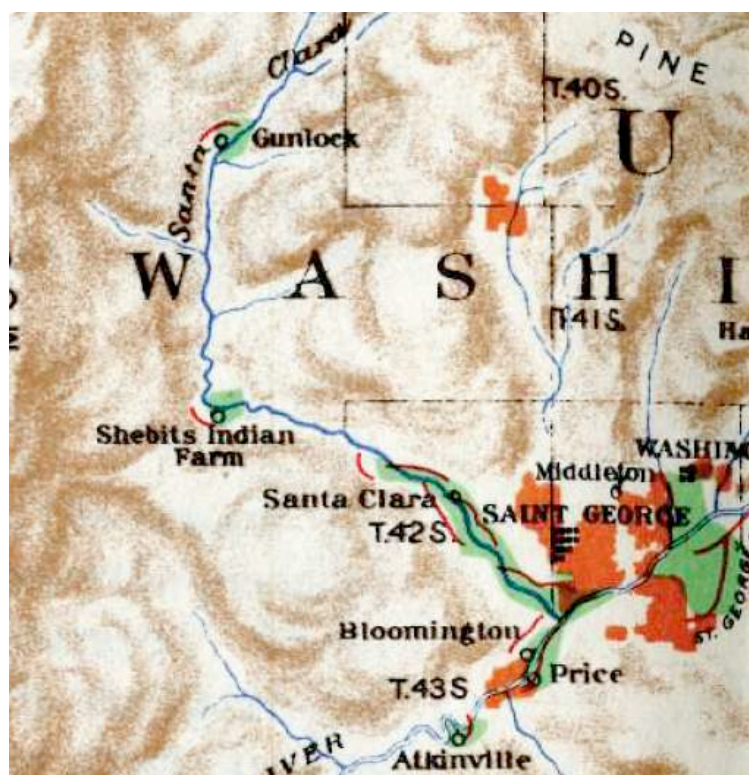
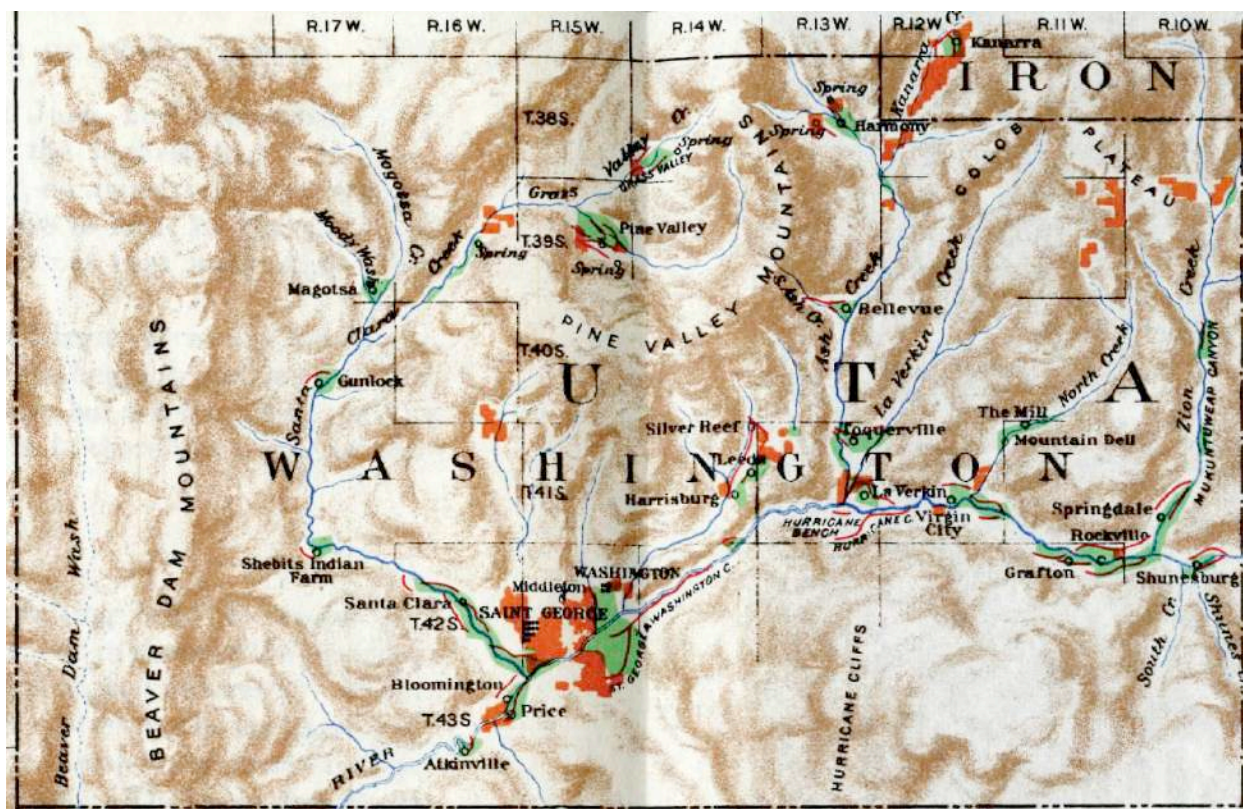
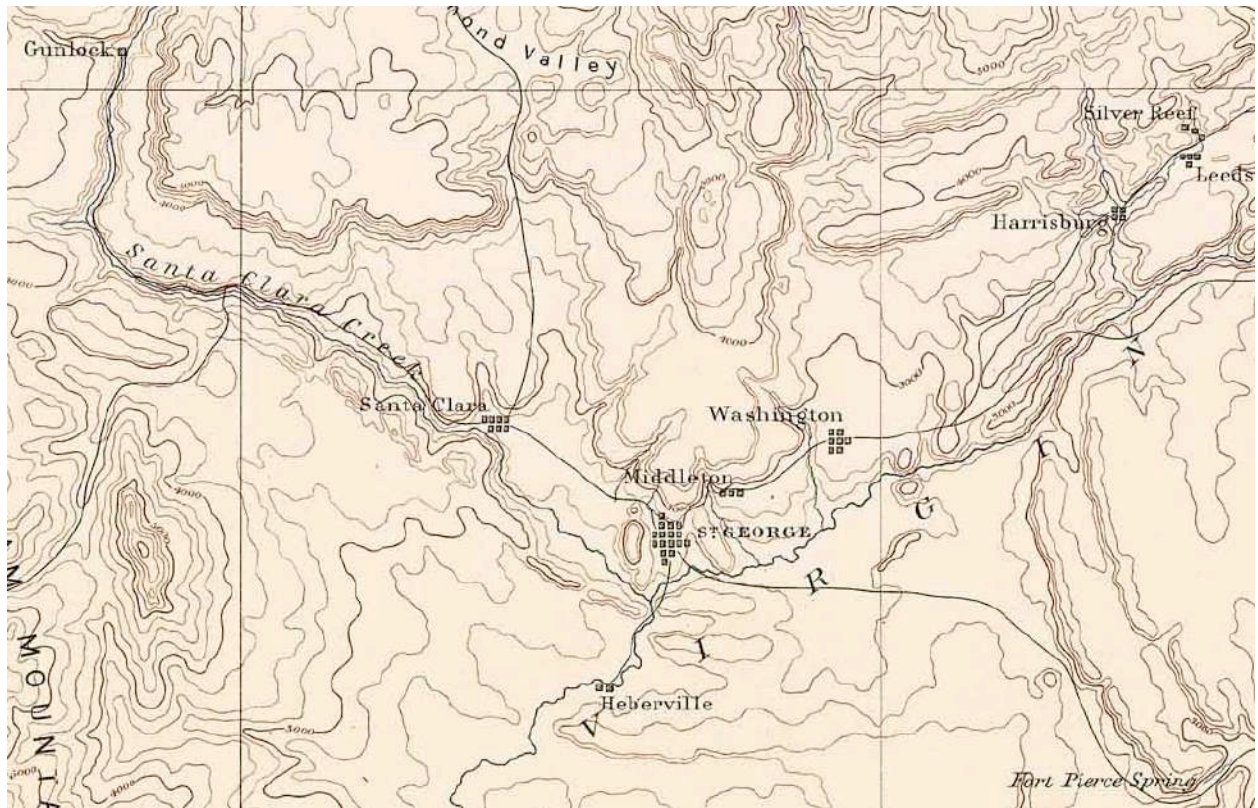


Shivwitz Reservation, Shem Smelter, Santa Clara Bench Canal, and Winsor Dam
Richard Kohler 2014

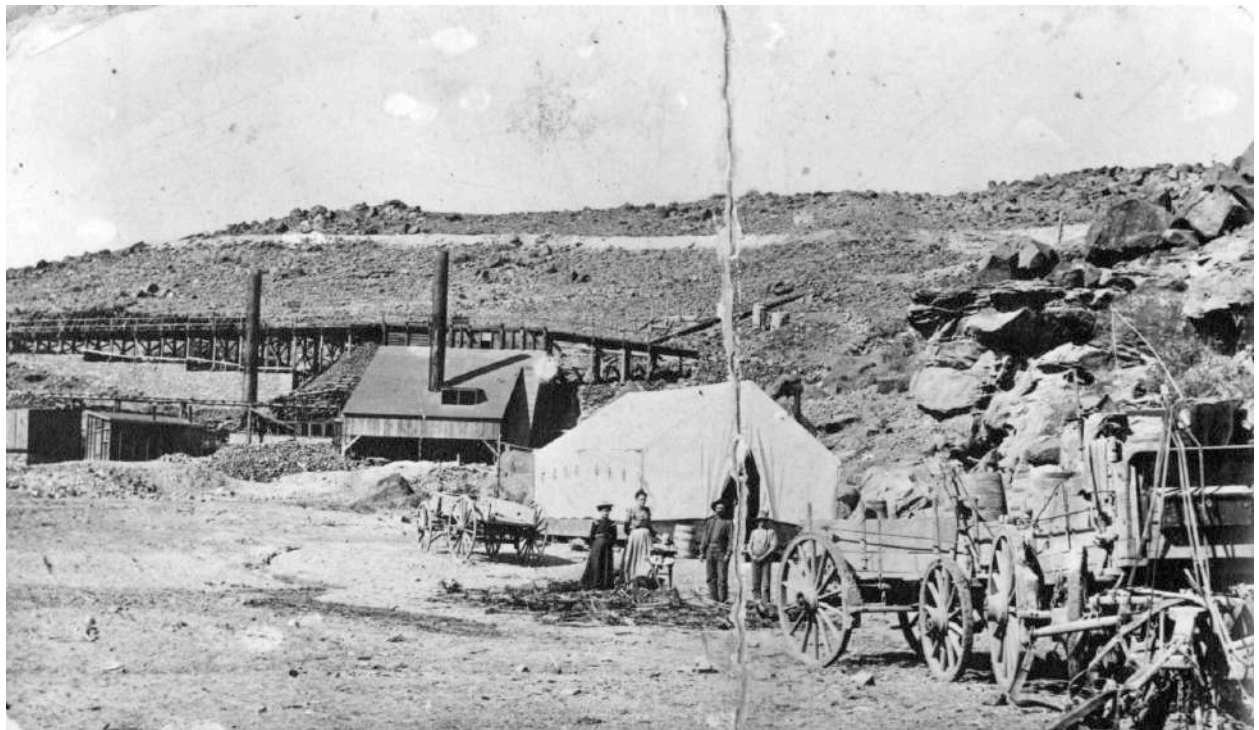


1902 Irrigated Washington County,
Elwood Mead

Shivwitz Reservation, Shem Smelter, Santa Clara Bench Canal, and Winsor Dam
Richard Kohler 2014



1891 St. George, United States Geological Survey Map, John Wesley Powell



1902 Shem Smelter, Utah and Eastern Copper Company



1900 Dixie (Apex) Copper Mine

THE DIXIE SMELTER.

James Andrews, who is connected with the Woolley, Lund & Judd Copper Mining Company of St. George, is in the city. He says that the smelter that the company erected last summer and run for a while will be started up again in a short time. They have over two hundred tons of ore at the smelter and about as much at the mine and twelve men are employed in taking out ore. The smelter is eighteen miles distant from the mine and a large number of teams are engaged in hauling ore from the mine to the smelter.

The company work ore in the smelter that runs twenty-five per cent copper while they ship their first-class ore. The first-class ore carries fifty per cent copper.

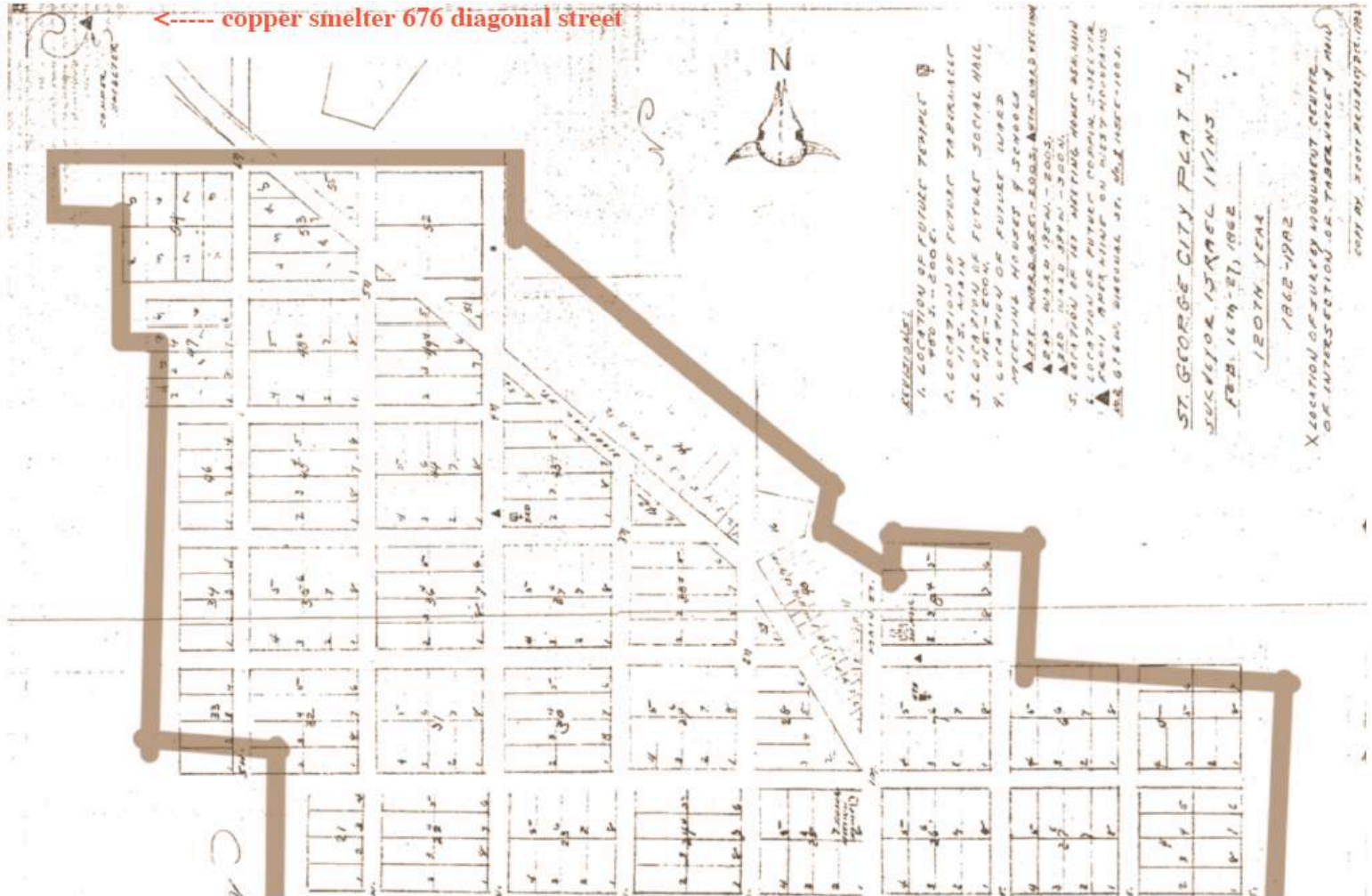
1892 Salt Lake Tribune



1875 John Wesley Powell and Paiute Indians



1875 D. D. McArthur with A. P. Hardy Baptizing Shivwits Indians, Charles Savage



reported that years ago the Dixie, then known as the Pen mine, produced 300 tons of copper ore which was shipped to outside smelters; but no record of the output remains, nor is it taken into the estimates of copper production. In 1891 a shipment of 13 tons to Milford, the nearest railway point at that time, cost \$30 per ton for freight, but the ore was very rich, containing 54.2 per cent of copper, 4.1 per cent of sulphur, 5.7 per cent of iron, 2.6 per cent of silica, and 4 ounces of silver per ton. Besides copper, some 15 per cent lead ore containing 5 to 25 ounces of silver, was encountered at times in the Dixie mine. In 1891 a copper furnace was erected near St. George and is said to have produced 3 to 4 tons of copper bullion daily. In October, 1899, a new company was incorporated and shortly after a smelter was built at Shem. From this time blister copper was shipped until in 1906, when the plant was closed.

Mining Journal Notices, 1914

1890 Anthony Ivins, St. George Mayor
1891 Anthony Ivins Special Indian Agent

Excerpt from Life in a Utah Indian Day School
Ethel Cranston Nelson, 1904

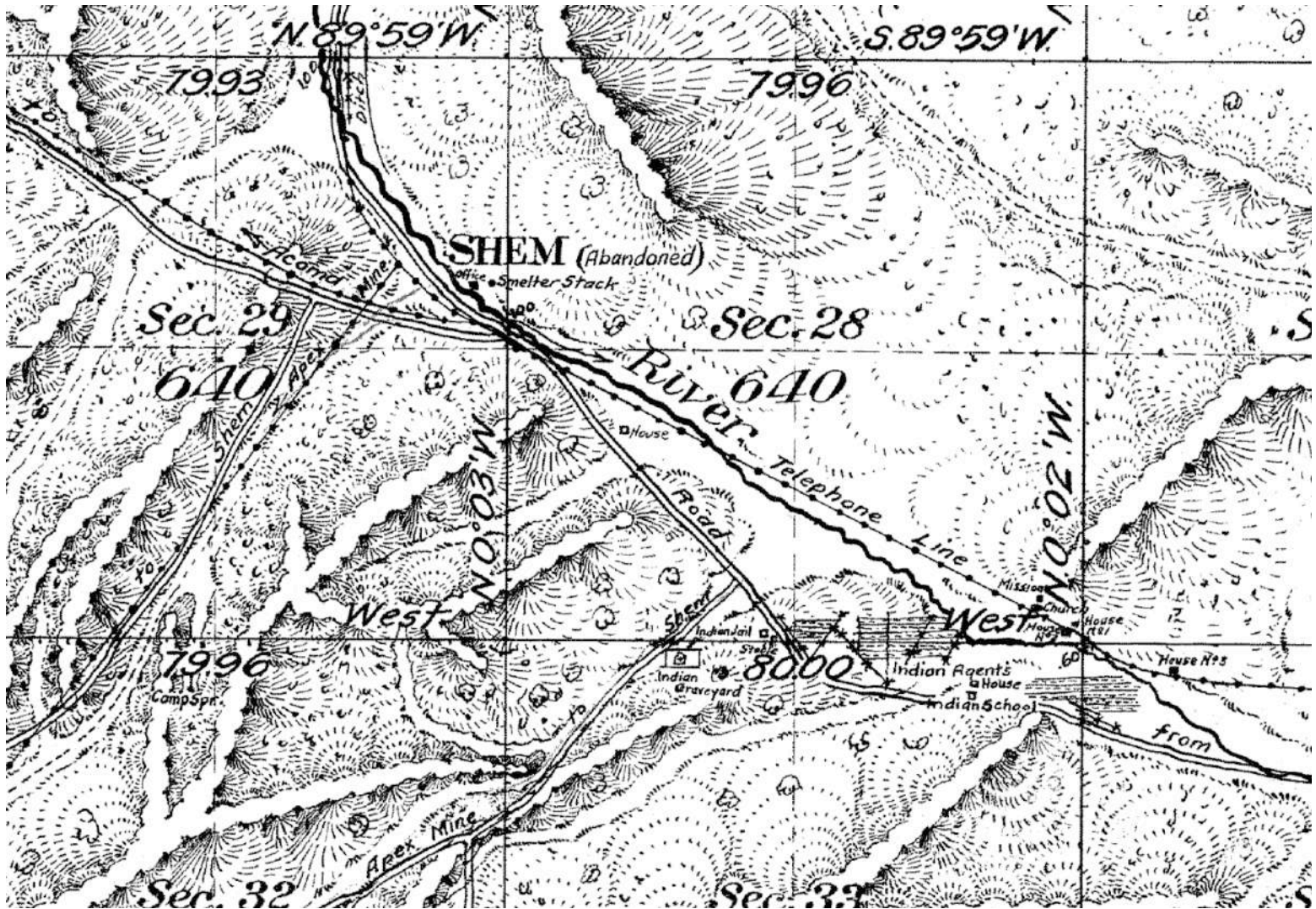


According to Shem, the chief, the Indians were very poor; but the sheepmen came and the Indians became poorer still, for the sheep ate up all vegetation and left them without food; then they became desperate and made several raids on the people of southern Utah, stealing everything they could get. The people of St. George, to protect themselves, called together the most influential Indians and offered to buy them what was known as the McNeil farm. If they would pledge themselves that no more raids should be made. The pledge was given, the farm was bought, and the Indians settled there. The government, afterwards added the Conger farm and the Woodbury place. Now each family tills its tiny farm of from three to five acres—not half enough to support any family, so the living is augmented by the squaws washing, the large boys working as cowboys, and the men doing chores and begging. If it were not for the St. George people, the Indians would starve. If the Indians were given enough land and their water rights protected, they would be entirely self-supporting, but when I was at the farm there were constant quarrels during the

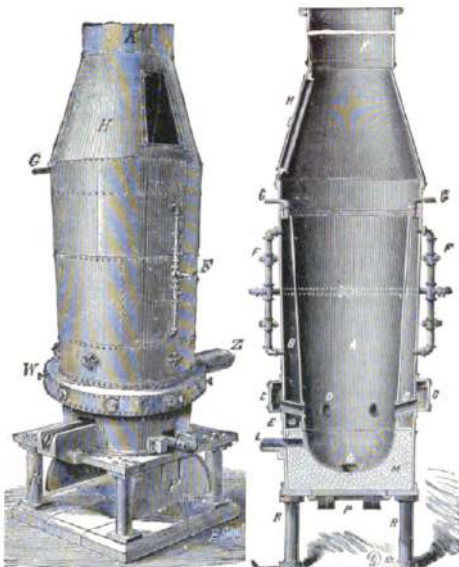
offered to buy them what was known as the McNeil farm, if they would pledge themselves that no more raids should be made

the government, afterwards added the Conger farm and the Woodbury place

if the Indians were given enough land and their water rights protected, they would be entirely self-supporting



1912 Shem (Abandoned) Geological Survey Map Detail



The company has 2 smelters, 1 worthless; the new smelter has a 100-ton water-jacket blast furnace, with water power, secured from the Santa Clara river, 2 miles distant, and a small auxiliary steam plant. The smelter is at **Shem**, about 50 miles from Acoma, on the Rio Grande Western railroad, the nearest shipping point, and transportation for 14 miles of the distance is by traction engine.

Right of Way Granted

Senator Reed Smoot has advised Secy James McArthur of the St George and Santa Clara Bench Irrigation company that the right of way over the Shivwitz Indian reservation for the company's canal has been granted. Upon receipt of this news Engineer Leo A. Snow left to run surveys and make ready for the force of men who will start work on the canal. Mr. Snow expects to be



1920 Shivwitz Indian School



1920 Shivwitz Reservation with Santa Clara Bench Canal Cut Visible on Hill Behind



AFTER THE TENT MEETING, SHEM, UTAH.

WITH THE INDIANS.

The next stopping place for our tent was at Shem where we have a little church of Shev-wit Indians. The leading member of our church there was once a Mormon bishop of the Shev-wit tribe. Many things had conspired to incline him to return to the Mormon faith:

the Mormons immediately organized the reservation into a "Ward" and appointed Chief Shem as bishop. But past experience with the Mormons had been unpleasant and the result was that the Indians ousted Shem as bishop and chief both.

Sunday Services.

At St. George Tabernacle.

Sunday, November 8th, 1896.

The Rev. Mr. G. W. Hardy of the Presbyterian Church was allowed the privilege of preaching in the Tabernacle owned by the Church of Latter-day Saints. He took for his text the words "The sabbath was made for man and not man for the sabbath." He showed that God designed that both man and beast should have this one day in seven to rest, as their nature required it, and also that man should have this one day in seven for divine worship.



Apex Mine Ore Sample

Dixie Mining Company
Stock Certificate



The Utah and Eastern Mining Company's copper smelter at Shem, Washington County, is equipped with 2 water-jacket blast furnaces, each of 50 tons capacity.



Clarence S. Jarvis
Born: St. George 1880

B. S., Brigham Young University (1904)
1901 passed entrance exam to be cadet at West Point
1901 received high school diploma and surveying certificate from
Brigham Young Academy

Teaching:
Mathematics and Science, 1901 to 1904, B. Y. Academy
Engineering, 1906 to 1909, B. Y. University

United States Reclamation Service 1906 to 1908
Provo Reservoir Irrigation Project after 1908
Santa Clara Bench Canal after 1909
Consulting Engineer Salt Lake City after 1912



Leo A. Snow
Born: St. George 1881

B.S., University of Utah, (1908)

Washington County Surveyor after 1908
Boundary Survey for Mukuntuweap National
Monument 1909
Santa Clara Bench Canal after 1909
Public Works Administration after 1939



Luther M. Winsor
Born: Hebron (Washington County) 1884

B.S., Utah Agricultural College (1911)
M.S., University of California, Berkeley (1926)

Uintah Reservation Irrigation Project after 1911
Irrigation Project in Chile after 1918
Utah Debris Control Dams after 1923
Bear River Refuge after 1928
Santa Clara Creek (Winsor) Dam after 1933
Irrigation Advisor to Iran after 1941

The Latter-day Saints Millennial Star
Monday, May 4, 1885

The farmers of St. George suffered a heavy loss of crops last year through the washing away of the dam in the Virgen river, situated about midway between that city and Washington. An extensive and substantial pile dam is now being erected on the site of the old one, at considerable cost, which it is expected will be finished so that the water can be supplied to the fields by the 1st of June, and good crops there the present season are looked for.



1892 Working on the Washington Fields Dam (1893)

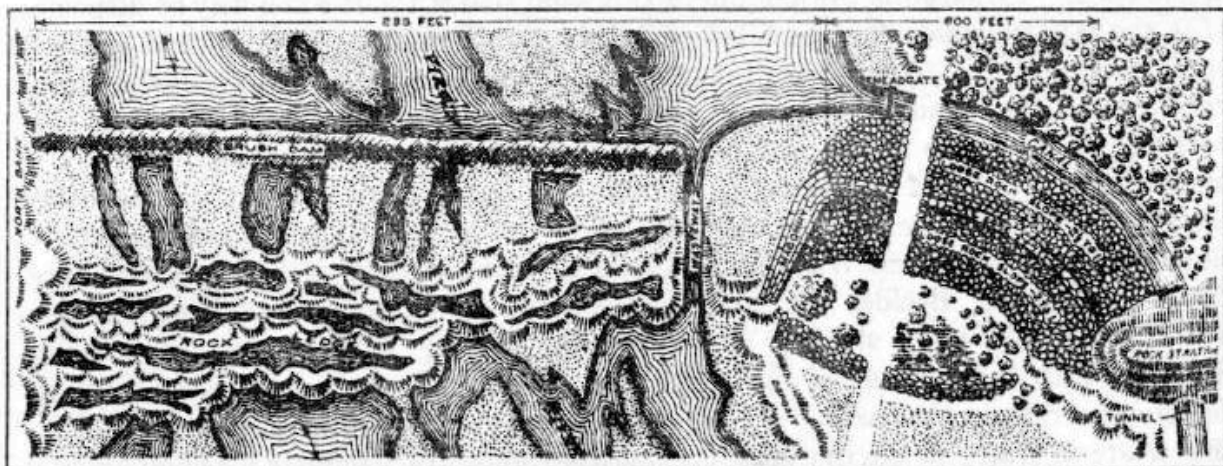


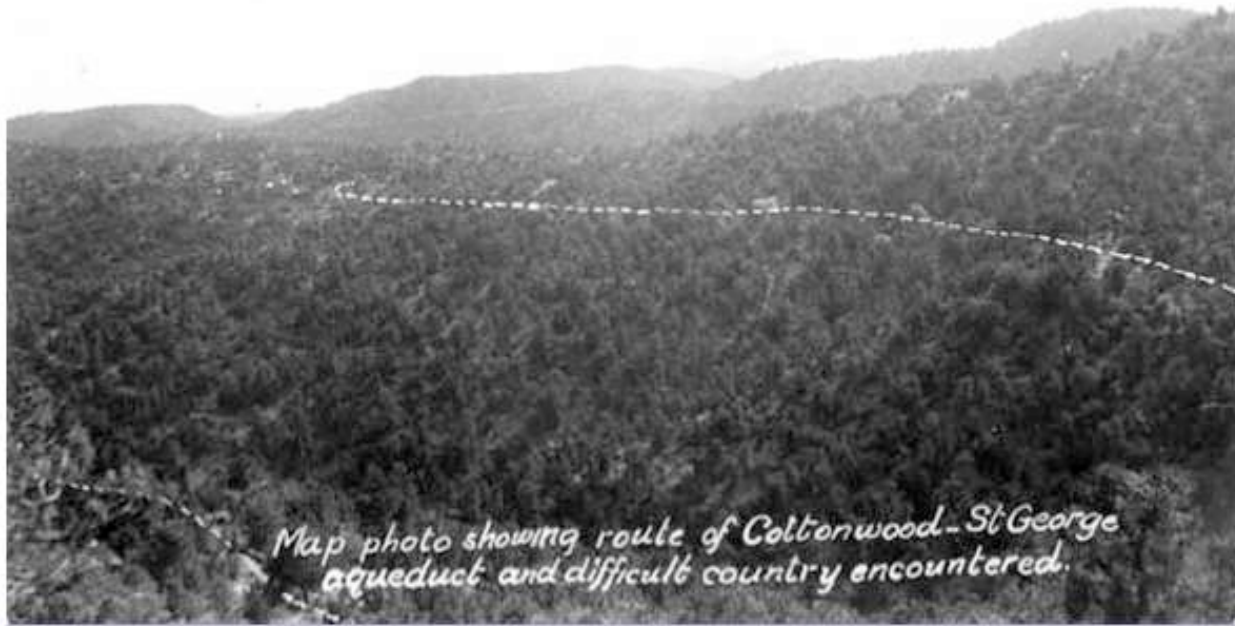
FIG. 1.—Plan of St. George and Washington Dam.



2009 Washington Fields Dam Aerial Photograph



1915 Brigham Jarvis Sr. Surveying



St. George - Cottonwood Canal (1898) Route on Photograph



1910 Enterprise Dam Completion Celebration



1912 St. George to Washington Fields Steel Bridge over Rio Virgen

NOTICE TO WATLR USERS

State Engineer's Office

Salt Lake City Utah

July 22 1912

Notice is hereby given that the Saint George and Santa Clara Bench Irrigation Company, by its secretary James McArthur whose post office address is Saint George Utah, has made application in accordance with the requirements of the Compiled Laws of Utah 1907, as amended by the Session Laws of Utah, 1909 and 1911 to appropriate twenty (20) cubic feet of water per second from Santa Clara Creek Washington County, Utah Said water will be diverted at a point which bears north 40 degrees 55 minutes west 4 334 feet distant of the south quarter corner of Section 28 Township 41 south Range 17 west, Salt Lake base and meridian, from where it will be conveyed by means of a canal for a distance of 55 000 feet and there used during the period from January 1 to December 31 inclusive of each year, to irrigate 8 360 acres of land embraced in Sections 3 to 11, inclusive 13 to 16 inclusive, 22 23 and 24 Township 42 south Range 16 west Sections

to appropriate twenty (20)
cubic feet per second

to irrigate 8360 acres of land
(as much as 5000 acre feet
of water)

INDIAN APPROPRIATION BILL.

SHIVWITZ RESERVATION, UTAH.

Indian tribe, Paiute.

Number of Indians, 113.

Area of reservation, 26,270 acres.

Area irrigable from constructed works, 70 acres.

Area actually irrigated, 70 acres.

Area farmed by Indians, 70 acres.

Area of whole project, 300 acres.

Cost of irrigation construction, \$1,155.35.

Cost of irrigation, maintenance, and miscellaneous, \$364.58.

Estimated additional cost to complete project \$2,000.

Estimated total cost of irrigation, \$11 per acre.

Average value of irrigated land, \$50 per acre.

Average annual precipitation, 12 inches.

Source of water, local streams. Market for products, local (fair). Distance from railroad, 60 miles.

Shivwitz Reservation, Utah..... \$1, 500

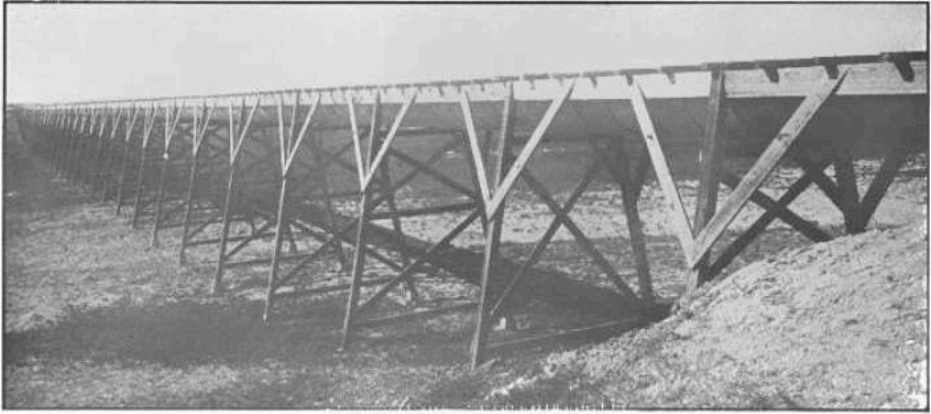
This reservation has 200 acres of land under the St. George & Santa Clara Bench Irrigation Co.'s ditch, which needs leveling and clearing. The sum requested is for payment of water rentals and for material for construction and repair of ditches.

1916 Shivwitz Reservation Appropriation Bill

For the construction of a wagon road through the Shivwits Indian Reservation, Utah, \$5,000; for the construction of a steel bridge and approaches across the Santa Clara River on the Shivwits Indian Reservation, \$10,000; in all, \$15,000, reimbursable to the United States from any funds now or hereafter placed in the Treasury to the credit of the Shivwits Tribe of Indians, to remain a charge and lien upon the lands and funds of said tribe of Indians until paid.....

1915 Shivwitz Reservation Roads Appropriation

Maginnis Galvanized Steel Flume
NO RIVETS NO SOLDER ANY SIZE ANY LENGTH



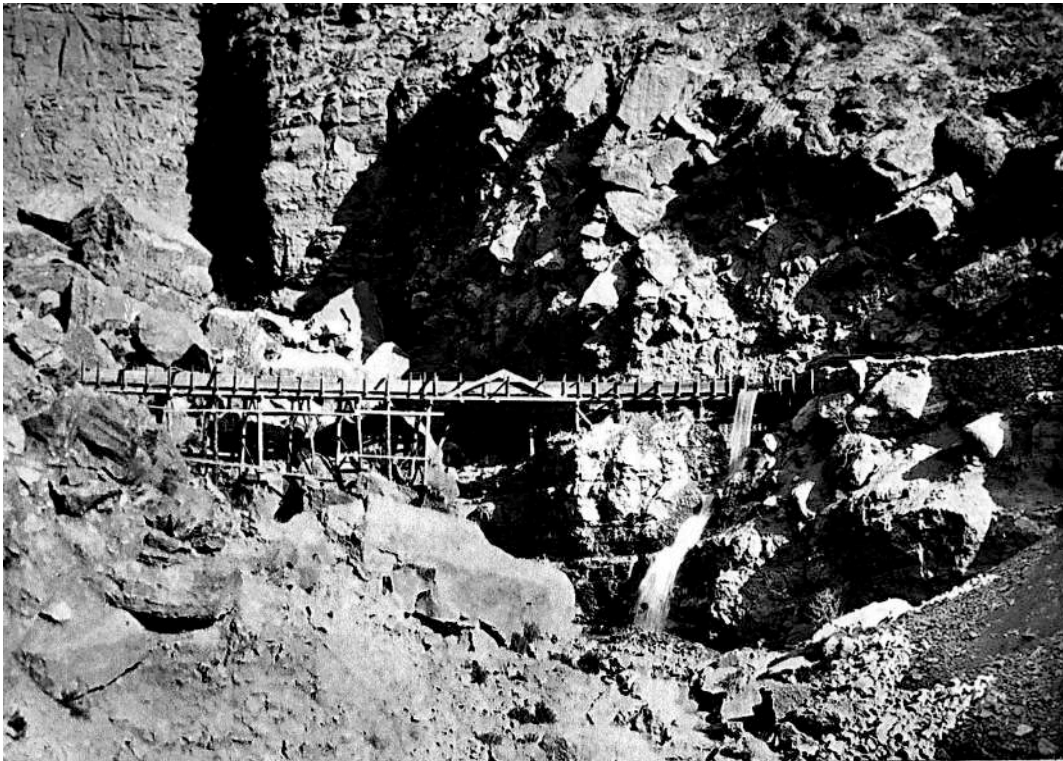
No. 96 Maginnis Steel Flume, 600 Feet Long

Don't waste your time and money repairing an old wooden flume—you can't afford it. The Maginnis Galvanized Steel Flume does not leak. It saves all of the water all of the time, and will outlast five well-built wooden flumes without cost for repairs or loss of water.

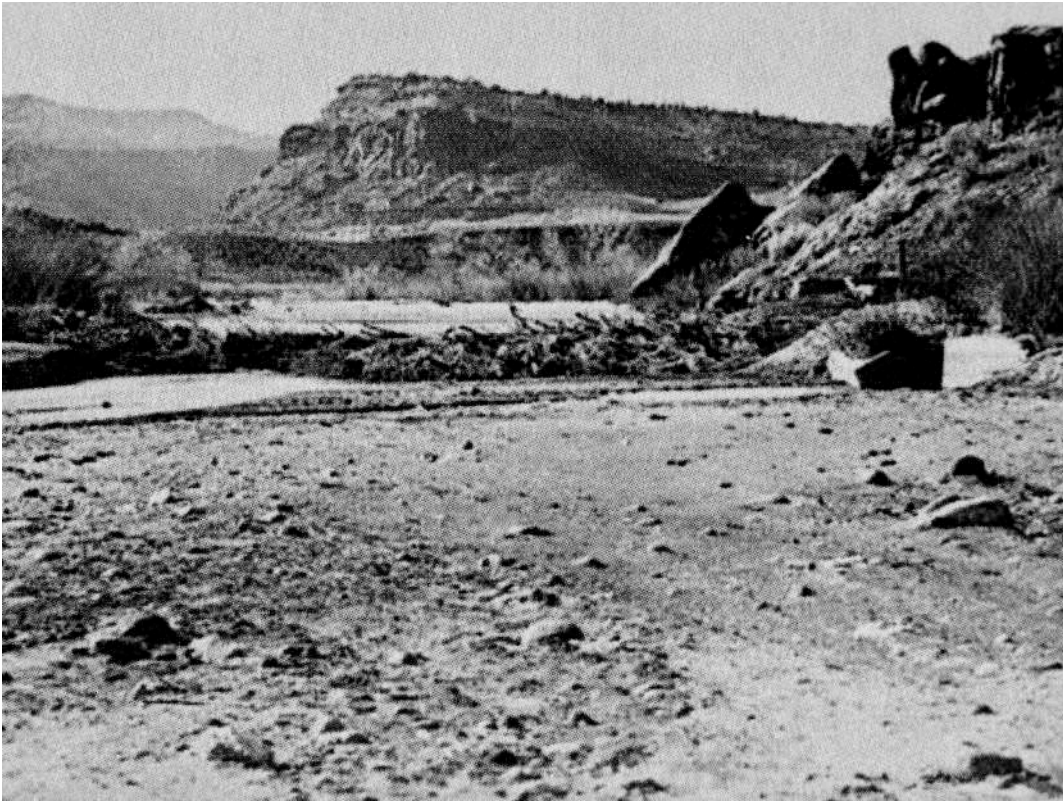
T. C. EGGLESTON
SALES MANAGER 714 Ideal Building, DENVER

A Card will bring you a Catalogue

1910 Advertisement for Galvanized Steel Flume



Wooden Flume on Hurricane Canal (1904)



1933 Santa Bench Canal Diversion Brush Dam

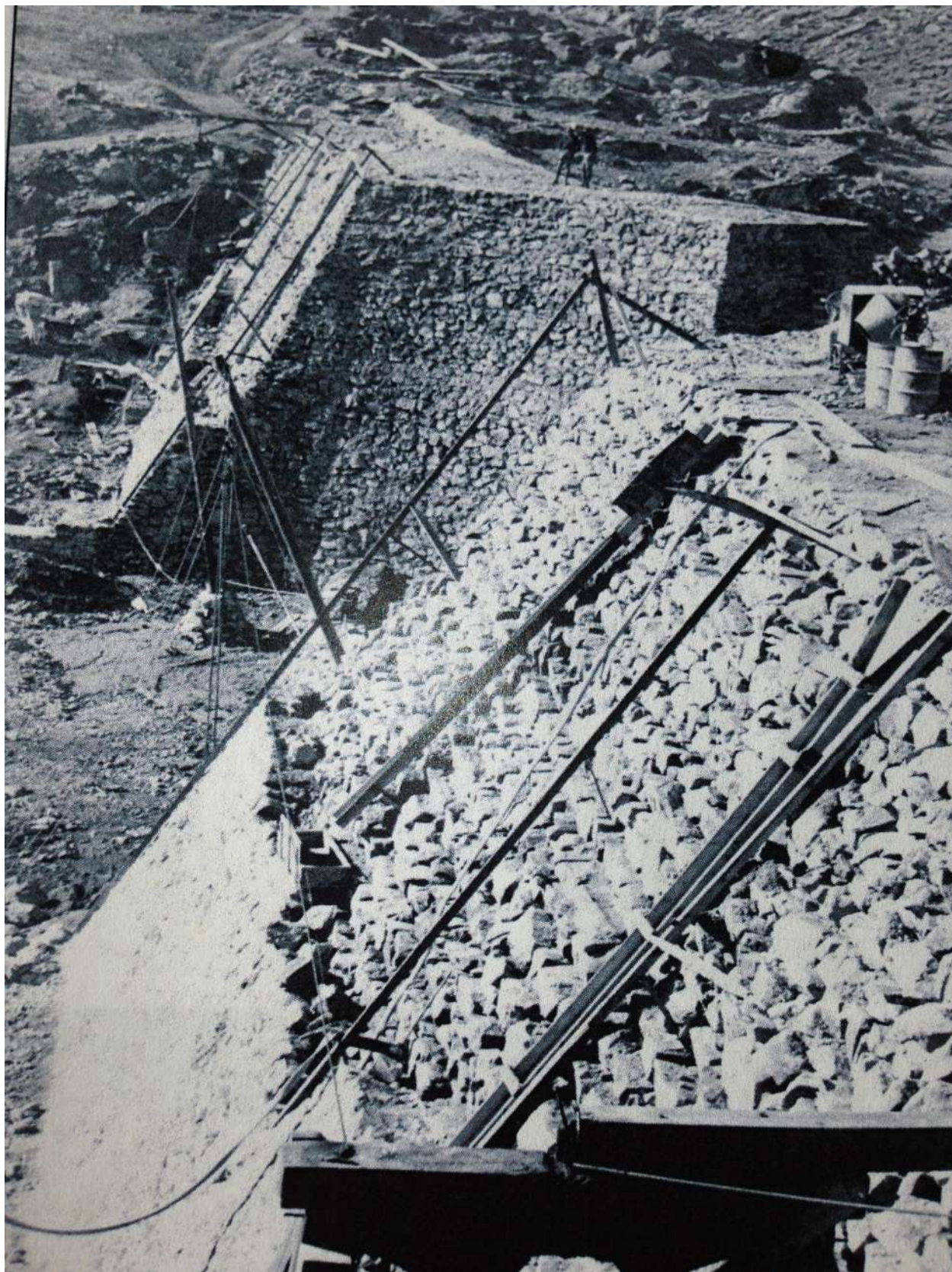


1933 Santa Clara Bench Canal Dignitaries on Site



1933 Santa Clara Creek with Dignitaries





1934 Winsor Dam Construction



1941 Winsor Dam Headgate from left John Hafen, Charles Hafen, Leo Snow

Washington County News 1934

Construction of the dam began in the winter of 1933, with the help of roughly 100 Civilian Conservation Corps workers from the Santa Clara Camp SE-213, Company 961. According to J. C. Tolton, superintendent of the United States Forest Service CCC camp constructing the dam, the government “is building this wholly with the idea of flood control, since it is the policy of the administration... to not bring any more land under cultivation”. However, part of the impetus for building the dam was to store water for the irrigation canal that transported water to fields on the Santa Clara Bench. The dam would be constructed in a way that allowed “water to seep through and come up lower down the stream”. On the north side of the dam would be a tunnel to carry the normal flow of the stream.



1941 Winsor Dam Upstream Silt Deposits



1956 Winsor Dam from Upstream

WASHINGTON, D.C.

November 1933

THE BARRIER SYSTEM FOR CONTROL OF FLOODS IN MOUNTAIN STREAMS

By L. M. WINSOR, *irrigation engineer, Division of Irrigation, Bureau of Agricultural Engineering*

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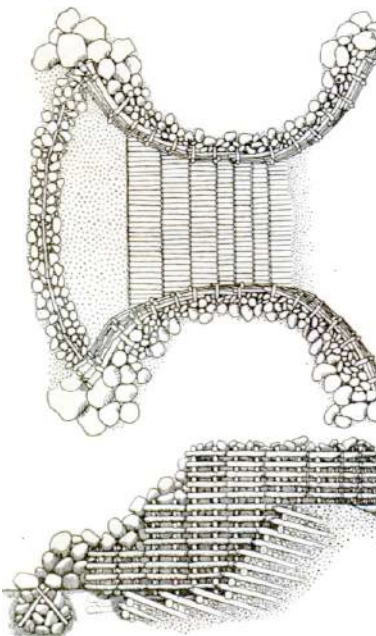


FIGURE 9.—Timber spillway of type B.

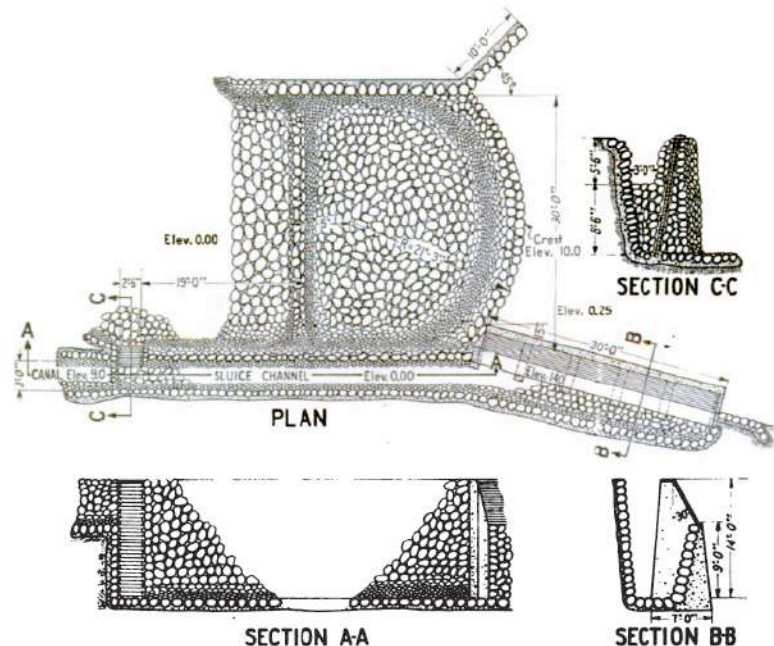


FIGURE 12.—Plan of diversion dam and gravel control works at intake to Willard high-line canal above flood control barrier.

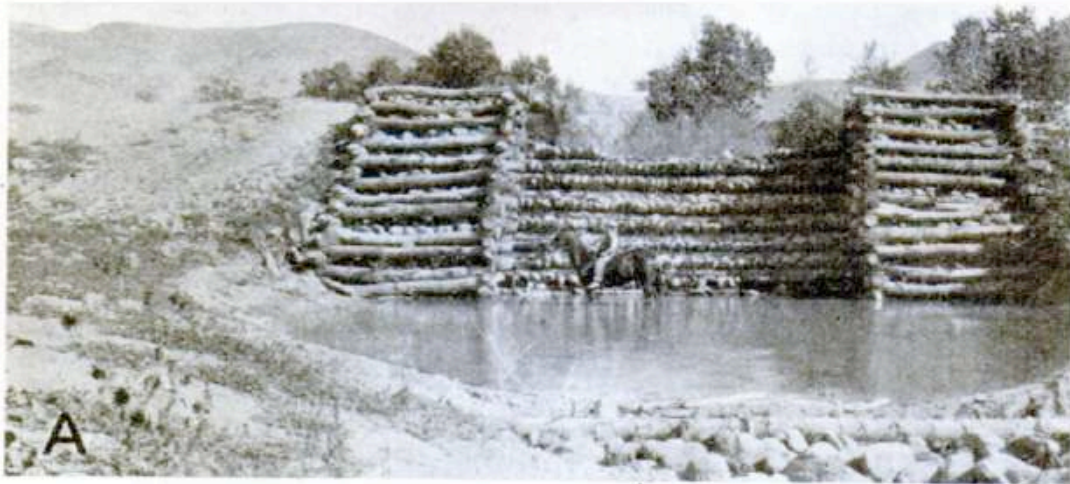


FIGURE 9.—A, Timber and rock spillway, Kanosh Creek, Utah; B, rubble masonry spillway, Willard, Utah; C, spillway with reinforced concrete wings, Kessler Canyon, Utah.



FIGURE 4.—Typical physical characteristics of alluvial fans in the Wasatch Range, Utah: *A*, Vertex of large cone formed by continuous stream; *B* and *C*, vertexes of small steep cones formed by torrential floods.

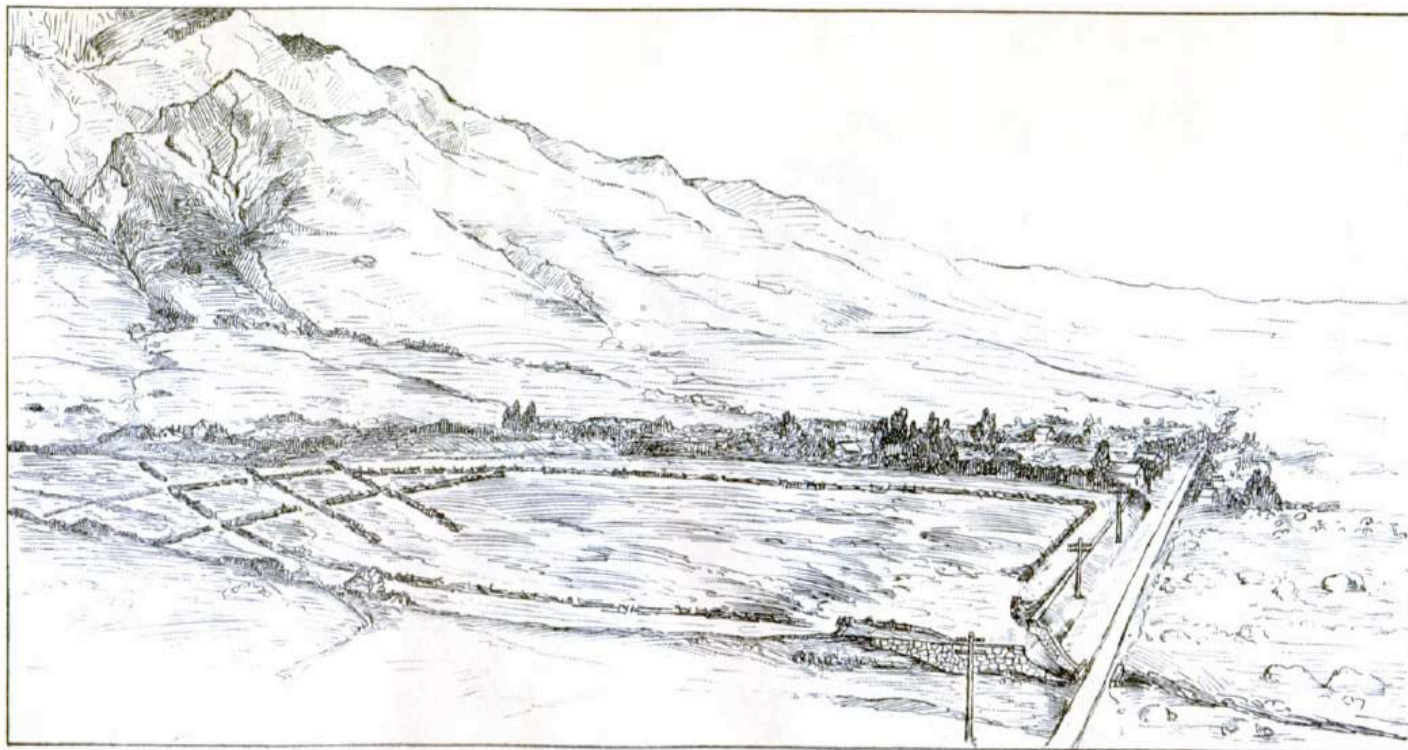


FIGURE 5.—Principal features of a barrier system of flood control.

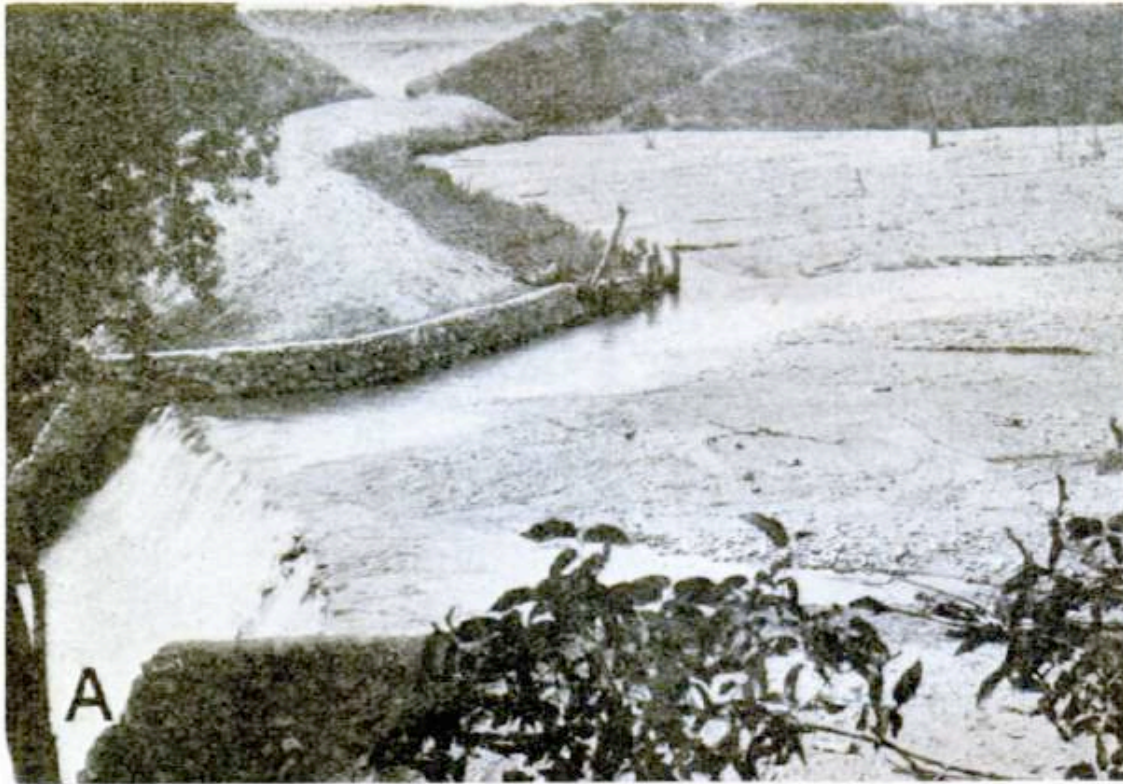
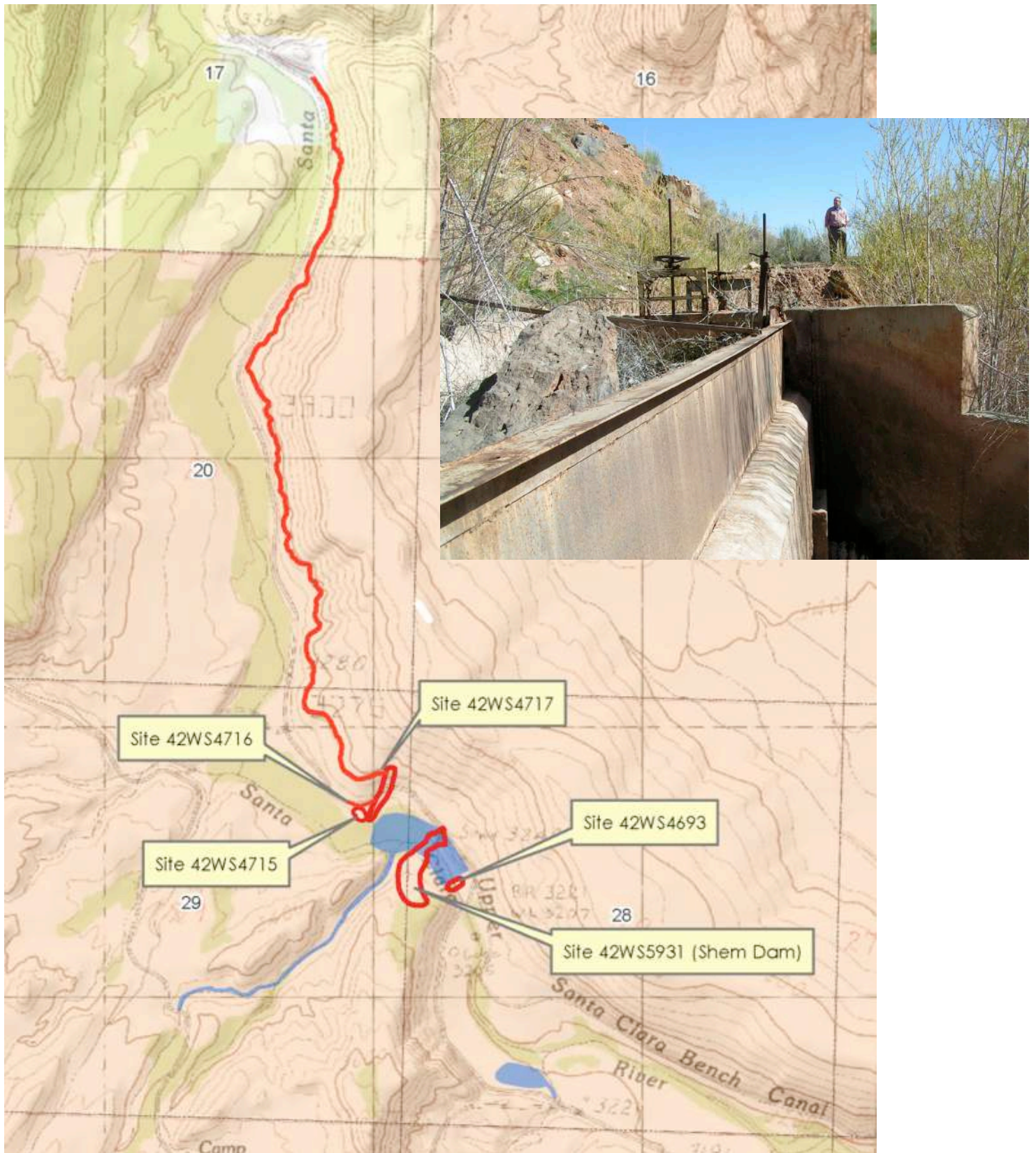


FIGURE 11.—*A*, Farmington barrier spillway just before being raised in 1931; *B*, looking upstream through Santaquin barrier spillway--barrier basin lies at one side of low-water channel. Immediately to right of weir crest, placement of boulders in two vertical lines is faulty; elsewhere it is fairly good.

Shivwitz Reservation, Shem Smelter, Santa Clara Bench Canal, and Winsor Dam
Richard Kohler 2014



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