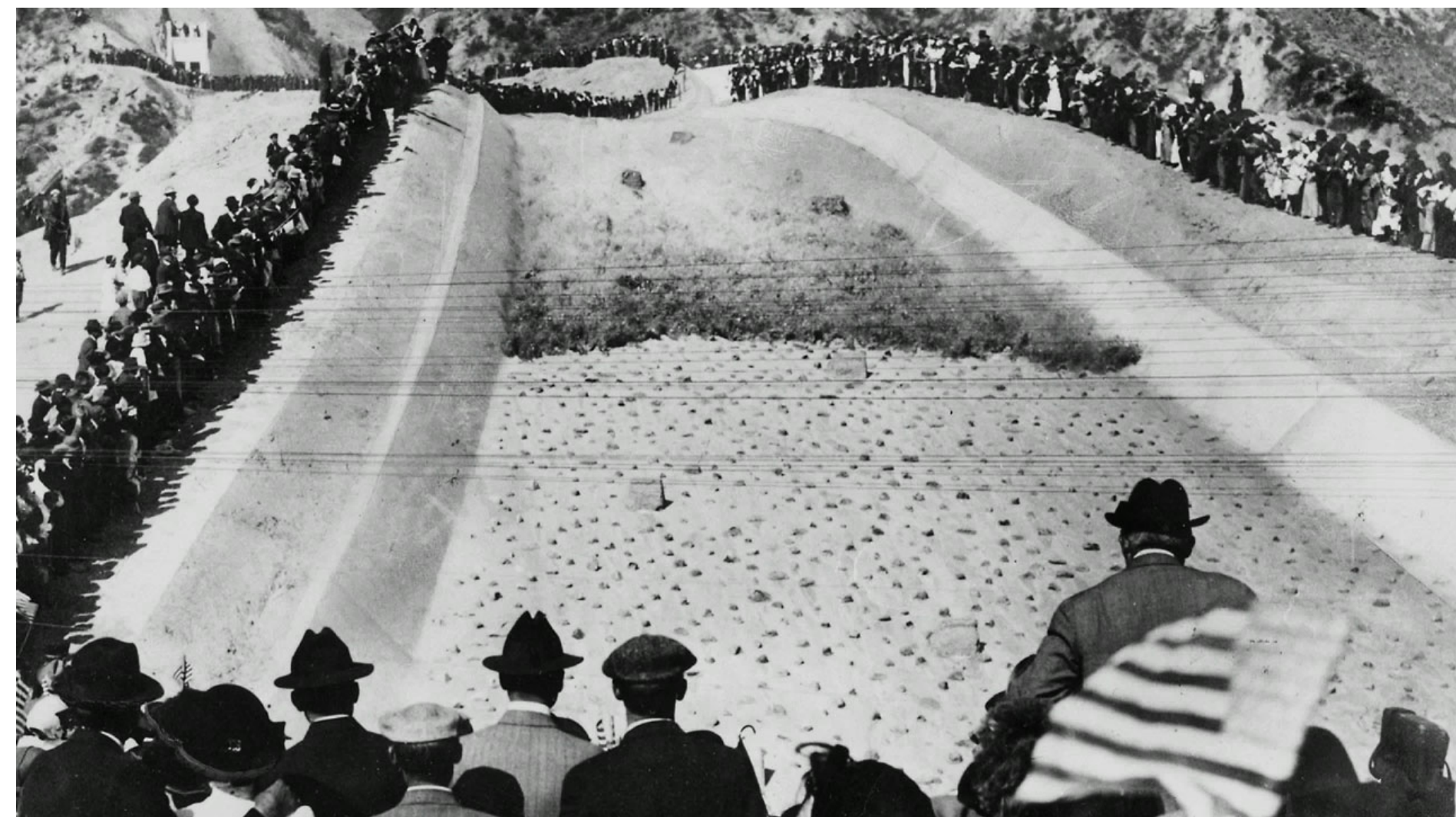


'THERE IT IS — TAKE IT' A century of marvel and controversy

For 100 years, the Los Angeles Aqueduct has delivered water to a thirsty city, wending its way for more than 200 miles from the Owens Valley, through canyons and deserts, down to the modern metropolis. A feat of engineering and a product of political maneuvering, it nurtured the region's growth while leaving conflict in its wake.

By Louis Sahagun, Photos by Brian Van Der Brug

October 28, 2013



Replay intro

Los Angeles Department of Water and Power

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As the morning haze peeled off the northern corner of the San Fernando Valley, Fred Barker walked along remnants of an engineering marvel that transformed a dusty railhead into a metropolis — rusting pipes, wooden walkways and a concrete spout that wound serpent-like down a hillside.

One hundred years ago — Nov. 5, 1913 — 40,000 people gathered on this spot in Sylmar to watch the water arrive for the first time from the Owens Valley.

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Barker, an engineer with the Los Angeles Department of Water and Power, trudged a few yards up the hill.

“This is the exact spot,” he said.

At 1:15 p.m. that day, William Mulholland, the city's chief water engineer, gave a signal, and crews turned two steel wheels, opening gates that sent the first sparkling water into the waiting San Fernando Reservoir.

“There it is — take it,” Mulholland said to the cheering crowd.

It took 5,000 workers five years to complete the \$23-million project, which was excavated with dynamite, hand shovels and mule power in rocky canyons and searing desert expanses.

The job — completed on time and under budget — required 215 miles of road, 280 miles of pipeline, 142 tunnels, more than 1 million barrels of cement and 6 million pounds of dynamite.

Mulholland's prophecy that “whoever brings the water will bring the people” was soon fulfilled.



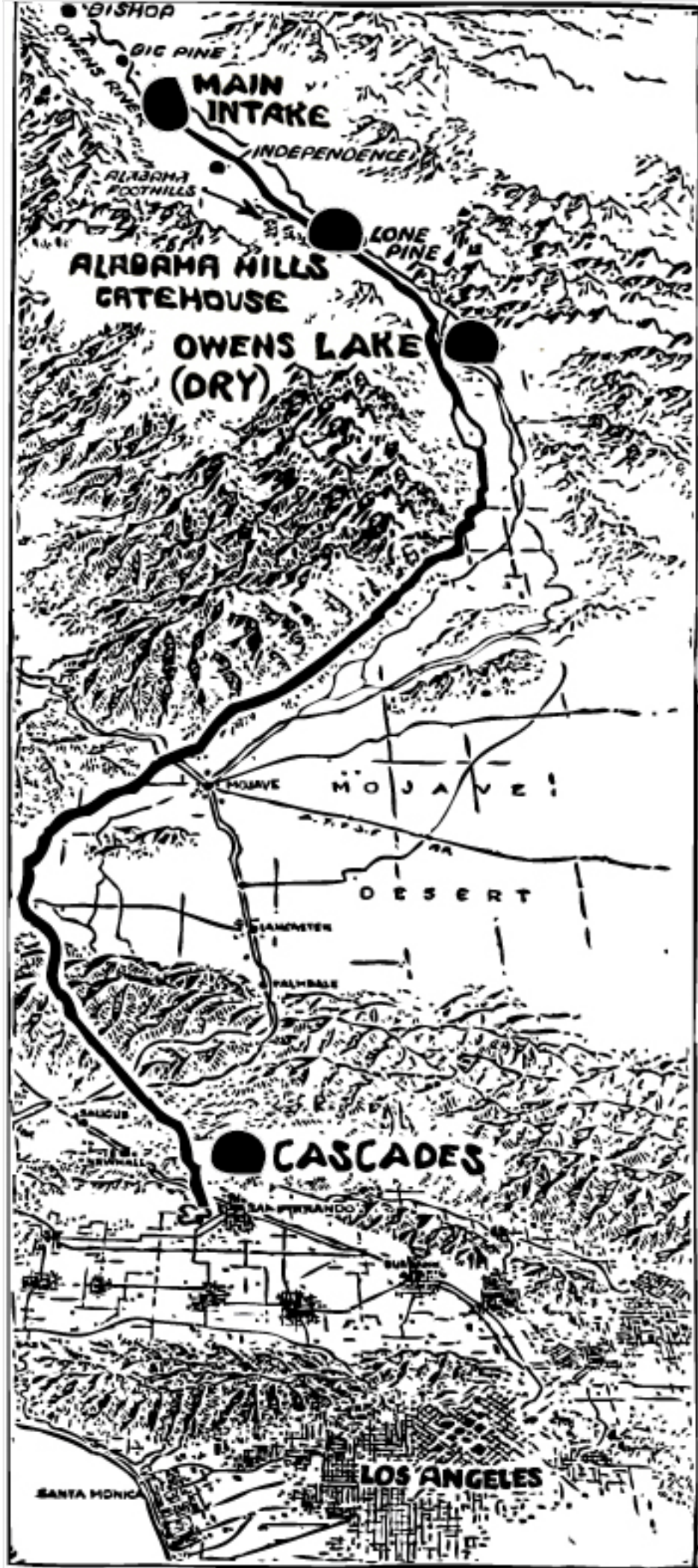
280 miles of pipeline

142 tunnels

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43 men perished during
construction



Los Angeles Times file graphic

The Los Angeles Aqueduct — powered by gravity alone as it tapped the snows of the Sierra Nevada more than 200 miles to the north — ensured reliable irrigation for farms and ranches and nurtured a galaxy of prosperous Southern California suburbs and industrial centers.

Like a magnet, it pulled in millions of people from around the country, offering them new jobs, communities and lifestyles.

In 1913, the city covered 107 square miles. Seven years later, it had expanded to 364 square miles with a population of nearly 800,000. Today, Los Angeles covers 465 square miles with a population of nearly 4 million.

Mulholland's "Big Ditch" also sparked the long conflict between Los Angeles and the Owens Valley.

The stealth and deception used to obtain the region's land and water rights became grist for books and movies that portrayed the dark underbelly of Los Angeles' formative years, and inspired deep-seated suspicions about the city's motives that linger to this day.

The aqueduct left no more water for the 62-mile-long Lower Owens River. It also denied water to the river's massive catch basin, Owens Lake, which evaporated into salt flats prone to choking dust storms.

"The Los Angeles Aqueduct is as much a product of will and innovation as of sneakiness and greed," said Jay Lund, a professor of civil and environmental engineering and director of UC Davis' Center for Watershed Sciences.



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The water begins high in the Sierra Nevada.

Squeezed between those jagged peaks and the less lofty White Mountains, the Owens River ran through a valley inhabited for thousands of years by Paiute Indians. White ranchers and farmers in the late 1800s stole the land and water.



The fathers of the Los Angeles Aqueduct, from left: Joseph B. Lippincott, an engineer; former L.A. Mayor Fred Eaton; and William Mulholland, the city's chief water engineer. [More photos](#)



In 1904, former Los Angeles Mayor Fred Eaton and Mulholland rode a buckboard with a team of mules to the Owens Valley to take a look at its riches.

Mulholland took notes as Eaton regaled him with stories of discoveries he had made during earlier trips to the region. He was confident that an aqueduct from Owens Lake, which sat at 4,000 feet, could deliver water to Los Angeles, roughly 200 miles away, using just gravity.



Mulholland submitted a report to the Board of Water Commissioners in 1905 that concluded that Eaton was right — a system of tunnels, conduits and reservoirs could be built within a period of five years at a cost of about \$23 million.

Construction began in September 1907 on the Elizabeth Tunnel portion of the aqueduct. In the months that followed, work camps sprang up along the route, requiring the construction of more than 2,300 buildings and tent houses for a labor force that peaked at about 3,900 men.

Life in the project's 57 work camps was hard. Workers paid 25 cents per meal out of their daily wages of \$2.25. The crews were a tough mix: Greeks, Italians, Bulgarians, Serbs, Swiss, Mexicans and Native Americans.

In an era when derbies served as hard hats, the men who dug, hacked and blasted the system into existence between 1908 and 1913 risked falls, cave-ins, rock slides, vehicular accidents and falling debris. At least 43 men perished during construction.

The aqueduct was dedicated on Feb. 13, 1913. Bessie Van Norman, wife of Mulholland's right-hand man in the Owens Valley, cracked a ceremonial bottle of Champagne on the system's intake north of Independence in Inyo County.


Los Angeles developed quickly after the water began flowing in November.

No one could have foreseen that within a decade Mulholland would be leading a search for additional supplies to slake the city's unquenchable thirst.

By the early 1920s, tensions seethed in the Owens Valley over the city's continuing acquisitions of land

and water rights. Over the next three years, the aqueduct was dynamited more than a dozen times.



Clockwise, from top: William Mulholland, the city's chief water engineer, speaks at opening ceremonies on Nov. 5, 1913, in Sylmar. Jess Hession, Inyo County district attorney, left, and J. Clark Sellers, a criminologist, examine dynamite found near the aqueduct after a section of pipe at No Name Canyon was blown up in May 1927. The explosion destroyed 400 feet of pipe. [More photos](#) 

In the 1930s, Los Angeles extended the aqueduct's reach by 150 miles to include runoff from five streams in Mono Basin. That diversion system begins at the Lee Vining Intake, about 7,000 feet above sea level, not far from the east entrance to Yosemite National Park.

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The Second Los Angeles Aqueduct opened in 1970. Beginning just south of Owens Lake, it added 50% more capacity to the water system.

The two Los Angeles aqueducts began delivering about 430 million gallons a day to the city.

In 1976, the DWP announced plans to increase pumping from the Owens Valley's subterranean water table.

The move further sharpened the conflict between Los Angeles and the Owens Valley, whose residents complained of environmental damage from all the pumping.

On Sept. 15, 1976, a dynamite blast ripped apart one of the Alabama Hills gatehouse's five gates, flushing 100 million gallons of water into the valley floor.

Critics say the DWP has been painfully slow to address the environmental effects of its activities in the Owens Valley.

It took a court order to force the DWP to restore water to the Lower Owens River, as required under a

2003 agreement to stop environmental damage caused by the city's groundwater pumping.

On a recent weekday, DWP biologist Brian Tillemans pushed through a thicket of tules and slid his kayak into the rejuvenated river, which flows through a serene expanse of carefully manipulated wetlands, oxbows and pasturelands framed by the snaggletooth Sierra.

The only sounds were the chattering of yellow-headed blackbirds and the soft splashes of his paddles digging into the cold water. Squadrons of white pelicans and white-faced ibises flapped overhead.

“Because of the aqueduct,” Tillemans said, “many people see the Owens Valley as California's last wilderness.”

A few miles downstream, however, dust storms on dry Owens Lake continue to exceed the federal standard for harmful airborne particulates, resulting in the issuance of local health alerts.

The DWP has spent \$1.2 billion on vegetation, gravel and flooding of Owens Lake that has reduced dust pollution by 90%. In 2010, the Great Basin Unified Air Pollution Control District, a state agency, ordered Los Angeles to control dust on an additional 2.9 square miles of lake bed, a job that could cost ratepayers \$400 million.

The dispute is far from over. On a recent morning, Ted Schade, Great Basin's enforcement officer, reached down and lifted a handful of sand at the edge of the eerily flat alkaline lake bed.

“If Los Angeles hadn't taken the water from one of the largest natural lakes in California, we wouldn't see all this sand,” he said.

“If the aqueduct had never been built, the city would never have grown larger than about 300,000 people.” — Marty Adams, DWP water systems manager

Over the decades, the prominence of the Los Angeles Aqueduct system has diminished. There are longer aqueducts now linked to the Colorado River. In a typical year, Los Angeles gets more than 50% of its water from the Metropolitan Water District; this year, it draws only 13% of its water from the system. For the first 90 years of its existence, it met more than 60% of the city's demands.

Rising temperatures have taken a toll on what once seemed to be boundless supplies of Sierra Nevada snowpack. Today, the water flowing down the aqueduct system is at the lowest level ever recorded, and almost all of it is being directed onto dry Owens Lake to meet federal air pollution standards.

Still, the system continues to serve as an important safety net for Los Angeles.

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Aerial aqueduct: Take the video tour

Gazing out the window of a helicopter hovering above its intake structure on the Owens River, about 250 miles north of Los Angeles, DWP water systems manager Marty Adams said, “If the aqueduct had never been built, the city would never have grown larger than about 300,000 people.”

Adams is still amazed that the system was constructed at all.

“It's a long straw from here to Los Angeles,” Adams said. “For being 100 years old, it's still in pretty good shape.”

But the system is starting to show signs of age. At least 65% of the system's pipes are more than 50 years old, and upgrading them is a priority for the DWP.

This year, a 5-mile-long stretch was drained to allow the replacement of cracked and bulging sections of century-old concrete. The system's 12 hydroelectric power generation stations are being overhauled with improved wiring and parts.

The utility plans to upgrade a stretch spanning the San Andreas Fault with a flexible plastic pipeline capable of continuing to carry emergency supplies of water in the event the aqueduct is severed by a catastrophic earthquake.

“It will continue to serve the city for another 100 years,” Adams said, “and, with maintenance, a lot longer than that.”

For the Record, Oct. 28: An earlier version of this online article said that Los Angeles gets more than 80% of its water from the Metropolitan Water District. The article has been updated to note that the correct figure, in a typical year, is more than 50%.

[Contact the reporter](#)

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Additional credits: Web Producer, Armand Emamdjomeh | Digital Design Director, Stephanie Ferrell

Aerial view of downtown Los Angeles and Echo Park. (Don Kelsen / Los Angeles Times)