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Reclamation & Arizona

A Century of Cooperation



Pre 1899 1900s 1910s 1920s 1930s 1940s 1950s
1960s 1970s 1980s 1990s 2000s 2010 +

Welcome to the Bureau of Reclamation's Arizona Centennial Legacy Project.

These web pages illustrate over a century of cooperation between Reclamation and the state of Arizona—for the benefit of the residents of its cities, farms, and tribal lands. We have worked together in developing assured water supplies, while ensuring the protection of cultural and environmental resources. These newspaper issues chronicle that partnership, decade by decade. Reclamation looks forward to continued cooperation as we begin the next century together.

A CENTURY OF COOPERATION

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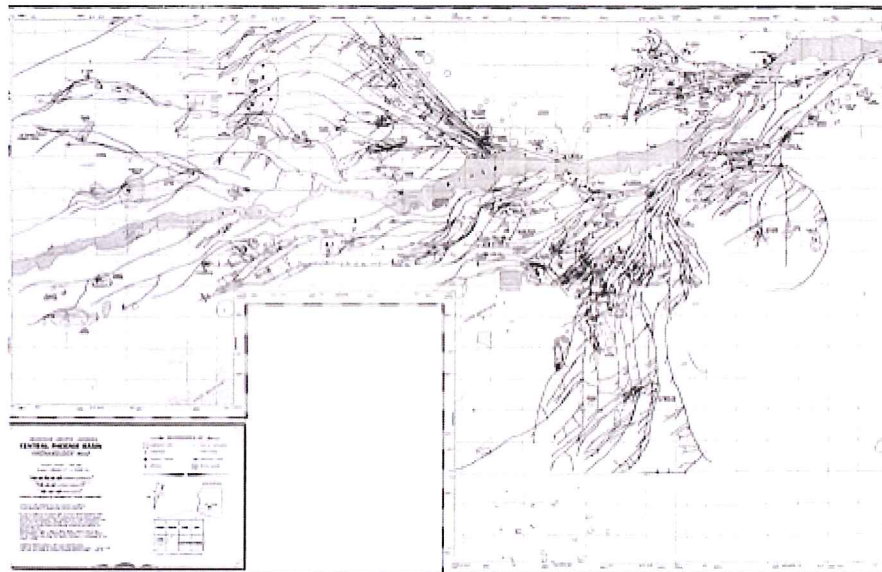


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Pre 1899 Photo Gallery



A 1905 view of Tempe looking southwest from Tempe Butte. Linear alignments of trees usually indicate open canals and ditches. (Reclamation photograph)



The distribution of prehistoric Hohokam irrigation canals in the Salt River Valley,

PRE 1899

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1992. (Map compiled and produced by GEO-MAP, Inc. for Arizona Department of Transportation.)



A 1909 view of an alfalfa field with olive hedge fence. (Reclamation photograph)



The horseman is riding in a prehistoric Hohokam irrigation canal near Mesa, 1907. (Reclamation photograph)



Farm home and irrigation lateral two miles west of Mesa, early 1900s.
(Reclamation photograph)



Desert homestead along the Eastern Canal three miles east of Mesa, 1910.
(Reclamation photograph)



Furrow irrigation on Mr. A.B. Fowler's Ranch, 1911. (Reclamation photograph)



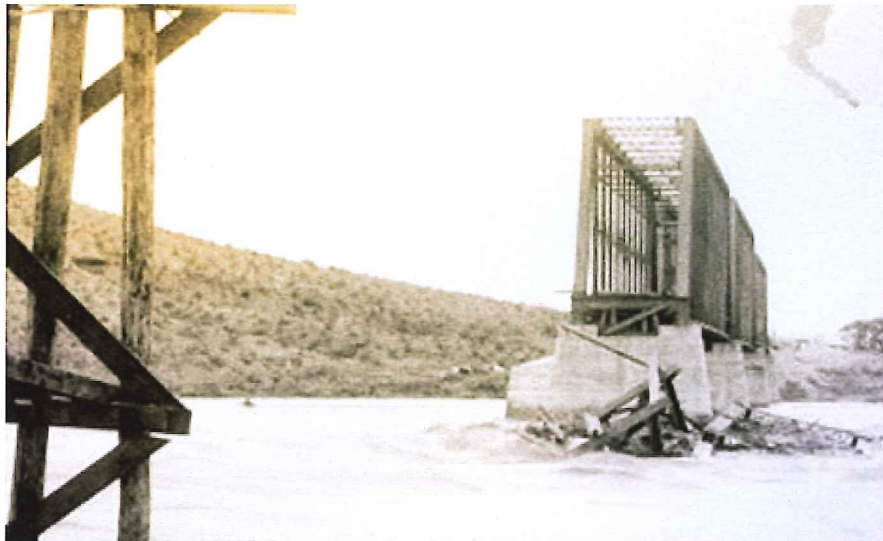
Irrigation turned former desert into productive agricultural land as this hay field near Chandler illustrates, 1906. (Reclamation photograph)



A prehistoric Hohokam canal has been incorporated into the Consolidated Canal in the eastern Salt River Valley, 1906. (Reclamation photograph)



This young orange grove near Camelback Mountain is located on desert soil and receives water from the Arizona Canal. John Wesley Powell's idea to classify lands by their resources was an attempt to ensure that lands with good soil conditions were made available for cultivation. These lands offered a better chance for success by farmers. Land classification eventually became a requirement by the U.S. Reclamation Service (and later the Bureau of Reclamation) for new irrigation projects. (Reclamation photograph)



Flooding on the Salt River created havoc for farmers as well as the Santa Fe Railroad. Floods damaged head gates, washed away diversion dams, and silted-in canals. Scenes like this ultimately led to the request for Federal assistance to build a dam on the Salt. 1905. (U.S. Reclamation Service)



Several miles east of Phoenix, formerly cultivated land has returned to desert. A lateral, visible in the foreground, lies useless because of a lack of water. Droughts, floods, and erratic river flows would plague Salt River Valley farmers until a dam was built to tame the river and some formal organization formed to promote equitable water management, 1902. (Reclamation photograph)

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1900s Photo Gallery



View up the Salt River Canyon below the site selected for Roosevelt Dam, 1904. The dam site was identified as early as 1889 by surveyors. (Reclamation photograph)

1900s

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The cornerstone for Roosevelt Dam was laid September 20, 1906. (Reclamation photograph)



As construction got underway, the Reclamation Service established a lumber mill in the Sierra Ancha Mountains north of the Roosevelt Dam site. A local source for construction lumber was less expensive than hauling it from Mesa, 1904. (Reclamation photograph)



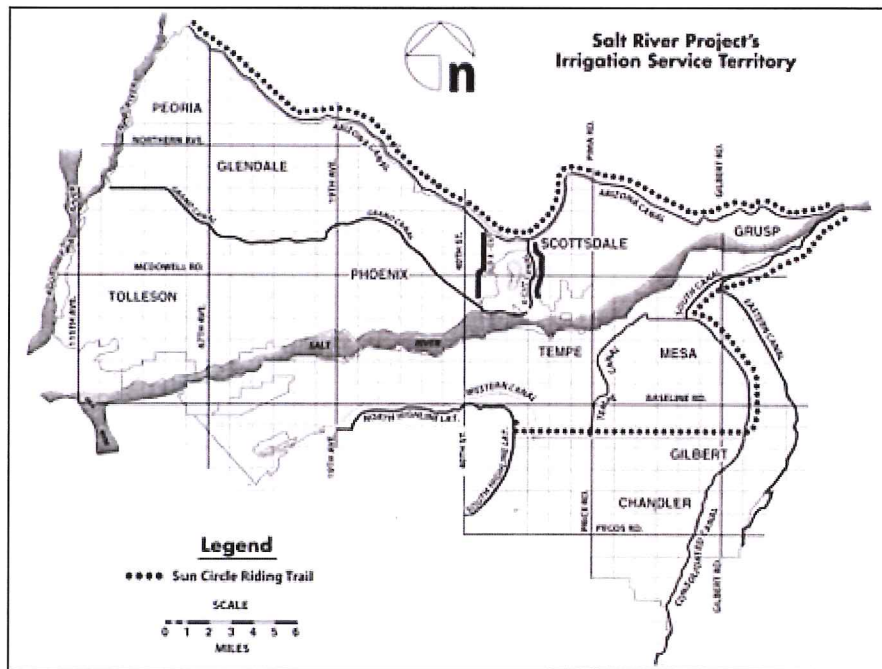
By 1907, construction of the Roosevelt Dam was well underway. (Reclamation photograph)



Flooding was a serious threat during Roosevelt Dam construction, 1908. (Reclamation photograph)



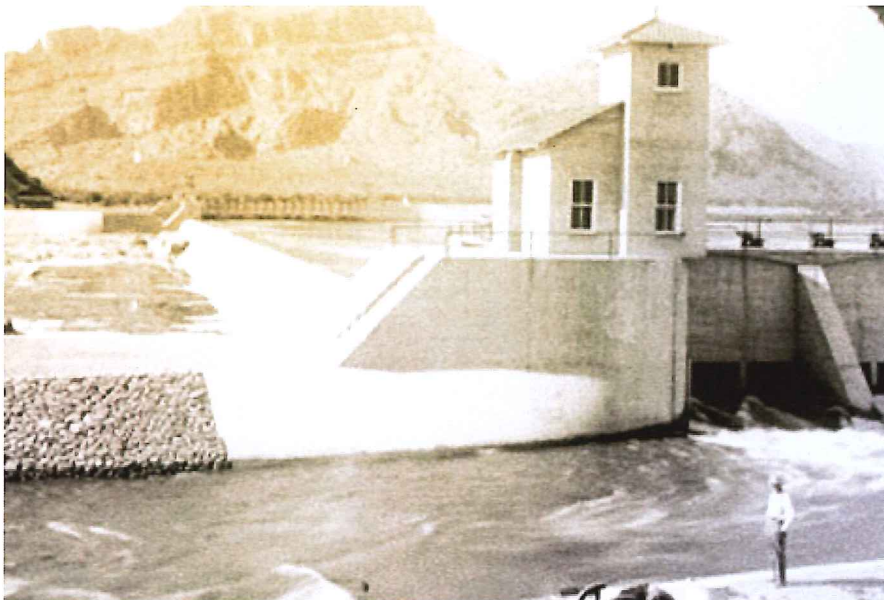
Salt River Valley Users Association Meeting as painted by C. Kemper, 1980. L to R: J.kibbey, P.T. Hurley, W. Christy, H. Simkins, W. Wallace, B.A. Fowler, A.J. Chandler, F. Parker, L. Orme, D. Heard, F. Alkire (seated), G. Maxwell. (Courtesy of Salt River Project)



SRP Canals, Courtesy of Salt River Project



Granite Reef Diversion Dam with outlet for the Arizona Canal around 1910. (Reclamation photograph)



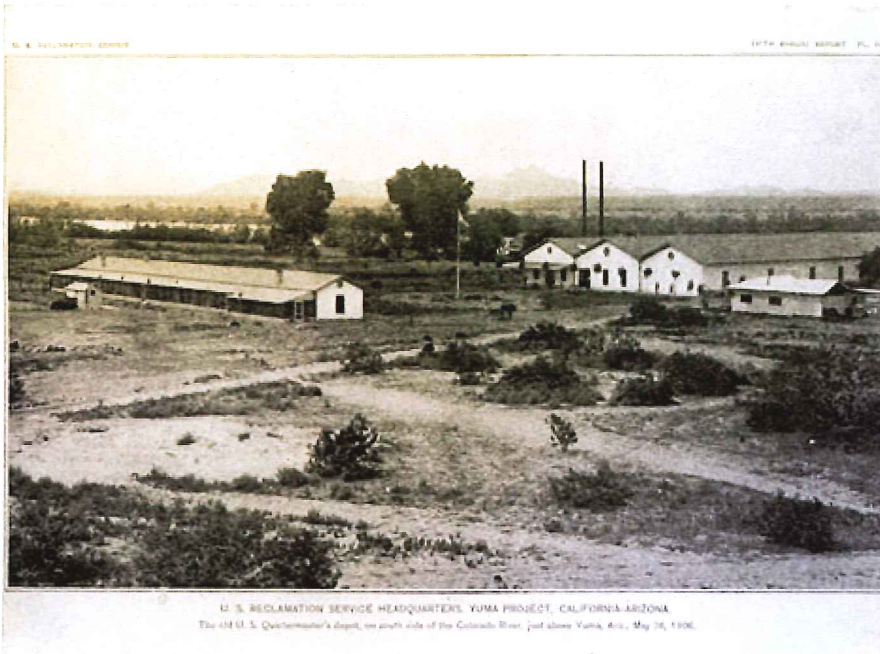
Granite Reef Diversion replaced the crude rock and brush dams that washed out in floods, providing a reliable structure to divert water into the Arizona and South canal, 1910. (Reclamation photograph)



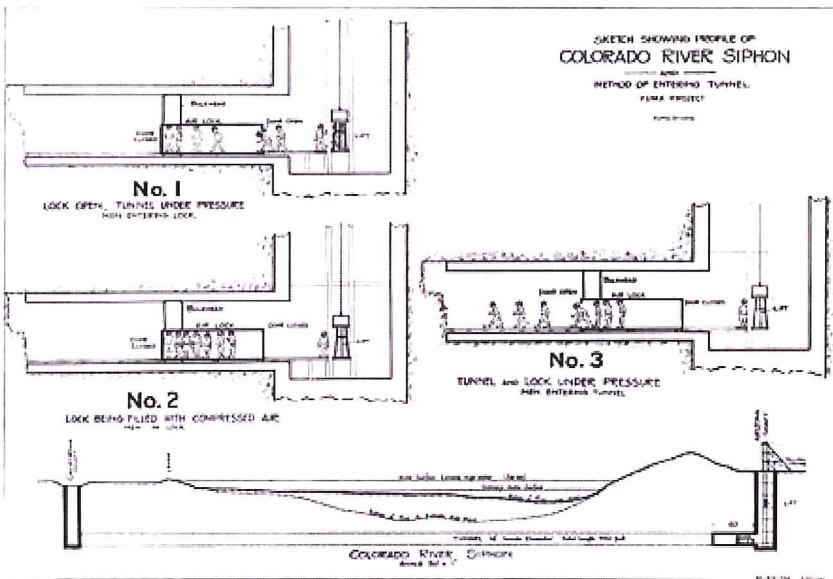
Canal maintenance was an on-going problem, and Government sheep were used to control weeds and grass along the canals, 1914. (Reclamation photograph)



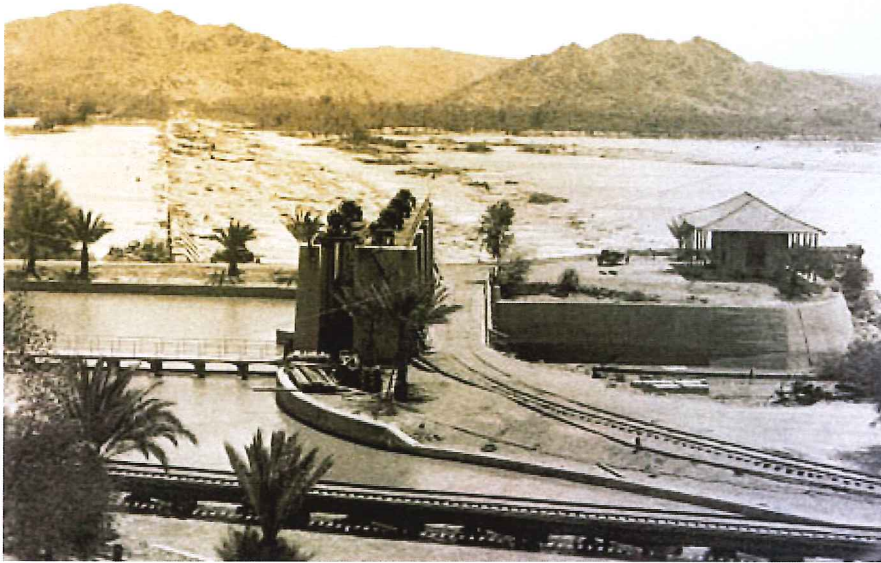
In 1864, the U.S. Army established the Yuma Quartermaster Depot on the Arizona side of the Colorado River where a six-month supply of goods was kept at all times. This is the earliest and one of few photographs of the depot taken before 1871. (Reclamation photograph)



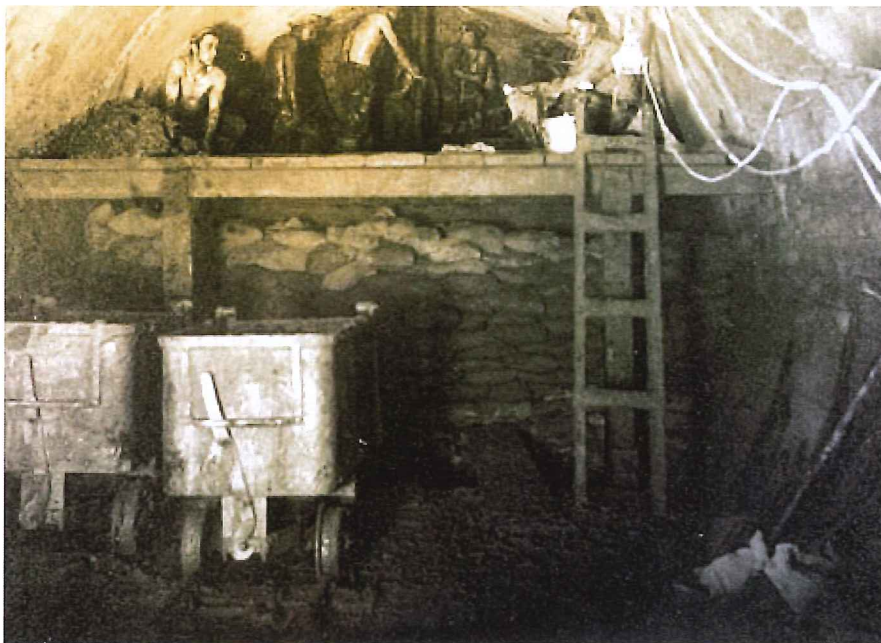
U.S. Reclamation Service headquarters, Yuma Project, located at the former Fort Yuma U.S. Army Quartermaster Depot and Yuma Crossing. (Yuma Projects Office Fifth Annual Report, May 26, 1906)



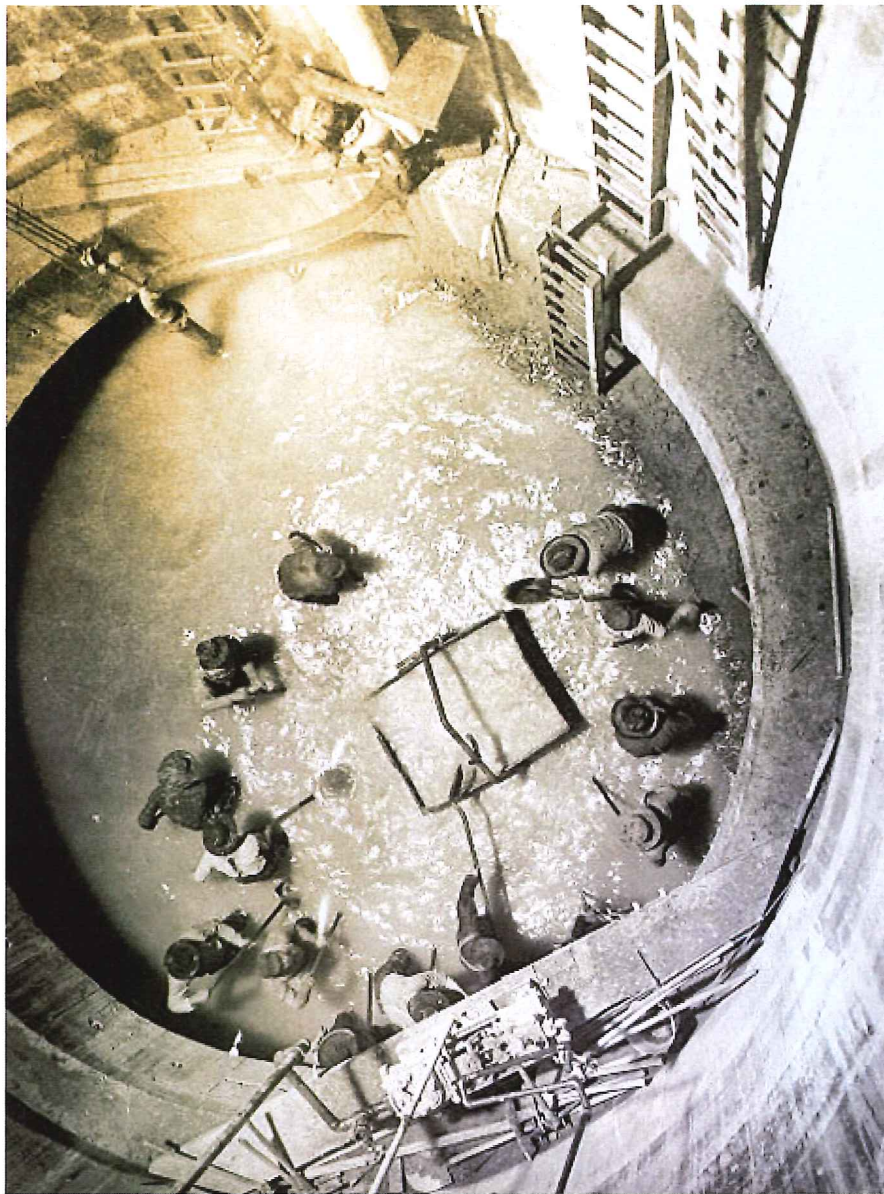
Sketch of the Colorado River Siphon. (National Archives, Yuma Projects Office, No date)



View of Laguna Dam showing the desilting basin, sluice gates, and Yuma Canal regulating gates. (National Archives, Yuma Projects Office, No date)



Sand hogs at work on the heading of the Colorado River Siphon tunnel underneath the Colorado River. A "sand hog" is a slang term for construction workers who work underground on a variety of construction projects. A bulkhead of sandbags was built at the end lower of the tunnel while excavation continue in the upper half of the tunnel. The sandbags prevented water from seeping in on the sand hogs while the arch was being drilled, 1912. (National Archives, Yuma Project Office)



Colorado River Siphon. Looking down 55 feet into the Arizona shaft during the night shift, 1910. (National Archives, Yuma Projects Office)



American Indian laborers were hired by Reclamation Service Chief Engineer Lewis Hill. San Carlos and other Western Apache tribes supplied the bulk of the work force for Roosevelt Dam road construction and other infrastructure needs, 1906. (Reclamation photograph)



Apache workers on the cutoff canal, Roosevelt Dam site, 1909. (Reclamation photograph)



Apache road crew working on the road between Globe and Roosevelt, 1904. (Reclamation photograph)



Apache teamsters placing fill on the new Tonto Highline Road. Note the dry-laid masonry retaining wall. (Reclamation photograph)



Apache workers were known for their skill in building dry-laid stone walls. Without using mortar, they constructed many such retaining walls along the various roads they built. This fine example is on Fish Creek Hill on the Mesa to Roosevelt Road, known today as the Apache Trail, 1905. (Courtesy of Salt River Project)



Apache workers often brought their families to live with them. They lived in a segregated area and maintained their traditional lifestyle. Here an Apache woman brings firewood to her wickiup, a structure of bent poles covered with brush that is also covered with blankets, tarps, and hides. Note the use of large ceramic storage jars and metal pots and pans, 1911. (Reclamation photograph)



A portion of Mesa to Roosevelt Road at Fish Creek Hill. Note the extensive road work required to cut through the mountain and provide fill for a stable road bed. American Indians, primarily Apaches, constructed over 100 miles of roads to provide access for men, equipment, and supplies to the dam site, 1905. (Reclamation photograph)



Wagon on road between Mesa and the Roosevelt Dam site, 1904. (Reclamation photograph)

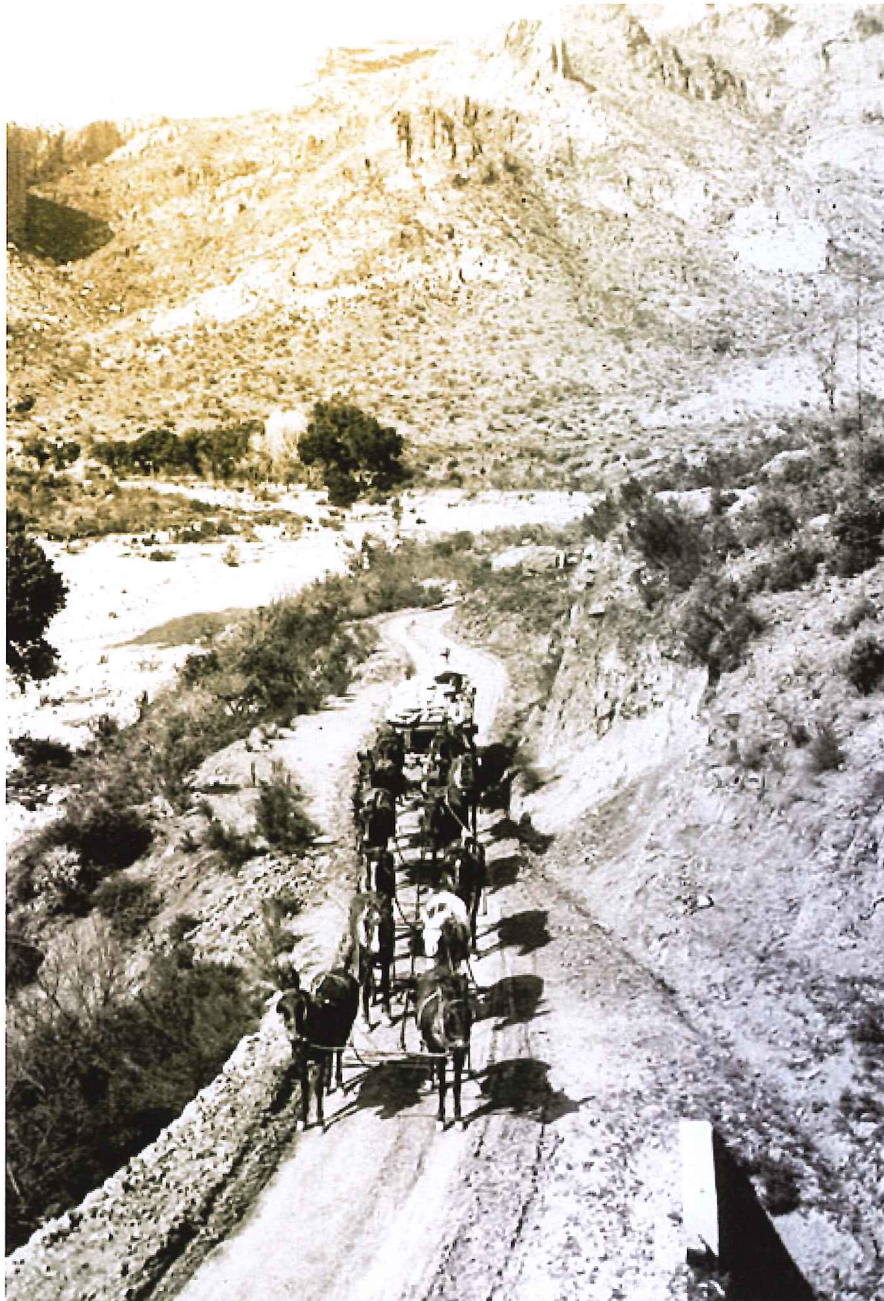
*Freighting from Globe to dam site - Feb 6, 1904
#229*



Freight wagons with mule team bringing supplies to the Roosevelt Dam site on the road from Globe, 1904. (Reclamation photograph)



Government freight wagon at foot of Fish Creek Hill on way to dam site, 1907.
(Reclamation photograph)



Government freight wagon (previous picture) entering Fish Creek Station, 1907.
(Reclamation photograph)



Government freight wagon coming up Fish Creek Hill, 1907. (Reclamation photograph)



Freight wagon with generator headed for Roosevelt Dam from Mesa, 1907. (Reclamation photograph)



Freight wagon teams at Government Wells on way to Roosevelt Dam, 1907. (Reclamation photograph)



Assisting stage coach on Roosevelt Road, 1910. (Reclamation photograph)



Wagon and horses at Government Wells, n.d. (Reclamation photograph)



Freight wagon with luggage and baggage belonging to Italian stone masons from Pennsylvania hired to work on construction of the dam, 1906. (Reclamation photograph)



Teamsters preparing lunch at Grapevine Springs en route from Glode to Roosevelt, 1906. (Reclamation photograph)



Freight wagons boarding Reclamation Service ferry at Roosevelt, 1910.
(Reclamation photograph)



A team of horses and mules pull a small steam locomotive towards the Roosevelt Dam site, No date. (Courtesy of Salt River Project)



In this photograph, two freight wagons approach the construction site for the Roosevelt Dam, No date. (Courtesy of Salt River Project)

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1910s Photo Gallery



President Theodore Roosevelt at the formal dedication of Roosevelt Dam, March 18, 1911. (Reclamation photograph)



1910s

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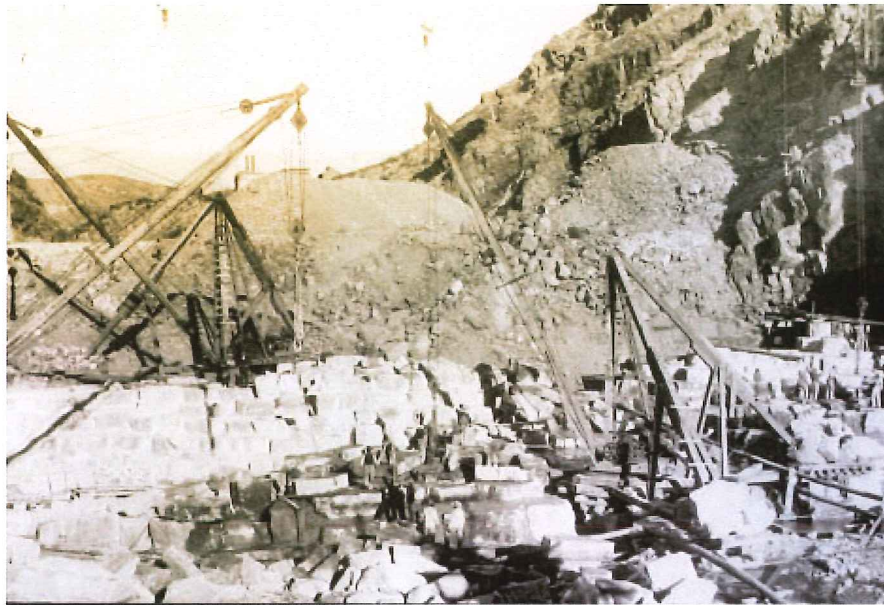
[The Man Behind the Camera: Walter J. Lubken](#)

[The Men Who Built the Dam](#)

SPECIAL POINTS OF INTEREST

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Crowds gathering at the finished dam to hear President Theodore Roosevelt speak at the formal dedication on March 18, 1911. (Reclamation photograph)



Excavation at dam site, 1906. (Reclamation photograph)



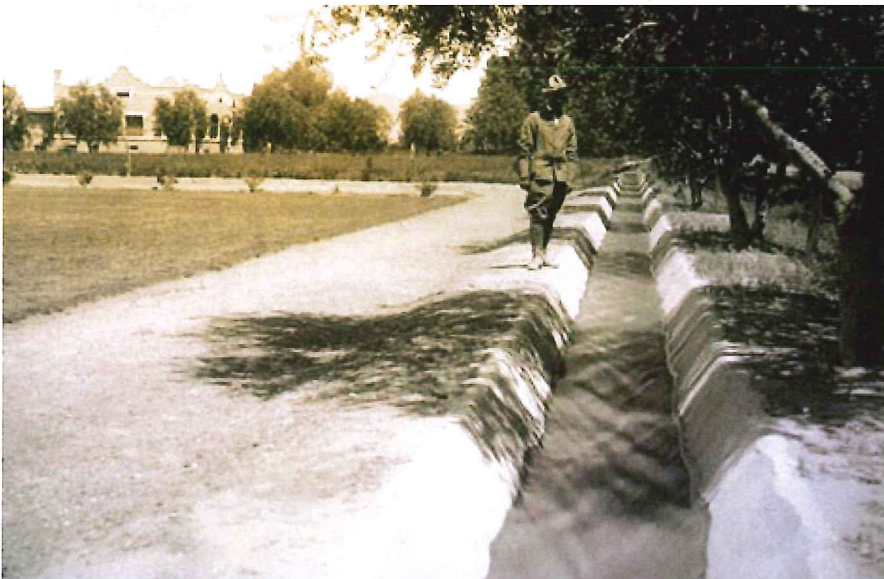
View of the dam, 1909. (Reclamation photograph)



View of the dam nearing completion, 1910. (Reclamation photograph)



View of the completed dam looking upstream, 1923. (Reclamation photograph)



Improvements made to irrigation systems included lining laterals to conserve water, such as the cement-lined irrigation ditch on the Mallin Ranch about six miles north of Phoenix, 1910. (Reclamation photograph)



Drilling wells provided water for farmers, but by the second decade of the 20th century, farmland in the Salt River Valley was becoming saturated from too much irrigation. In this case, wells were drilled to remove water from water-logged fields, 1909. (Reclamation photograph)



Near the end of the new Crosscut Canal a 500-foot-wide ravine required an elevated flume to carry water to the forebay before reaching the turbines at the hydro plant, 1914. (Reclamation photograph)



The purpose of the forebay was to hold a steady head of water for power generation. More importantly, it allowed the water to settle and drop its silt and sand to the bottom of the forebay where could be flushed out as necessary, 1914. (Reclamation photograph)



Construction of the Crosscut Powerhouse. Henry T. Cowling, 1914.



The Consolidated Canal was constructed in 1891 by the Consolidated Canal Company founded by A. J. Chandler. It extended the Mesa canal some 19 miles south to the boundary of the Gila River Indian Reservation. This 1920 photograph

shows work being done on a portion of the canal. (Reclamation photograph)



Lubken took this photo of his car and, presumably, his dog in March 1907 somewhere near the town of Roosevelt. The Salt River floodplain is in the background. (Reclamation photograph)



Photographs of Walter Lubken are rare. In this photograph, Lubken is on the left holding a cigar. The photograph was taken at Arrowrock Dam, Idaho, in 1912. (Reclamation photograph)



Lubken took a number of photographs of Western Apaches during his time at Roosevelt. Here is an Apache basketmaker, probably at an Apache camp located near the dam construction site. Apache workmen and their families lived in camps segregated from the other workers. (Reclamation photograph)



Granite Reef Diversion Dam is located east of Phoenix and diverts water from the Salt River into the Arizona and South canals on the north and south sides of the river, respectively. This 1910 photograph shows the water being diverted into the South Canal. (Reclamation photograph)



Lubken traveled repeatedly on the Mesa-Roosevelt road between the Salt River Valley and the dam site. At Government Wells where water was available, he captured supply wagons headed to the dam site in December 1907. (Reclamation photograph)



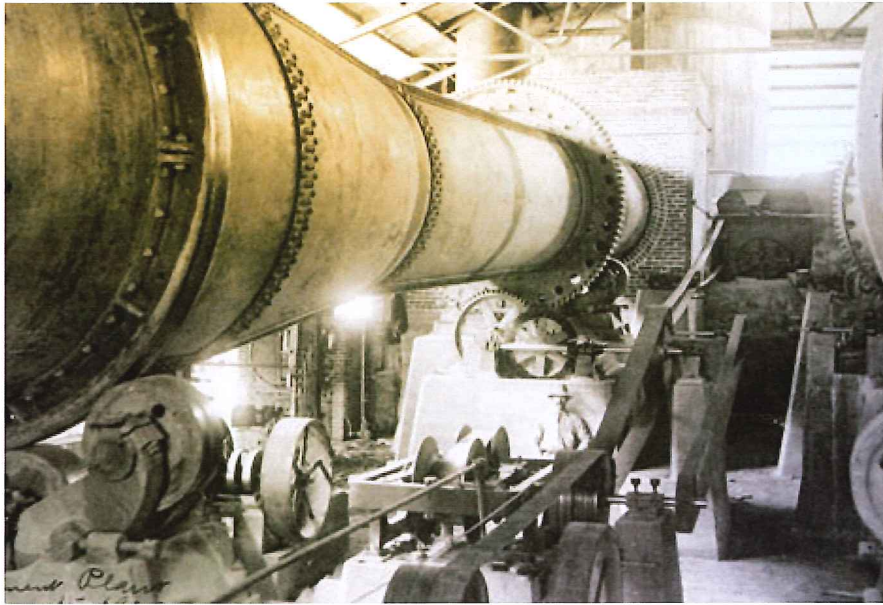
Lubken primarily documented the construction of Roosevelt Dam while in Arizona.
This 1909 photograph shows the massive wall of the dam still under construction.
(Reclamation photograph)



Roosevelt Dam is essentially completed in this photograph, probably taken in late 1910 or early 1911. (Reclamation photograph)



Cement was made at the dam site to save money by avoiding the cost of hauling it from Phoenix. In this 1904 photograph, Lubken captures construction workers building the cement plant. (Reclamation photograph)



In 1905 Lubken photographed the interior of the newly finished cement plant. Lubken photographed many aspects of the different kinds of facilities that were built on or near the dam site such as the cement plant and a lumber mill in the mountains north of the dam. (Reclamation photograph)



This 1914 photograph of the San Marcos Hotel in Chandler is one of numerous images by Lubken of the buildings, agriculture, canals, and places in the Salt River Valley. For a period of time, Lubken had a small shop in Mesa where he sold postcards of his images. (Reclamation photograph)



Roosevelt Dam was designed as a masonry dam that required each block of stone to be precisely cut and shaped. Stonemasons from around the world were sought out and hired for the demanding job. Masons of German, Scottish, Italian, and Swiss heritage worked on the dam. Here twenty-six Italian stonemasons from the East Coast pose for the Reclamation Service photographer Walter J. Lubken in 1906. (Reclamation photograph)



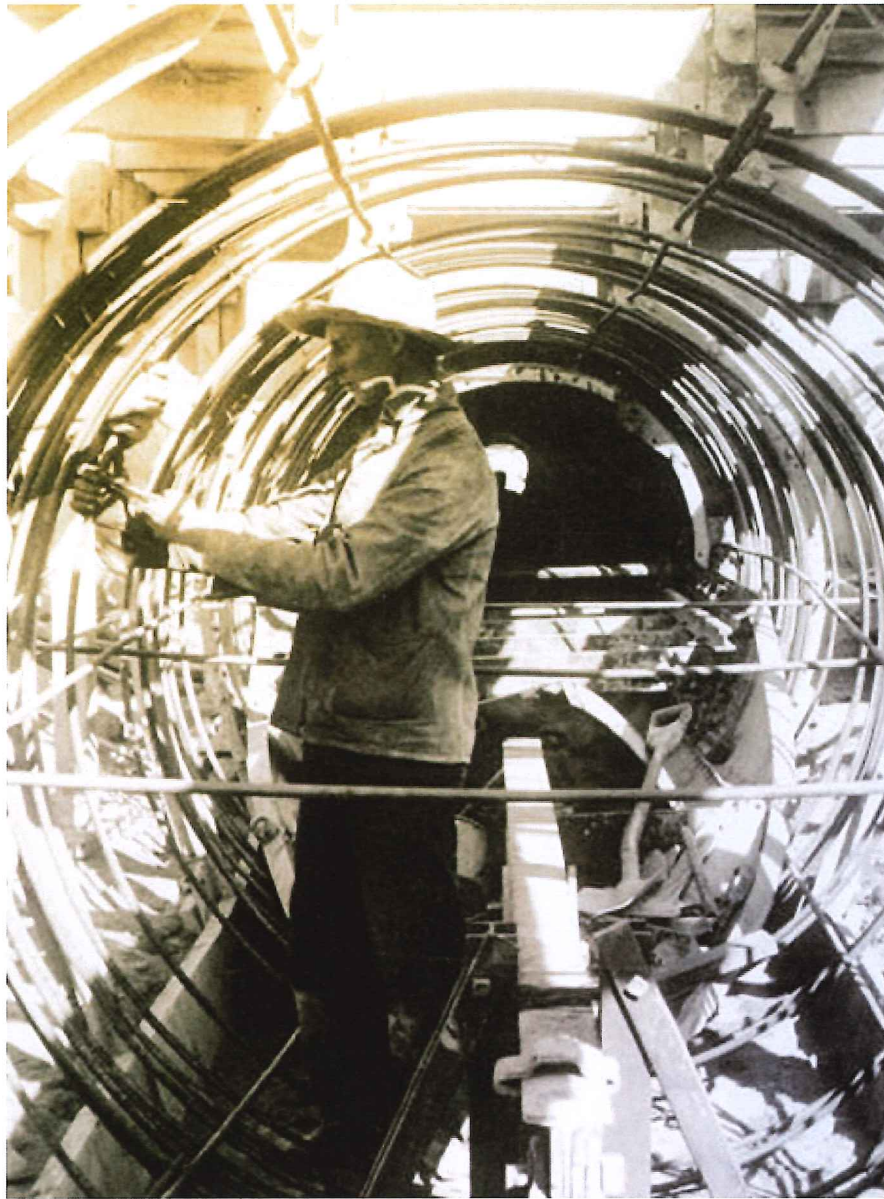
Workers from Arizona Territory—Black, Indian, Mexican, and Anglo—were joined by hundreds of other workers from numerous ethnic backgrounds from across the United States to work on Roosevelt Dam. Here they are pictured excavating the foundation for the dam, 1906. (Reclamation photograph)



On September 20, 1906 workers ease the cornerstone of the dam into place. (Reclamation photograph)



Because it was expensive to haul supplies from Mesa to the dam, the U.S. Reclamation Service built a cement plant on site, 1910. (Reclamation photograph)



A hydropower plant provided electricity for the people building the dam and for running power equipment. Water for the generating units was brought via a diversion channel which crossed large drainages through a buried siphon. Here a workman is preparing the rebar frame for a siphon across Pinto Creek, 1905. (Reclamation photograph)



Apache workers built the road between Mesa and the dam site known as the Mesa–Roosevelt Road, 1907. By the 1920s it was called the “Apache Trail.”
(Reclamation photograph)



Like many Anglo workers, Apache families joined the men who worked on the dam. Apache families camped in segregated areas near the dam. (Reclamation photograph)



It's wash day in Roosevelt Town. Note the wood-framed tents used to house the workers' families, 1909. (Reclamation photograph)

Luther Jackson and his family on the porch of their home, probably at Roosevelt. Luther was a ditch rider, most likely on the diversion canal that brought water to the generating plant. He was responsible for seeing that the canal worked as planned and was properly maintained, 1909. (Reclamation photograph)

This 1904 photograph shows the dam builders assembled for a special event. The supervisors and engineers are on horseback, while workers and some of their wives sit or stand. (Reclamation photograph)

Citrus was a major economic crop in the Salt River Valley. Here, boxed citrus is ready for market. (Reclamation photograph)

Alfalfa fields were common throughout the valley, and milk cows were another part of the valley economy. (Reclamation photograph)

Citrus orchards dotted the valley once a reliable water supply was assured with the completion of Roosevelt Dam. (Reclamation photograph)

Amber waves of grain with Camelback Mountain on the horizon. (Reclamation photograph)

A reliable water supply allowed for flood irrigation of some fields. (Reclamation photograph)

Raising ostriches for their feathers supplemented the income of Chandler farmers until fashions changed and ostrich feather hats went out of style. (Reclamation photograph)

This sugar beet field was located in Glendale. Russian immigrants familiar with growing sugar beets were hired to tend the fields. (Reclamation photograph)

A young child stands ankle-deep in an irrigated field of what may be broad-leaf lettuce. (Reclamation photograph)

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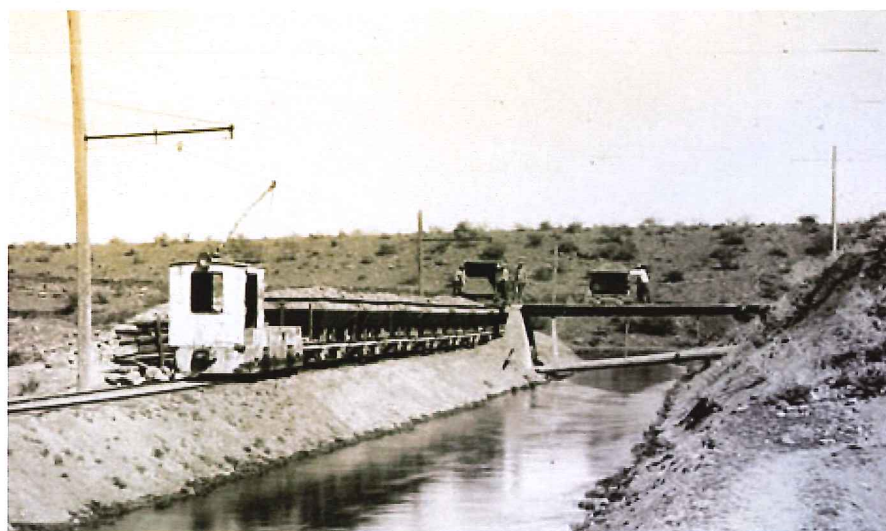
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1920s Photo Gallery



An electric engine is hauling cars filled with clay for use in the construction of Roosevelt Dam. The tracks are adjacent to the power canal that was built to divert water from the Salt River and carry it to a penstock near the dam site where it fell 220 feet to power a water turbine. The penstock and turbine were temporarily located in small cave south of and below the dam site. Electricity generated by the turbine provided power for this engine and a host of other tools and appliances at the dam site and the nearby town of Roosevelt, 1905. (Restoration photograph)

1920s

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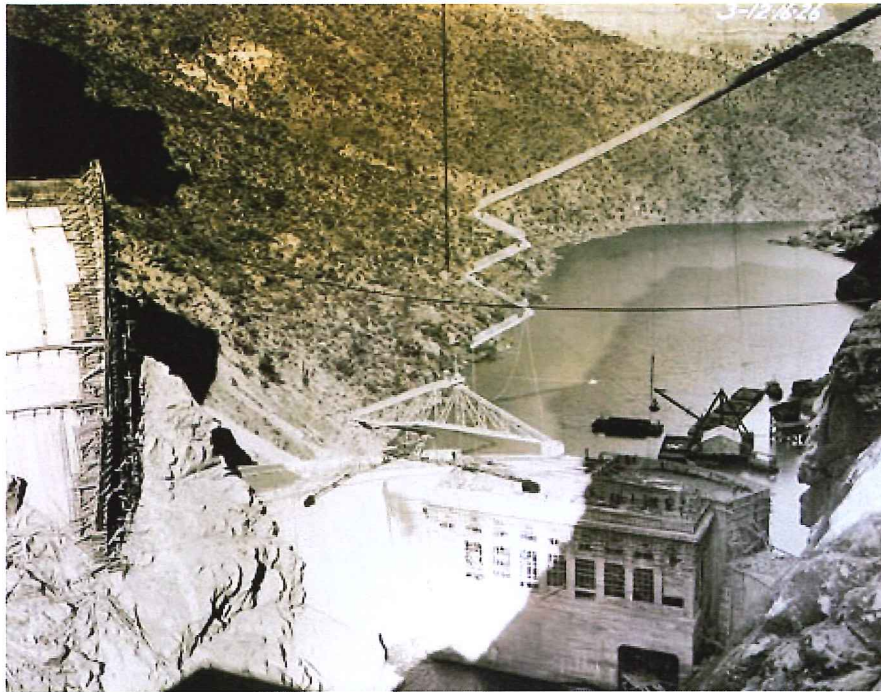
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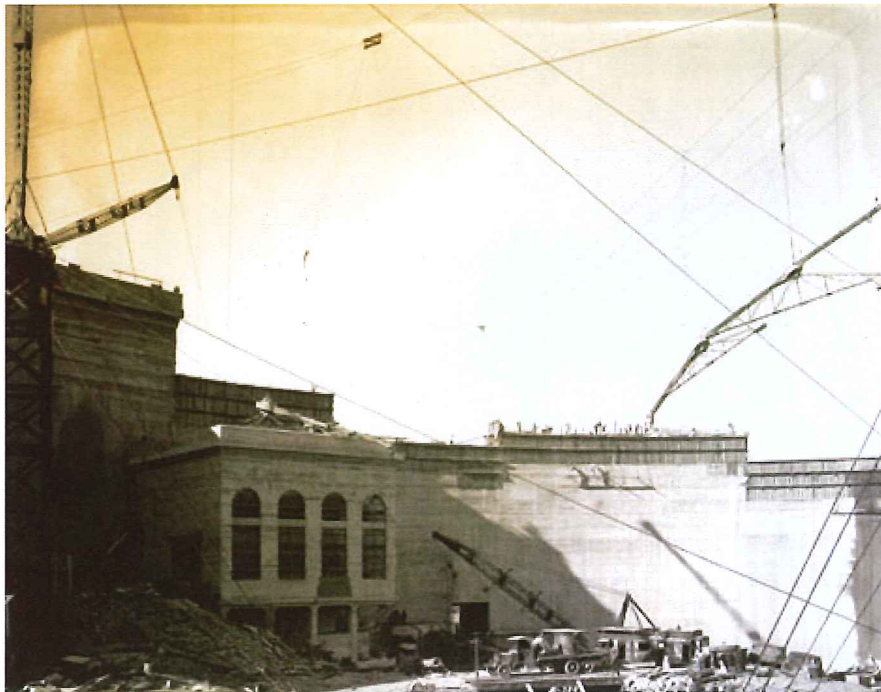
In the late 1800s, Phoenicians enjoyed the wonders of Arizona Falls, gathering there to picnic, socialize, and dance near the cool water. Located on the Arizona Canal between 56th and 58th Streets, Arizona Falls, built in 1902, was the first hydroelectric plant in Phoenix. Here the Arizona Canal drops 20 feet, and it was this falling water that was harnessed to produce power. The hydroelectric plant was one of four such plants located on canals in the valley. (SRP photograph)



Constructed by the Salt River Valley Water User's Association between 1923 and 1925, Mormon Flat Dam was the first facility in the Association's privately-funded hydropower expansion program. It was built for the dual purposes of generating hydroelectric power and for storing approximately 57,000 acre-feet of water in its reservoir, Canyon Lake, for agricultural and urban/commercial uses in the Salt River Valley. In a radical departure from the design used by the U. S. Reclamation Service for Roosevelt Dam, C.C. Cragin designed a concrete, thin-arch structure with a height (streambed to crest) of 224 feet. The dam's crest is 380 feet long, with a top width of 8 feet and a maximum base width of 20 feet. (SRP photograph)



As the second dam constructed from 1924 to 1927 by the Salt River Valley Water Users Association, Horse Mesa Dam was to provide inexpensive power to the copper mines of Globe and Miami. Financing from Inspiration Consolidated Copper Company allowed for construction, and the Company agreed to purchase all the Horse Mesa's power. The dam was designed by C. C. Cragin and Bureau of Reclamation engineers. The result was a concrete thin-arch dam standing 305 feet high from bedrock to the top of the coping and a crest length of 660 feet. Thickness at the base varies from 43 to 57 feet, with the dam being 8 feet thick at the top. The arch's maximum span is 450 feet. (SRP photograph)



Stewart Mountain Dam is a 207-foot-high, reinforced concrete radius, thin-arch dam consisting of a single arch flanked on both sides by gravity buttresses or abutments, with a gravity overflow spillway on the east side. The main arch stretches 480 feet from buttress to buttress and varies in thickness from eight feet at the crest to 33 feet at the deepest foundation. Built between 1928 and 1930, it was the last of the dams built by the Salt River Valley Water Users Association to provide both power and irrigation water to Valley residents. (SRP photograph)



Flooding of the Imperial Valley in California during 1902-1905, when the Colorado River broke through its embankment, contributed to the decision to build a dam on the river. (Reclamation photograph)



The Colorado River Commission, with Secretary of Commerce Herbert Hoover serving as chairman, met in Santa Fe, New Mexico, in the Fall of 1922. Here, during a sometimes contentious meeting, they hammered out an agreement governing future water rights allocation on the Colorado River. The resulting Colorado River Compact divided the river into an "Upper Basin" comprised of Wyoming, Colorado, Utah, and New Mexico and a "Lower Basin" comprised of Nevada, Arizona, and California that lies downstream from Lee's Ferry near the Utah/Arizona border. (Reclamation photograph)



Both Boulder Canyon and Black Canyon (pictured) offered dramatic, narrow gorges with steep walls climbing upwards from the river for hundreds of feet. By 1924, a dam site in Black Canyon was determined to be the preferred choice. The new location provided a larger reservoir pool and would be less costly to construct based on anticipated savings in material and logistical expenses. (Reclamation photograph)



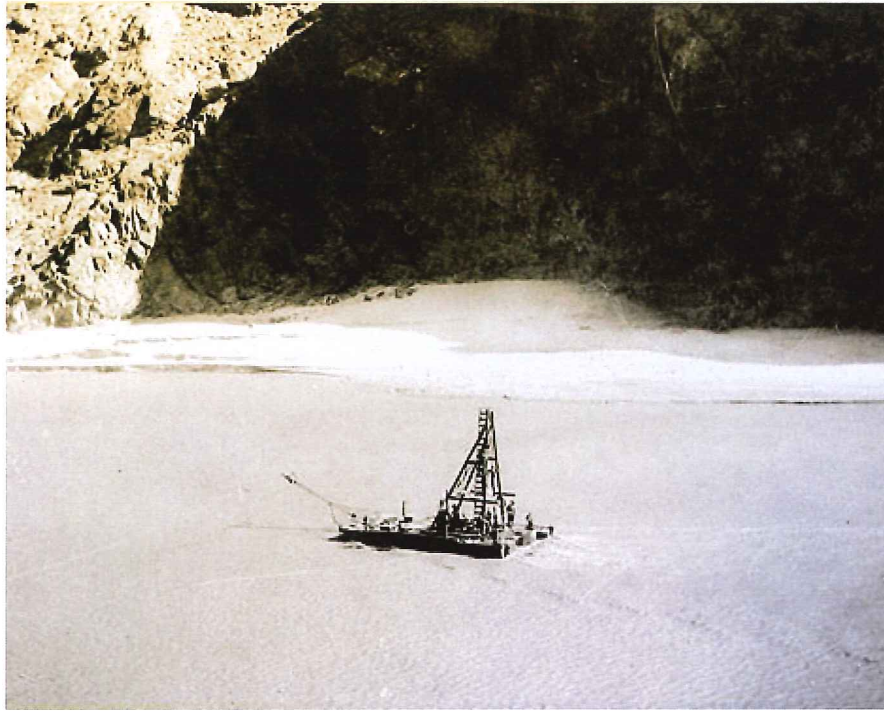
Black canyon dam site with beginnings of a construction camp in the background. (Reclamation photography)



View of Black Canyon. (Reclamation photograph)



This photograph shows preliminary work on the Black Canyon site. Note portals to tunnels No.2, No. 3, and No. 4. In the upper left, a retaining wall on the road to dam, can be seen. The dam site is located at the uppermost bridge crossing the river.
(Reclamation photograph)



A 1922 photograph shows a barge with a drill testing the river bed to assess its composition and structure. (Reclamation photograph)



When the Colorado River drained into the Imperial Valley, this steamboat was left high and dry on the river. (Reclamation photograph)



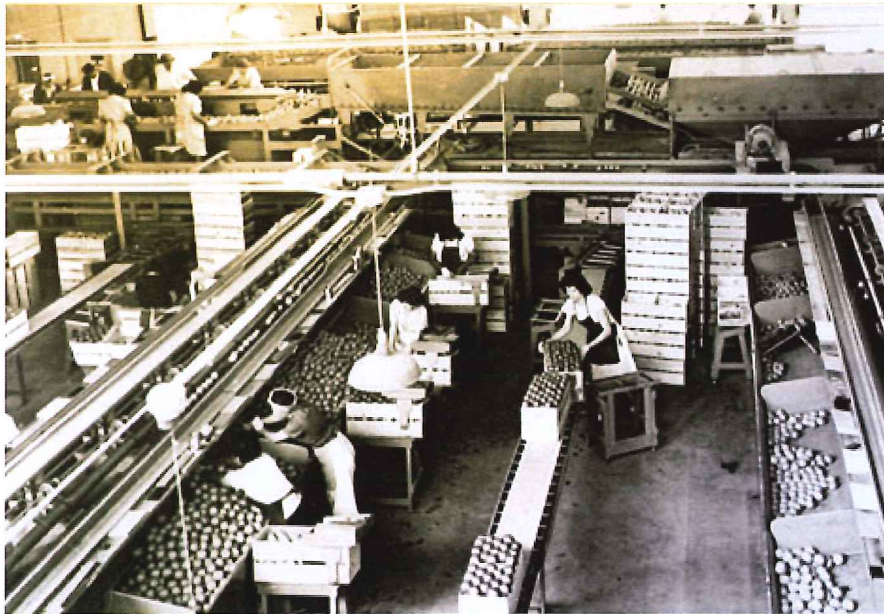
Serious erosion along the banks of the Colorado occurred when the river overflowed.
(Reclamation photograph)



A farmer and the Project Manager close a deal on a farm plot on Yuma Mesa. No date. (Reclamation photograph)



This 1922 photograph shows the forebay of the new power plant for the pump station constructed at the base of Yuma Mesa. (Reclamation photograph)



Citrus packing shed of the Yuma Mesa Fruit Growers where workers grade and package fruit after it has traveled via a conveyor belt through cleaning and washing machines. (Reclamation photograph)



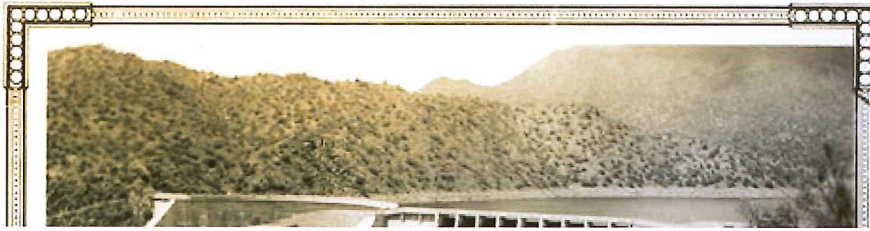
Superintendent Charles C. Cragin (left) and SRP President Frank Reid played key roles in moving the Salt River Valley Water Users' Association into the power generation business. Cragin's plan for building three new dams on the lower Salt River ensured that the Association would become a major hydroelectric supplier for the Salt River Valley. (SRP photograph)



Mormon Flat Dam was the first of the hydroelectric dams to be built on the Salt River. (SRP photograph)



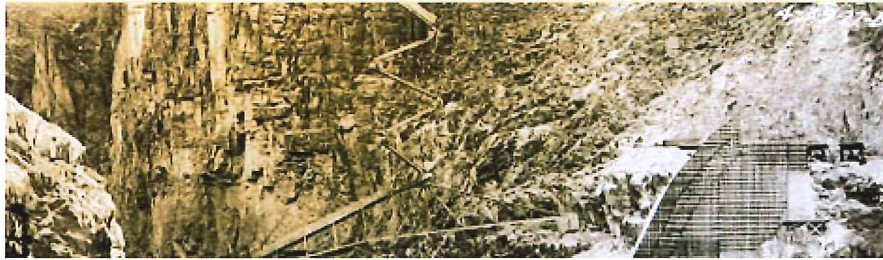
The second dam to be built by the Association was Horse Mesa Dam, located between Mormon Flat and Roosevelt dams. (SRP photograph)



Stewart Mountain Dam was the last dam to be built, completing the Association's decade-long effort to increase power generation. (SRP photograph)



Mormon Flat Dam under construction 1925 (SRP photograph).



Horse Mesa Dam looking downstream, 1927. (SRP photograph)



Construction of Stewart Mountain Dam, 1929. (SRP photograph)

Stewart Mountain Dam construction, 1929. (SRP photograph)

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