

**American Society of Civil Engineers, San Diego Section**  
**Historic Civil Engineering Landmark**  
**SAN DIEGO FLUME**



*Story by Phil Kern, Photos Courtesy Helix Water District*

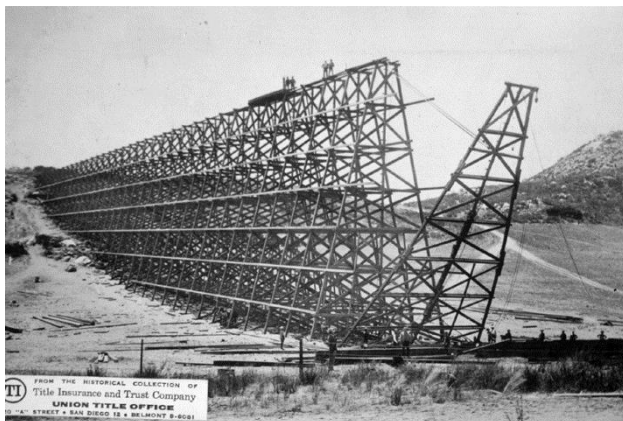
In the late nineteenth century the San Diego area's growth and demand for water was threatening to exceed local supplies, and new sources were needed. Supplies at the time were limited to wells of marginal quality and the unreliable, seasonal flows of local rivers. After several false starts the San Diego Flume Company was capitalized and



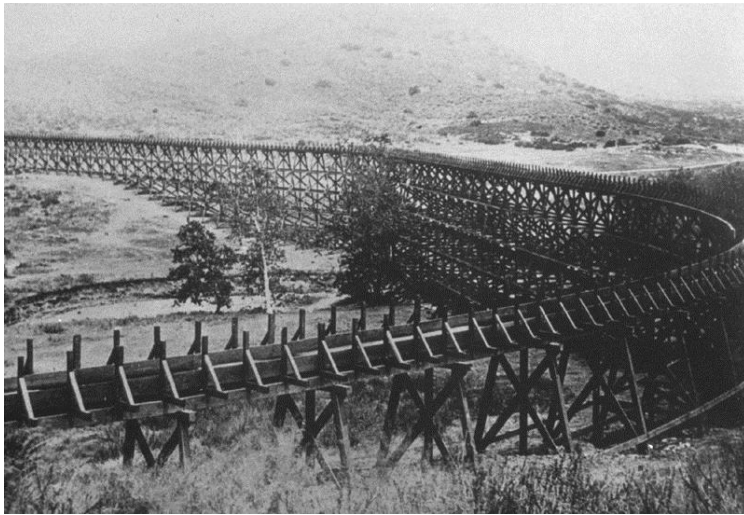
incorporated in May 1886, and began acquiring water rights within the San Diego River watershed. Theodore S. Van Dyke was the engineer for the system, with Joseph W. Sefton, Sr. handling financial responsibilities.

The first major project for the Company was construction of Cuyamaca Reservoir east of San Diego, sited to capture and store runoff from the mountains. The earth fill dam was completed in February 1887 and impounded 8,200 acre-feet. To convey the water to customers a 30+ mile canal system would be needed, to be operated by gravity using only the difference in elevation between Cuyamaca Reservoir and Grossmont Summit.

Water from the Cuyamaca Reservoir was discharged into Boulder Creek and intercepted downstream by a stone diverting dam across the San Diego River, then conveyed through a redwood flume along the hillside east and south of the river down El Monte Valley. Near present day Lake Jennings the flume turned south through a tunnel into Quail Canyon, crossed Los Coches Creek via a large trestle, passed through another longer tunnel into El Cajon Valley and followed the hillsides on the east and south sides of the valley to Grossmont Summit. After 1892, the flume supplied Eucalyptus Reservoir (now Briercrest Park) then flowed through the La Mesa Ditch west to La Mesa Reservoir (now inundated by Lake Murray) for treatment and distribution to the City.



The flume itself was constructed of redwood brought by ships down the coast or towed in huge log rafts by steamers to San Diego Bay, where it was sawn into lumber. Trains of horse drawn wagons delivered the lumber from the docks to the worksites. Reportedly 100 wagons, 800 horses and mules and 1,000 men were employed in this effort alone. Over nine million board feet of



redwood was used in construction of the 33-1/2 mile flume and the 315 trestles required to maintain the constant grade of 4' per mile (0.08%) of the flume. The longest structure was the Los Coches trestle at 1,774 feet long and 65 feet high. The flume itself was six feet wide by 16 inches deep of redwood caulked with hemp and oakum conveying 1,750 miner's inches of water (35 cfs), and for the majority of its length rested on

a ten foot wide earthen bench carved out of the rocky hillsides. A total of eight hard rock tunnels were also required to maintain the mild grade through the ridges and saddles, and were constructed by drill and blast methods by mainly Chinese laborers with the longest being the Lankesheim Tunnel at 1,900 feet long. The quality of the construction was very good, as evidenced by the stone work remaining at the tunnel portals.

Construction was finally completed in late 1888 and water deliveries started in 1889. Opening festivities on February 22<sup>nd</sup> included a parade, 19 honorary presidents of the company on the dais as well as other dignitaries, and two nozzles at Fifth & Beech and Fifth & Ivy were shooting the newly supplied water 125-150 feet in the air. Rides in small flat bottomed boats used for patrolling the flume were also popular. Known as "Shooting the Flume", they were known to feature adult libations, popular songs of the period and were occasionally performed after dark.

The flume required constant monitoring and maintenance, and "flume walkers" lived with their families in houses constructed along the alignment for this purpose. The sheer length of the wooden conduit guaranteed leaks, it was estimated 25-30% of the water was lost through leakage. Normal flow was only a few inches deep, and in many years the flume could be completely dry by summer. The flume had turnouts to serve customers along its length, but had few gates or stoplogs to slow the flow. If maintenance was required a few boards were removed from the side of the flume and the flow allowed to spill into a nearby drainage course. In later years sections of the flume were lined with roofing material, gunite or steel; portions were replaced by "syphons" made of redwood pipe; but it was not completely replaced by modern steel pipelines until 2001. Although the redwood flume and trestles have long since been dismantled, with a short hike remains of the flume alignment and tunnels can still be seen east of Lake Jennings.

