depletions for the Upper Colorado River Basin states.
- 1928 Indian Pueblo prior and paramount rights provides for a series of later statutes and operation and maintenance on reclaimed acreage and extends the agreement for delivery of prior and paramount rights in the operation of the MRGCD.
- 1933-34 Bunger Survey identifies SJ/C as a viable means of delivering water to Albuquerque.
- 1939 Rio Grande Compact, establishes compact delivery obligations for Colorado, New Mexico and Texas, and recognizes transmountain diversions.
- 1946 Reclamation performs a study that establishes New Mexico's Upper Colorado River Basin water right at 800,000 ac-ft.
- 1949 Upper Colorado River Basin Compact is ratified, setting New Mexico's share of Upper Colorado river water to 11.25%.
- 1950 Secretary of Interior asks San Juan Technical Committee to find ways for New Mexico to use its Upper Colorado River Basin allotment.
- 1956 Colorado River Storage Act, provides for a non-power generating storage facility on the Rio Chama.
- 1962 PL 87-483, Navajo Indian Irrigation Project (NIIP), and SJ/C Project are authorized jointly, limiting diversions for the SJ/C to 110,000 ac-ft, down from the original 235,000 ac-ft. Project water uses were identified for municipal, domestic, industrial, recreation and fish and wildlife. The Navajo Council agreed to both projects, reducing their claims in exchange for NIIP. One big unknown for future water management is how water shortages will be shared.
- 1964 PL 88-293 establishes a permanent pool in Cochiti Reservoir for recreation, fish and wildlife purposes.
- 1974 PL 93-493 authorizes Elephant Butte Recreation Pool, (Jicarilla Apaches file suit after BOR contracts for storage of SJ/C at Elephant Butte. Albuquerque is prohibited from storing SJ/C).
- 1981 New authorization allows the Secretary of Interior to contract with others to store their SJ/C water in Elephant Butte and Abiquiu reservoirs.
- 1981 PL 97-140 provides authorization for storage of SJ/C water in Abiquiu (200,000 ac-ft), and Elephant Butte reservoirs.
- 1988 PL 100-522 provides authorization for storage of Rio Grande (200,000 ac-ft) water in lieu of SJ/C water in Abiquiu.

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