History

of the

Salt Lake Aqueduct

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July, 2004

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Early settlers in the Salt Lake Valley found, over the years, that it was very difficult to ensure an adequate water supply to an increasing population. After numerous exchange agreements had been made, it was decided that Salt Lake City needed a better way to plan and develop the water supply for the valley. The State Legislature passed the Metropolitan Water District Act in 1935, which opened the door for the creation of the Metropolitan Water District of Salt Lake City (District).

The District was given the task of securing and developing a firm water supply for Salt Lake City. The Board of Directors (Board) ultimately decided that the best option for Salt Lake City was to participate in the Deer Creek Division of the Provo River Project (Project). This Project consisted of building Deer Creek Reservoir, an earthen dam that would create a water supply and furnish recreation such as fishing, boating, etc. This would solve the problem of obtaining a water supply, but did not provide for a means to get the water to the Salt Lake Valley. The Board decided that their best option was to convince the U.S. Bureau of Reclamation (Bureau) that an aqueduct (a large, buried pipeline) should be included as the Aqueduct Division of the Provo River Project.

District representatives went to Washington D.C. in 1937, and presented their recommendations for including the aqueduct as part of the Project. They met directly with the Secretary of the Interior, who gave them written concurrence a few days later. The Board then called for an election so that taxpayers could determine if they wanted the District to make a commitment to participate in the Deer Creek Project and construct the Salt Lake Aqueduct (Aqueduct). The taxpayers voted in favor of the Project and the Aqueduct. The Board then met with the Bureau to work out the details of the final contract for $5,500,000 to be repaid over 40 years with no interest.

Aqueduct right-of-way work began on November 28, 1939. The Bureau of Reclamation built the Aqueduct during the 1940's, and it was put into service in 1951. The Aqueduct is constructed of concrete pipe with an inside diameter of 69 inches. Each section of pipe is 20 feet in length and weighs 41,300 pounds. Water travels by gravity through the entire length of the Aqueduct.

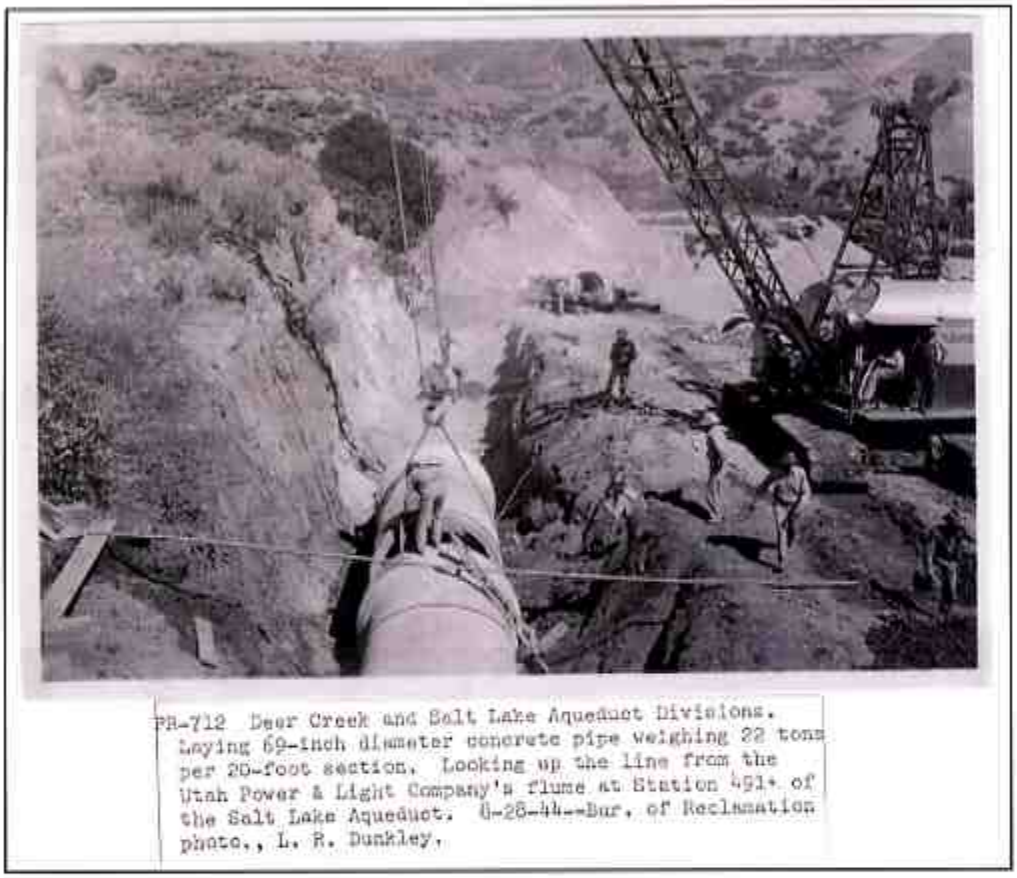
The following pictures were taken during construction of the Aqueduct. Each picture has a self explanatory caption and includes the date the picture was taken. The sequence of the pictures shows the steps taken in constructing the Aqueduct, but dates may not be chronological since pictures may have been taken during the construction of different segments of the Aqueduct. As you view these photos, take note of the equipment used during each phase of construction.

PR-425 Deer Creek and Salt Lake Aqueduct Divisions.
An inadequate water supply was disastrous to a portio
of this orchard. Water from Deer Creek Reservoir on
the Provo River Project will alleviate future losses.
9-12-40--Bur. of Reclamation photo., J. C. Allen.

A-40-60 Placing concrete for 69 inch diameter prestressed concrete pipe. 7-18-40--Bur. of Reclamation photo., M. R. D.

A-60-70 Pipe line. Dumping pipe in plant yard. 8-3-40--Bur. of Reclamation photo., M. R. D.

A-41-69 Lowering 69 inch diameter concrete pipe into place. 8-29-41--Bur. of Reclamation photo., L. R. D.



PR-712 Deer Creek and Salt Lake Aqueduct Divisions. Laying 69-inch diameter concrete pipe weighing 22 tons per 20-foot section. Looking up the line from the Utah Power & Light Company's flume at Station 491+ of the Salt Lake Aqueduct. 6-28-44--Bur. of Reclamation photo., L. R. Dunkley.

A-41-196 Concrete setup, Draper Portal. Batch plant, mixer gun, tanks, and shooting line. 10-24-41--Bur. of Reclamation photo., L. R. D.

A-41-131 Grouting equipment outside jointing operations S.L.A. Upstream Station 573+30. 6-11-41--Bur. of Reclamation photo., L. R. D.

PR-389 Deer Creek and Salt Lake Aqueduct Divisions. Hand tamping backfill around pipe and drainage span structure near Station 998, Salt Lake Aqueduct. 8-9-40--Bur. of Reclamation photo., J. C. Allen.

Chronological Events in the History of the Salt Lake Aqueduct

The following events occurred in 1941 in relation to building the Aqueduct:

- January—high pressure gates were installed and the tunnel plug was placed in the outlet works at Deer Creek Dam, which permitted control of the river flow.

- First week of February—construction work on Deer Creek Dam was suspended due to severe weather conditions.

- February 27—the Utah Concrete Pipe Company completed the manufacturing of all pipe, comprising 2,437 units for the Salt Lake Aqueduct.

- March 17—construction work resumed at Deer Creek Dam.

- September 14—final tests for leakage of the 9.26 miles of pipeline and structure comprising the first unit of the Aqueduct were completed, with water losses being negligible.

- September—government employees were called as witnesses in litigation between Utah Welders, sub-contractors, vs. Robl-Connolly, contractors, concerning field welding of 72-inch diameter outlet pipes at Deer Creek Dam.

Terminal Reservoir, a 40-million-gallon finished water reservoir, was put into service in 1951. Terminal Reservoir is an underground storage tank consisting of two cells, each with 20-million-gallons of storage capacity. Terminal Reservoir is the location where the Salt Lake Aqueduct ends, and is one of the locations where water is delivered to Salt Lake City.

District employees cleaning the inside of Terminal Reservior. The Reservoir must be completely drained in order to clean the inside.

Prior to building the Little Cottonwood Water Treatment Plant (LCWTP), the Salt Lake Aqueduct went directly into Terminal Reservoir. The reservoir provided storage for fire protection and flexibility of water flows to allow for better distribution of water to Salt Lake City.

Initially, chlorination stations were located at Deer Creek Reservoir, to reduce the buildup of organic matter inside the Aqueduct, and at Terminal Reservoir, for disinfection of drinking water. Over time, public expectations for drinking water quality became greater. Thus, the Little Cottonwood Water Treatment Plant (Plant) was built in 1960 to safeguard the health and well-being of the residents of the Salt Lake Valley. The Plant was positioned in line with the Aqueduct such that raw water could enter the Plant and finished water could be transported from the Plant to Terminal Reservoir. The Plant was located at the base of Little Cottonwood Canyon, which created the opportunity to treat both water

from Little Cottonwood Creek or water transported through the Aqueduct from Deer Creek Reservoir *(see attached map)*. The 42-mile long Aqueduct was now comprised of a 33-mile raw water section and a 9-mile finished water section. The raw water section begins at the base of Deer Creek Reservoir, runs down Provo Canyon, and continues north to the Little Cottonwood Water Treatment Plant. The finished water section runs from the Little Cottonwood Water Treatment Plant to the Terminal Reservoir in the Salt Lake Valley *(see attached map)*.

The picture below shows a section of Aqueduct pipe currently on display at the Little Cottonwood Water Treatment Plant.

A section of the Salt Lake Aqueduct Pipe.

In 1969, a section of the Aqueduct was relocated to accommodate the I-215 Freeway. In conjunction with the relocation, an inlet overflow bypass structure was built in anticipation of a 50-million-gallon reservoir being built. Later, it was determined that Salt Lake City did not need this reservoir; therefore, plans to build the reservoir were abandoned.

A. J. Dean, a sand/gravel/concrete company located at 6700 South Wasatch Boulevard, relocated a portion of the Salt Lake Aqueduct in 1986, since the sand and gravel operations had compromised the Aqueduct. It was necessary to move the pipeline so that they could continue with their excavating operations without putting the Aqueduct in jeopardy. A. J. Dean paid for this relocation.

In 1986, the Utah Department of Transportation relocated the Aqueduct at four locations in Provo Canyon and two more locations in 1997 to accommodate roadway improvements.

In prior years, high doses of chlorine had been fed into the Aqueduct to keep the buildup of organic matter from growing inside of the pipe. This practice was discontinued since it created too many disinfection byproducts (compounds formed when disinfectants react with natural organic matter) to maintain water quality standards. Thus, it became necessary to clean the Aqueduct using another method. In April, 1990, under the direction of Flowmore Services

"Pig"

Crane lifting "pig" into "pig" launching structure at Deer Creek Dam.

Company of Houston, Texas, District employees cleaned 30 miles of the raw water portion of the Aqueduct from Deer Creek Reservoir to the Little Cottonwood Water Treatment Plant. This was accomplished by using water pressure to push a polyurethane foam swab (also referred to as a "pig") through the pipe. Plastic brushes imbedded on the "pig" scraped material from the pipe surface. The location of the "pig" was monitored using an electronic transmitter

Brushes on "pig"

and receivers. This was the first time that this portion of the aqueduct had been cleaned since 1955, when a pig was sent through the portion of Aqueduct that ran from the Deer Creek Intake to the Alpine Draper Tunnel *(see attached map)*.

"Pig" entering the Salt Lake Aqueduct

An attempt was also made in 1990 to clean the finished water portion of the Aqueduct (from Little Cottonwood Water Treatment Plant to Terminal Reservoir), however, this attempt failed due to a flow meter (a device that measures water flow) that obstructed the "pig's" path. It was necessary to change to a different type of flow meter that would allow the pig to pass through it. This change was made, and in 1996, District employees cleaned the finished water portion of the Aqueduct. This was the first time that this portion of the Aqueduct had been cleaned since it was put in to service.

The 10-Million-Gallon Reservoir (10 MG) was put into service in 1992. This is an underground reservoir consisting of only one cell. Finished water runs from the Little Cottonwood Water Treatment Plant through the Salt Lake Aqueduct and into this reservoir. From there, it continues through the Salt Lake Aqueduct down to the Terminal Reservoir *(see attached map)*. The 10 MG provides Salt Lake City with needed fire protection for the south end of their distribution system and increases storage capacity.

Reconstruction of the intake structure at Deer Creek Dam was completed in July, 2001. The reconstruction provided a new screen and gate system for controlling flows into the Aqueduct and preventing large volumes of solids and algae from entering the system. The new screens and gates also make it safer to perform maintenance on the system.

On the following page is a picture of the Salt Lake Aqueduct Intake Station at Deer Creek Dam during construction.

Salt Lake Aqueduct Intake at Deer Creek Dam.

In 2004, rehabilitation, replacement, and maintenance of the Aqueduct distribution system have become an increasingly expensive process. It will be more economically feasible for the District to obtain funding for future maintenance if the District held title to the Aqueduct. Therefore, the District is seeking a title transfer from the Federal Government so the appropriate bonding can be obtained to maintain the system. The District has already taken responsibility for maintaining and operating the Aqueduct, and is currently reviewing plans for future modifications that will allow for more proficient maintenance, and strengthen it against potential seismic events.

EXPLANATION

Raw Water Pipeline

Finished Water Pipeline

Tunnel

0 3000 6000

Scale in Feet

METROPOLITAN WATER DISTRICT SALT LAKE & SANDY

SALT LAKE AQUEDUCT

METROPOLITAN WATER DISTRICT OF SALT LAKE & SANDY

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Skoubye, David E. 2004. Personal interviews with the author, July. Metropolitan Water District of Salt Lake & Sandy Engineering Department.

U. S. Bureau of Reclamation photographs. Digital copies obtained from the Denver Office of the U. S. Bureau of Reclamation. These photographs are noted as Bureau of Reclamation photographs in the pictures' captions.

[1] The Salt Lake City Library, J. Willard Marriott Library, Utah State Historical Society History Research Library & Collections, and the Metropolitan Water District of Salt Lake & Sandy all have a copy of the publication *100 Years of Water Development* on file.