

Pima-Maricopa Irrigation Project

Education Initiative
2002-2003



Restoring water to ensure the continuity of the Akimel O'otham and Pee Posh tradition of agriculture

Keeping Alive the Hopes of the San Carlos Project

Part 23

When Interior Secretary Ethan Allen Hitchcock selected the Salt River (Tonto) site as the first federal reclamation project in Arizona, in 1903, hopes for a similar project in the Gila River Valley appeared dim. The Territorial Legislature, which in 1896 had petitioned Congress to build a dam at the Buttes to “preserve [the Pimas] from further want and degradation,” was no where to be found when the Pimas faced the depths of deprivation in 1900. Nonetheless, plans for a reclamation project to benefit Pima and non-Indian farmers in the Gila River Valley proceeded, with the San Carlos site the center of attention.

The first discussion of the San Carlos site was in 1899 when Joseph Lippincott of the US Geological Survey (USGS) recommended that the “San Carlos dam should be built as the first step to be taken for the storage of water upon the Gila.” A year later, consulting engineer James Schuyler reviewed the Lippincott report and concurred with the San Carlos site.

In February of 1903, the Reclamation Service sent Charles Real Olberg to San Carlos to oversee the evaluation of the bedrock foundation, upon which the proposed dam would rest. Fifteen holes were bored into the bedrock, with the conclusion that the location was by no “means insuperable.” The Reclamation Service noted two other potential problems: too much silt (and no plan as yet to sluice it through the dam) and, “still more serious,” whether or not there was an adequate supply of water. Since earlier water measurements had been taken here had been a continuing decline in the quantity of water flowing at the San Carlos site. In 1902, less than 100,000 acre feet of water flowed through San Carlos, demonstrating two important facts: 1) drought continued to grip Arizona; and 2) the upper valley users were “complete[ly] diver[ting] (the) Gila waters in the neighborhood of Solomonville, in Graham County.” The Reclamation Service concluded that a “higher dam and a larger reservoir than heretofore contemplated” would be needed and that it would “not be possible to irrigate from this reservoir as large an area of land as heretofore contemplated.”

It was nearly three years before the Reclamation Service again reported on the San Carlos site. On December 7, 1905, Frederick Newell, Chief Engineer of the Reclamation Service, recommended that the San Carlos site be abandoned. The primary consideration was silt. Newell estimated the dam would have to be 180 feet high to maintain a capacity of 300,000 acre-feet of water for a period of 60 years. It was not, Newell concluded, “financially feasible to construct canals around the reservoir for flushing purposes.” Observations on the upper tributaries of the Gila River, above San Carlos, led Newell to suggest a smaller project capable of supplying water to 40,000 acres of land down stream. The only potential sites on the upper Gila River were the Guthrie site (255,800 acre-feet capacity) and the Red Rock site (80,000 acre-feet capacity). On the San Francisco River, the Alma site (135,000 acre-feet) was the only viable location. All of these were inferior to the San Carlos site, the main purpose of which remained to supply “stored water to the Pima Indians or to private lands near Florence and Casa Grande.”

In 1906, the Arizona Eastern Railroad (a subsidiary of the Southern Pacific Railway) was granted a right-of-way through the San Carlos site. When the right-of-way expired, in 1909, without a road being constructed, Arizona Eastern renewed its application. At the same time, the San Carlos picture grew more complicated when Julius M. Jamison applied for the right to construct a dam and reservoir at the San Carlos site. The Casa Grande Water Users’ Association and the Gila River Water Company also filed applications on the San Carlos site.

Central Arizona cities, towns and, in some cases, individuals, flooded the Interior Department with letters opposing all railroad applications. The construction of a railroad through San Carlos canyon would “practically destroy the future use of this site for irrigation.” On February 17, 1912, Assistant Secretary of the Interior Samuel Adams rejected without prejudice all of the applicants.

The Southern Pacific Railway sought to dissuade the secretary by arguing that its proposed “short transcontinental line” would provide shippers with lower rates and, “through the construction of branch lines, [would] supply the Salt River Valley, now irrigable under the Roosevelt Dam ... with cheap transportation facilities, cheap fuel, and easy outlet for crops, minerals and other commodities.” Schuyler argued that it would be an injustice “in perpetuity to the present population and future inhabitants of the Gila River Valley” if the railroad was granted the right-of-way at San Carlos.

In reaching his decision, Adams acknowledged there was sufficient water in the Gila to warrant a reservoir if “a suitable foundation is present for the construction of a high dam ... and if a method of disposing of the silt carried in the water can be worked out.” The railroad, Adams added, could still build its line further up in the canyon, but it would not be allowed to “destroy the possibilities incident to the irrigation of the arid lands in the valley, including Indian lands.”

The Geological Survey continued to evaluate not only the physical location of the proposed reservoir but also the maximum acreage that could likely be served by a potential project. M. O. Leighton, chief hydrographer of the USGS, reviewed this question in 1909. Issuing his report in February 1910, Leighton concluded the “factor which determines the feasibility or non-feasibility of an irrigation project is not the abundant but the scarce years of water supply.” Therefore, “the project should not be planned on the basis of a greater actually cultivated acreage than the equivalent of the average of the five dry years” between 1900 and 1904. Any acreage beyond this would risk inadequate water. The average water use between 1900 and 1904 was 140,200 acre-feet, enough for just 32,200 to 43,000 acres of land, depending on coverage. Engineer F.E. Herrmann cautiously concluded the actual safe yield of water was but 166,000 acre-feet, enough for just 24,000 acres of land (assuming 4 acre-feet per acre at the field and 7.5 acre-feet released from the dam, the difference being lost in transit).

Engineer J.H. Quinton assumed 260,000 acre-feet could be stored with a 25% loss, leaving water for no more than 65,000 acres of land (later revised to 46,000 acres). In 1912, Quinton further refined his estimate to a maximum of 50,000 acres, with 17,000 acres set aside for the Pimas. The Pimas should receive one-third of the water, Quinton reasoned, because “there is known to be a copious supply of underground water” on the reservation.

Schuyler and H. Hawgood refuted Leighton’s assertion that the low water years should be the main factor in determining feasibility. Using this reasoning few of the California irrigation projects would “be considered as successful and safe irrigation projects.” In dry years, when storage water was low, groundwater pumping could supplement the reservoir supply.

William Rosecrans reported in 1912 that the original 1899 San Carlos site was not feasible due to the depth of bedrock (too deep), the presence of a geologic fault line, and the inclined rock strata, all of which weakened any potential dam. He estimated that San Carlos could safely store a maximum of 260,000 acre-feet of water and that this supply would be available nine of every ten years. He further estimated a maximum of 62,000 acres being served from the reservoir, with the Pimas receiving 90,000 acre-feet of stored water, enough for 21,500 acres of land. Rosecrans also evaluated existing irrigation works on the reservation and concluded that the Sacaton Project, which utilized groundwater and floodwater, could irrigate 12,000 acres, bringing the total irrigated lands to 33,500 acres.

In December of 1911, Schuyler commented on the newly created Pinal Mutual Irrigation Company of Florence. Pinal Mutual was incorporated in March of 1911 with the intent of building a new canal to deliver water to its members’ lands near Florence (due to the financial and physical failure of the old Florence Canal Company). Pinal Mutual planned to head a new canal above the old Florence Canal on the Gila River (near the present location of the Ashurst-Hayden Diversion Dam)

and then build it out and parallel to the old Florence Canal for twenty miles. It did not wish to ignore federal involvement, but decided it was no longer going to wait for federal action.

Schuyler projected the canal could convey its maximum of 108,000 acre-feet of water seven years out of ten. This would be enough water to irrigate between 12,000 and 25,000 acres of land. “While such flush seasons may often occur, the years when the river is low or nearly dry during April, May, and June are of such frequent occurrence” as to limit irrigation operations and force farmers “to confine their crops to grain alone rather than to ... the growing of alfalfa, which a constant supply of water would permit.” Grain crops planted in late fall or early winter would not be affected by this shortage of water if they were irrigated before the dry out set in. An auxiliary supply of water could be secured via the sinking of twenty 15 inch wells. As a precaution, Schuyler recommended a “storage reservoir on the upper Gila or the San Francisco River [as] a cheaper means of securing an auxiliary supply of water.”

By 1912, the verdict was far from settled. A variety of studies had determined that a storage facility at San Carlos—despite a variety of potential problems—was feasible. While political posturing continued (the Reclamation Service remained opposed to the San Carlos site), the idea of a reservoir on the Gila River persisted. It continued to be viewed as the primary means by which to get water to the Pima Reservation and to non-Indian farmers in the Florence-Casa Grande area. When Congress appropriated money to conduct an overall feasibility study of the San Carlos site in 1912, it did not turn to the Reclamation Service. In September 1912, the Army Corp of Engineers was directed to conduct the study. The fate of the San Carlos project rested in their hands.

Teacher Plan for “Keeping Alive the Hopes of the San Carlos Project”

Terms to know and understand

- Bedrock
- Insuperable
- Silt
- Tributaries
- Geologic Fault

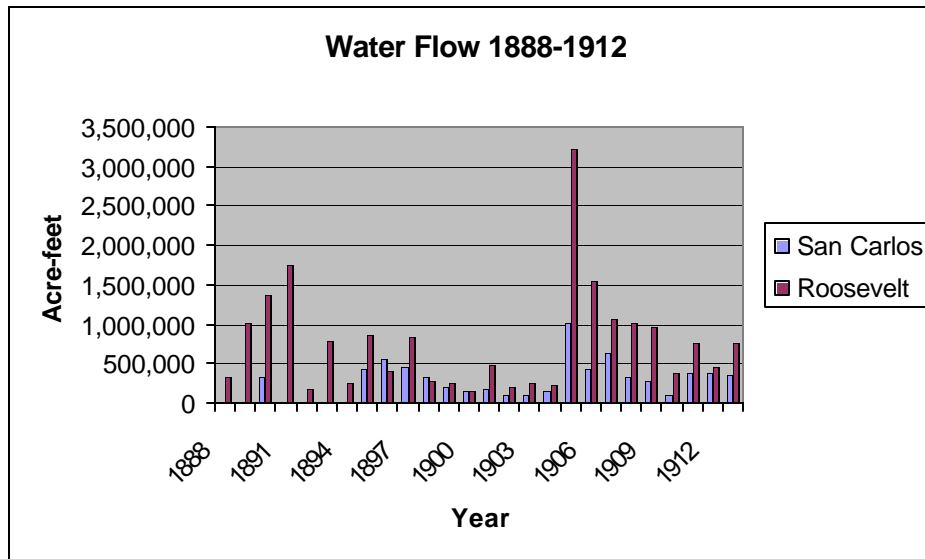
Critical Thinking:

- Have students examine the chart below. Based on the data given, which reservoir (Roosevelt or San Carlos) had the greatest volume of water? Why would this data be important if one were planning a storage reservoir such as that contemplated at the San Carlos site?

Students will be able to:

1. Describe the basic nature of the hydrologic surveys of San Carlos between 1899 and 1912.
2. Read and draw conclusions from the graph documenting water flow between 1888-1912.

Objectives



Activities

- Using the information gathered from the chart above, have students draw some conclusions as to which water storage site appeared the better of the two sites overall. If you looked only at the data from 1896 to 1900, which dam might you conclude was the better of the two (in terms of storage capacity)?

About P-MIP

The Pima-Maricopa Irrigation Project is authorized by the Gila River Indian Community to construct all irrigation systems for the Community. When fully completed, P-MIP will provide irrigation for up to 146,330 acres of farmland. P-MIP is dedicated to three long-range goals:

- Restoring water to the Akimel O’otham and Pee Posh.
- Putting Akimel O’otham and Pee Posh rights to the use of water to beneficial use.
- Demonstrating and exercising sound management to ensure continuity of the Community’s traditional economy of agriculture.