

2024 – 2025



Civil Grand Jury

Final Report

**Water Rates for the City of Ventura
and
The Underground Dam
in Foster Park**

May 2, 2025

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Water Rates for the City of Ventura and the Underground Dam in Foster Park

SUMMARY

The City of Ventura supplies water to its residents from three main sources: the Ventura River, Lake Casitas, and three groundwater sources.

In the early 1900s, an underground dam was built across the Ventura River in Foster Park to supply water to the growing city of Ventura. However, construction of the dam was halted about 300 feet short of the design due to the increasing depth of bedrock and rising inflow of groundwater.

A study conducted in 1996 found that approximately 485 acre-feet of groundwater escapes from around the end of the unfinished dam during the driest years and could be recovered by completing the dam.

The consultant who prepared the Water Rate Study in 2021 allocated all available water from the Ventura River to the residential water rate. Water from the Ventura River is the least expensive and of the highest quality among the city's water sources.

Completing the underground dam in Foster Park would add surface flow to the river, provide high-quality, low-cost water to the city's supply, lower residential water rates, and improve fish habitats.

The 2024-2025 Civil Grand Jury recommends completing the underground dam across the Ventura River in Foster Park, if feasible.

METHODOLOGY

The Civil Grand Jury interviewed senior officials of the Ventura City Government. Additionally, they reviewed publicly available information, including newspaper articles, city-commissioned studies, and Ventura Water Commission agendas and minutes presentations.

BACKGROUND

Ventura County Power Company began construction of an underground dam in the early 1900s across the Ventura River at Casitas Narrows in Foster Park. An underground dam is designed to block the flow of water below the surface, redirecting the water to the surface. (Ref-01)

Underground dams have been constructed globally to enhance water supply. (Att-01)

Construction of the Foster Park Dam began on the west side of the river and extended 973 feet across the channel to the east. The structure varied in depth from six feet on the west side to 40 feet, depending on how deep the bedrock was beneath the sand and gravel riverbed. The project was never fully completed due to rising costs and construction challenges related to the deep bedrock. A 300-foot gap remains at the eastern end. The exact date when construction of

the dam ended is not known but is thought to be between 1907 and 1911, based on available sources. (Ref-01, Ref-02)

The Ventura City Engineer prepared a drawing in 1924 that details the eastern end of the underground dam along with dimensions corresponding to existing wells. The Southern Pacific Railroad (S.P.R.R.) right-of-way shown on the drawing is now known as the Ojai Valley Trail. (Att-02)

DISCUSSION

In December 1996, Fugro West, Inc. conducted a study of the Ventura River for the Ventura Avenue Treatment Plant/Foster Park Master Plan. This study examines the geology of the river channel and provides a history of floods and droughts. The underground dam does not span the entire width of the river channel. Reportedly, the dam was not completed due to construction challenges arising from the increased depth to bedrock, which the engineer at the time estimated could be as deep as 150 feet. Groundwater flows that exceeded pumping capacity also contributed to the construction difficulties. At the time of this study, the crest of the underground dam was exposed above the active channel due to flood erosion. (Ref-03, Att-03, Att-04, Att-05)

Fugro West, Inc. employed geophysical techniques, including pulse-EKKO radar, to define the geometry of the sand and gravel riverbed in the Foster Park area and to assist in assessing subsurface conditions near the unfinished segment of the underground dam. The cross-section of the river canyon at the underground dam revealed that the bedrock extended only to a depth of 50 feet, instead of the projected 150 feet when construction of the dam halted in the early 1900s. This indicates that completing the dam will be easier than anticipated back in 1907. (Ref-03, Att-06)

A computer model of water production from the river under various conditions, developed for the Fugro West, Inc. report in 1996, conducted a simulation to optimize well production during a dry year (specifically 1990) if the underground dam were extended across Foster Park. The simulation showed that an additional 485 acre-feet per year (over 158 million gallons) would be available in the driest years by blocking the groundwater currently flowing around the end of the incomplete dam and directing it to the surface. The simulation assumed that no surface flow from the river occurred throughout the entire modeling period. (Ref-03)

The Fugro West, Inc. study assessed the completion of the underground dam using a grout curtain, with an estimated cost of \$1,000,000 (1996 cost). A grout curtain consists of a series of adjacent vertical columns of concrete grout injected into the sand and gravel of the riverbed to form an underground dam. The report concluded that the additional water supply would not justify the expense of completing the dam at that time. (Ref-03, Att-07)

Modern techniques for creating underground grout curtains, such as jet grouting, utilizing smaller and more widely spaced drill holes, and high-pressure grout injection with air. This method works very well in porous materials like riverbed sand and gravel, producing wide columns. Completing the dam with 10-foot column spacing and a depth of 50 feet to bedrock

would require 1,500 feet of vertical grouting, costing around \$100,000 (in 2013 dollars), which includes transportation and setup. (Ref-03, Att-07)

The upper two feet of the underground dam are exposed due to river flooding, which creates a potential obstacle for fish passage. A grant-funded fish passage notch was built into the top of the dam to facilitate fish movement. Following the 2023 flooding of the Ventura River, the riverbed's elevation in the Upper Ventura River increased by about four feet, due to sediments washed down from the Thomas Fire burn scar. In contrast, the riverbed elevation in the Lower Ventura River decreased by about two feet. Over time, sediment from the upper river will wash down and re-cover the underground dam in Foster Park, restoring unrestricted fish passage. Litigation against the City of Ventura to protect fish habitat led to an agreement to turn off pumps in Foster Park when surface flows in the river drop to a specified level. Completing the underground dam and directing groundwater currently flowing around the dam to the surface will enhance fish habitat. (Ref-04, Att-08)

The Ventura River historically provided a third of Ventura's water supply until flood damage affected wells and the raw water intake in Foster Park in 2005. The Ventura River is the highest quality and lowest-cost option among the three water sources supplying Ventura. The other sources include the Casitas Municipal Water District (Lake Casitas) and three groundwater basins. The decrease in water production from the Ventura River results from drought, flood damage to pumping facilities, and lawsuits that limit production to protect fish habitats. (Ref-05) Based on recent years of water production from the Ventura River, only 1,573 acre-feet were utilized in the 2021 Water Rate Study. (Ref-05, Att-08)

The 2021 Water Rate Design Study allocated all available Ventura River water to the Residential Water Rates, with the remaining residential demand supplied by more expensive sources. This process resulted in the lowest possible Residential Water Rates. (Ref-05)

A comparison of water rates in Ventura County is attached. (Att-09)

Completing the underground dam in Foster Park would increase surface flow to the river, providing the city with more high-quality, low-cost water. This improvement would lower residential water rates and enhance fish habitats. Water rates are determined by a weighted average of various sources and costs of water supplies. The least expensive and highest quality source is the Ventura River. When the available flows from the Ventura River are insufficient to meet demand, the city contracts water from the Casitas Municipal Water District, which incurs a higher cost. Groundwater basins are the most expensive water source and are used to satisfy the remaining water demand. (Ref-03)

FINDINGS

F-01. The Civil Grand Jury finds that the incomplete underground dam in Foster Park has resulted in a 300-foot gap at the east end, allowing a significant amount of groundwater to flow through.

F-02. The Civil Grand Jury finds that the amount of water produced from the Ventura River for use in Ventura has decreased from one-third of the total demand before 2004 to only 10% in 2021, due to drought, flood damage to wells and water intake facilities, and litigation aimed at protecting fish habitat.

F-03. The Civil Grand Jury finds that the consultant for the 2021 Water Rate Study assigned all available water from the Ventura River to the rate calculation, resulting in the lowest possible water rate. Since dam construction will not be completed for some time and the rate study is currently underway, the improved river water production expected from the completion of the dam, which could benefit the water rate, will not be reflected in the ongoing rate study process.

RECOMMENDATIONS

R-01. The Civil Grand Jury recommends that the City of Ventura conduct a feasibility study to complete the final 300 feet of the underground dam in Foster Park by December 31, 2025.

R-02. The Civil Grand Jury recommends that the City of Ventura complete construction of the underground dam in Foster Park, if it is determined to be feasible, by December 31, 2026.

R-03. The Civil Grand Jury recommends that the City of Ventura repair the flood-damaged wells and water intake facilities in Foster Park by December 31, 2025.

RESPONSES

Responses are invited from:

The following appointed officer within 60 days:

Ventura Water Manager (F-01, F-02, F-03, R-01, R-02, R-03)

Responses are required from:

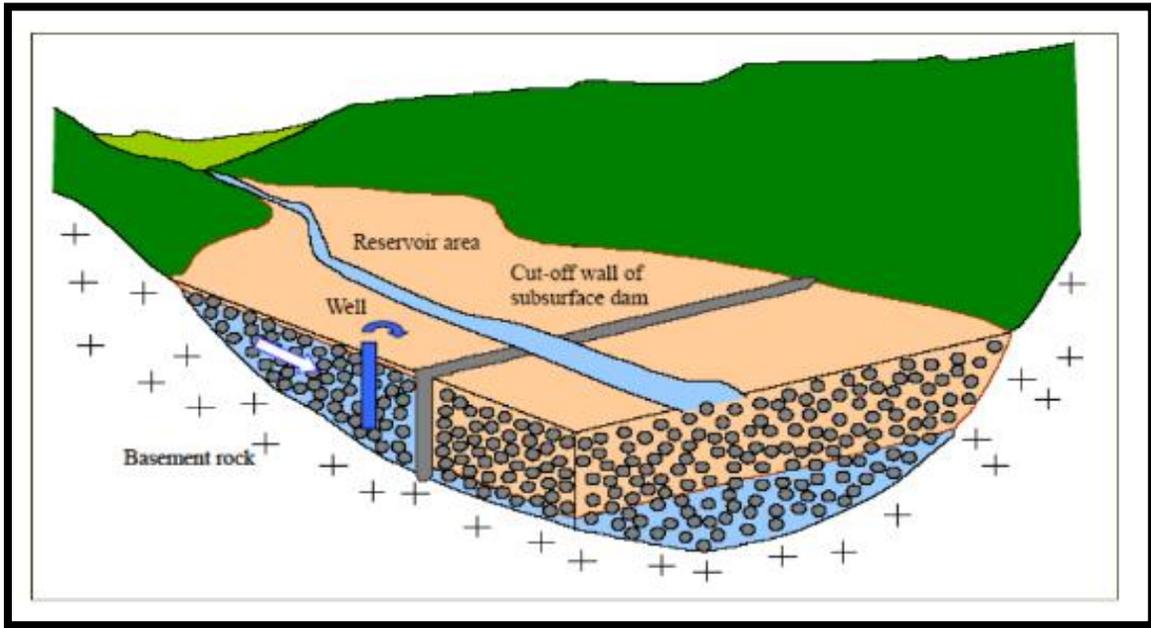
The following governing body within 90 days:

Ventura City Council (F-01, F-02, F-03, R-01, R-02, R-03)

REFERENCES

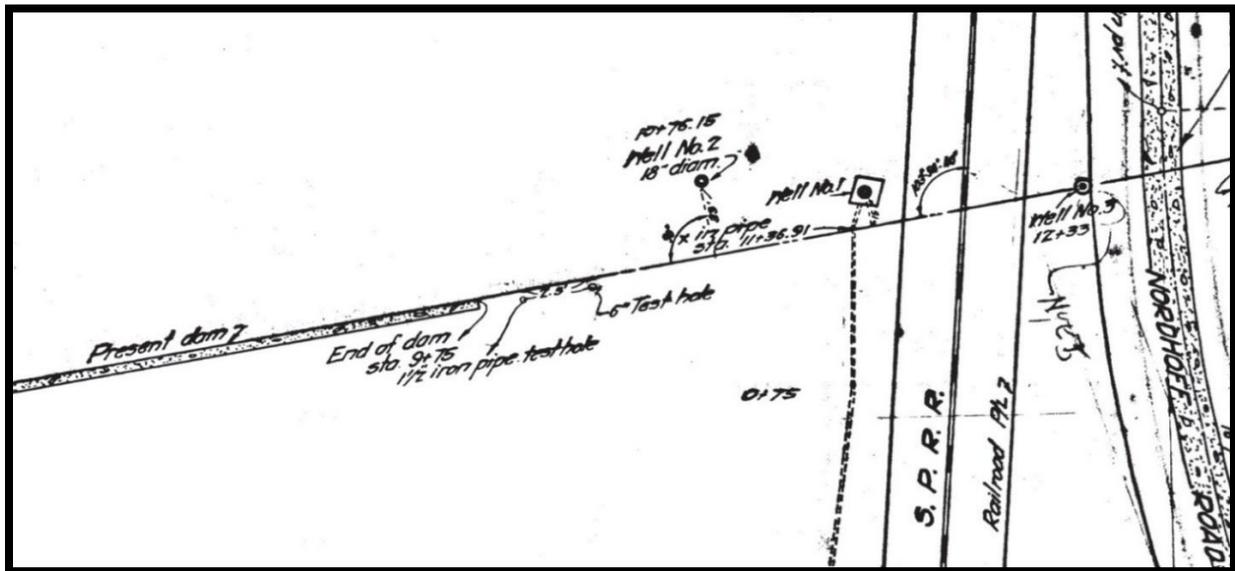
- Ref-01.** Pierce, M.A. (2015). *Documentary History of American Water-Works*. Retrieved on November 12, 2024, from <http://www.waterworkshistory.us/CA/Ventura/>
- Ref-02.** San Buenaventura Research Associates. (2002, Revised 2003). *Historic Resources Evaluation Avenue Water Treatment Plant, Ventura, California*. URS Corporation. *Documentary History of American Water-Works*. Retrieved on March 20, 2025, from <http://www.waterworkshistory.us/CA/Ventura/2002HistoricalSetting.pdf>
- Ref-03.** Fugro West, Inc. (1996, December). *Hydrogeologic Study for the Ventura Avenue Treatment Plant/ Foster Park Master Plan Ventura County, California* (pp. 5, 17, 20, 22). City of San Buenaventura, California. On Behalf of: Kennedy/Jenks Consultants. Retrieved on March 1, 2025, from [1996-Hydrogeologic-Study-for-the-Ventura-Avenue-Treatment-Plant--Foster-Park-Master-Plan-](http://www.waterworkshistory.us/CA/Ventura/1996-Hydrogeologic-Study-for-the-Ventura-Avenue-Treatment-Plant--Foster-Park-Master-Plan-)
- Ref-04.** Jenkin, P. (2024, July 16). *Riverbed changes after 2023 flood*. Ventura River Ecosystem. Retrieved on November 13, 2024, from <https://www.venturariver.org/2024/07/riverbed-changes-after-2023-flood.html>
- Ref-05.** Raftelis. (2021). *Ventura Water 2021 Water and Wastewater Cost of Service and Rate Design Study* (P.70). Ventura Water. Retrieved on March 20, 2025, from <https://www.cityofventura.ca.gov/DocumentCenter/View/26850/2021-Cost-of-Service-and-Rate-Design-Study-Report>

ATTACHMENTS



Att-01

Example of Underground Dams Showing Water Held Back in Riverbed Above Dam



Att-02

Ventura Water: Gap at end of Dam

1924 City Engineer Drawing / Ventura Water Department

ATTACHMENTS – continued



Att-03
Underground Dam Location
Google Earth Project
(Retrieved on March 7, 2025)



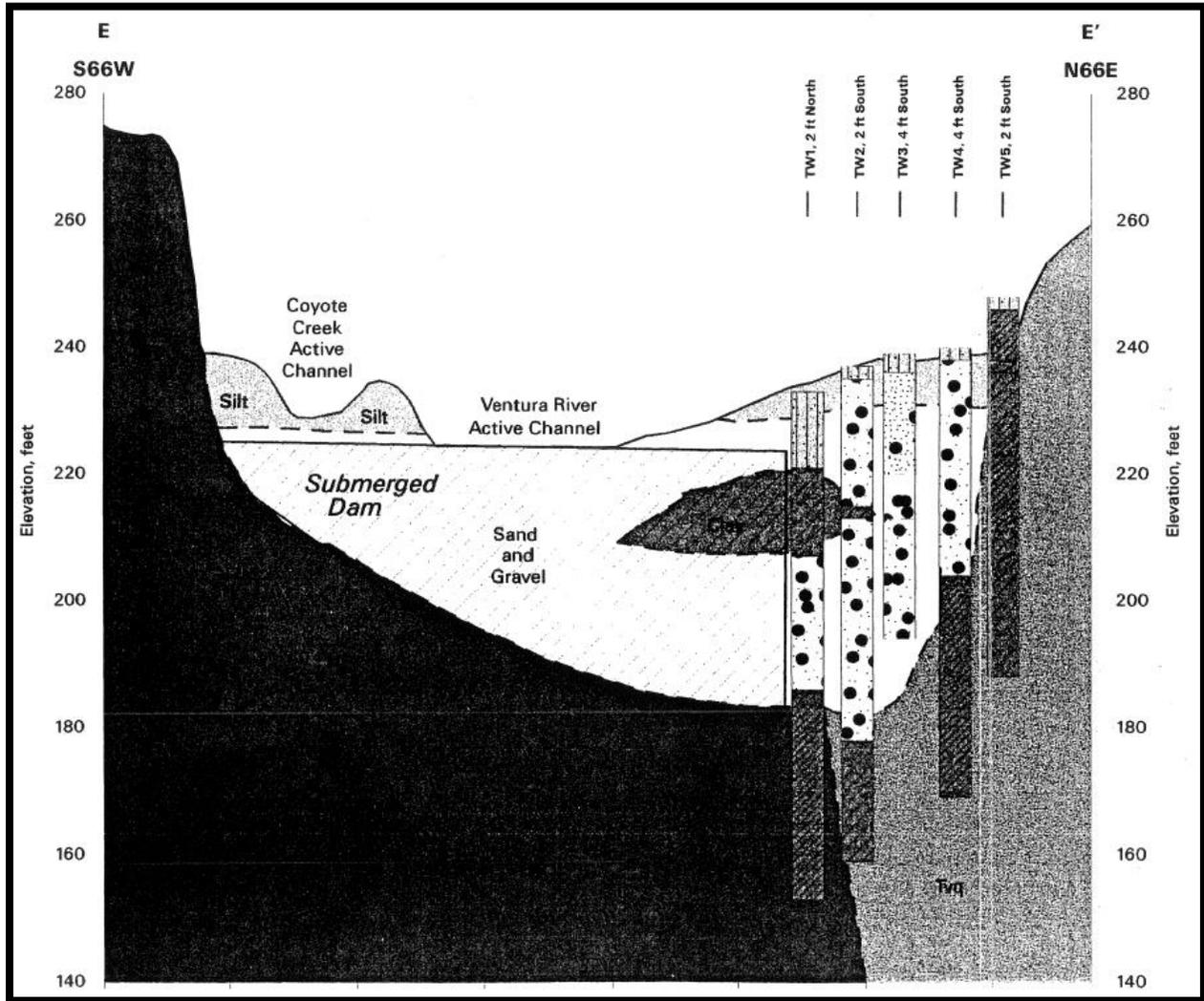
Att-04
Exposed portion of Underground Dam with
Fish Bypass in Foster Park
Civil Grand Jury Photograph taken on October 31, 2024

ATTACHMENTS – continued



Att-05
Overview of 300-foot Dam Extension
Google Earth Project
(Retrieved on October 31, 2025)

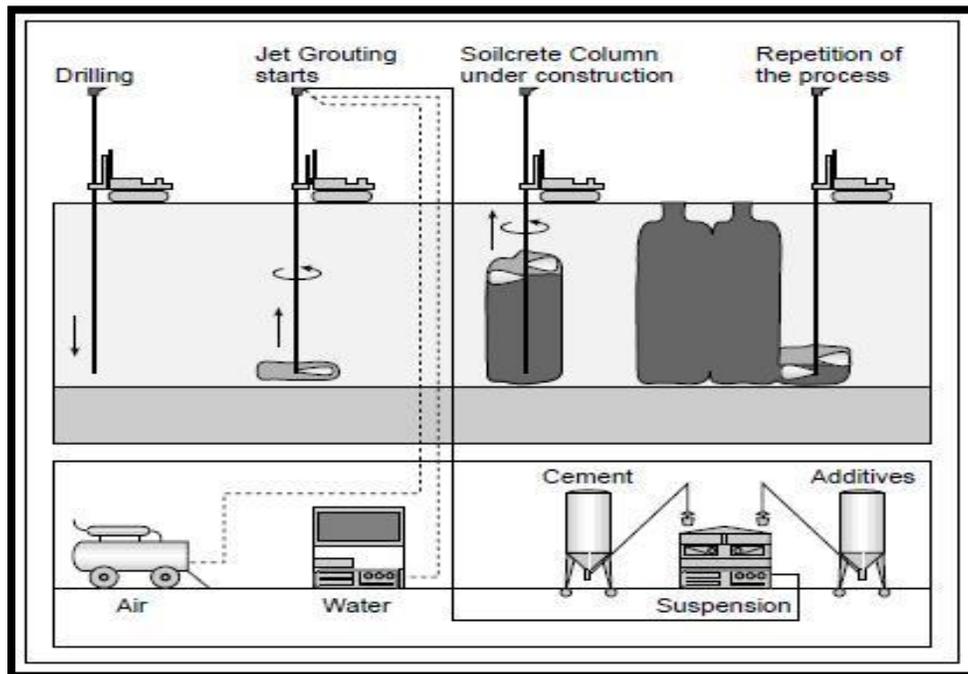
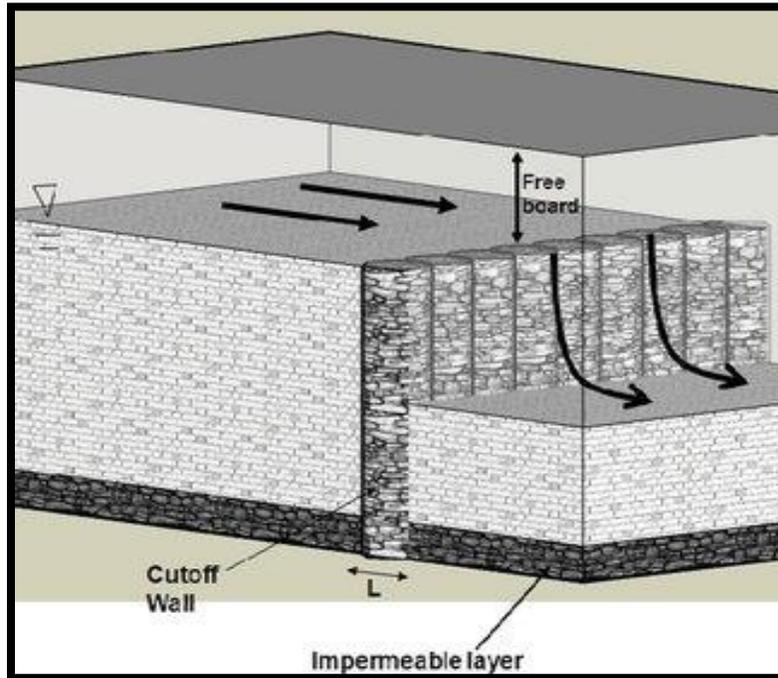
ATTACHMENTS – continued



Att-06

Geological Cross-Section of Submerged Dam at Foster Park
1996 Fugro West, Inc. Hydrogeologic Study for the
Ventura Avenue Treatment Plant/Foster Park Master Plan Plate 8
(Retrieved on March 1, 2025)

ATTACHMENTS – continued



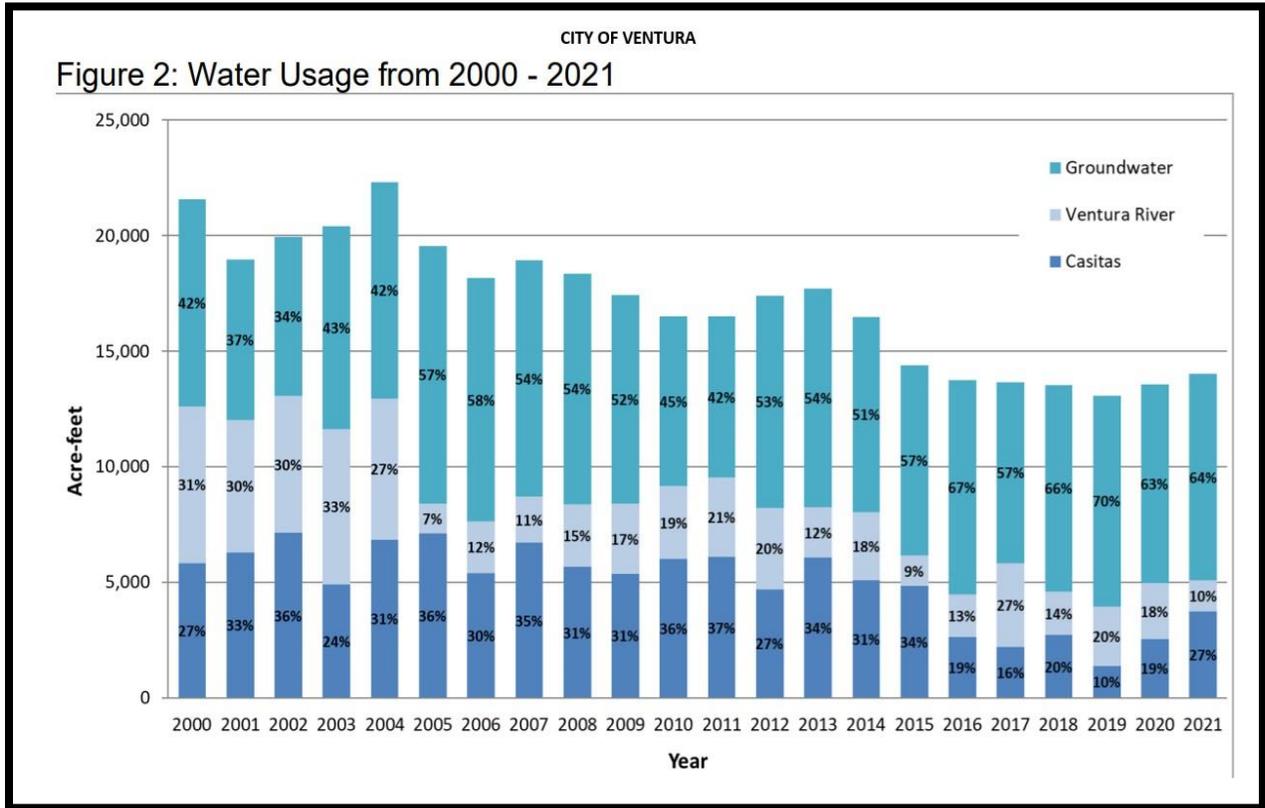
Att-07

Jet Grout Cutoff Wall

<https://www.geoengineer.org/education/web-class-projects/cee-549-geoenvironmental-engineering-winter-2013/assignments/impermeable-barriers>

International Information Center for Geotechnical Engineers
(Retrieved on October 31, 2024)

ATTACHMENTS – continued



Att-08

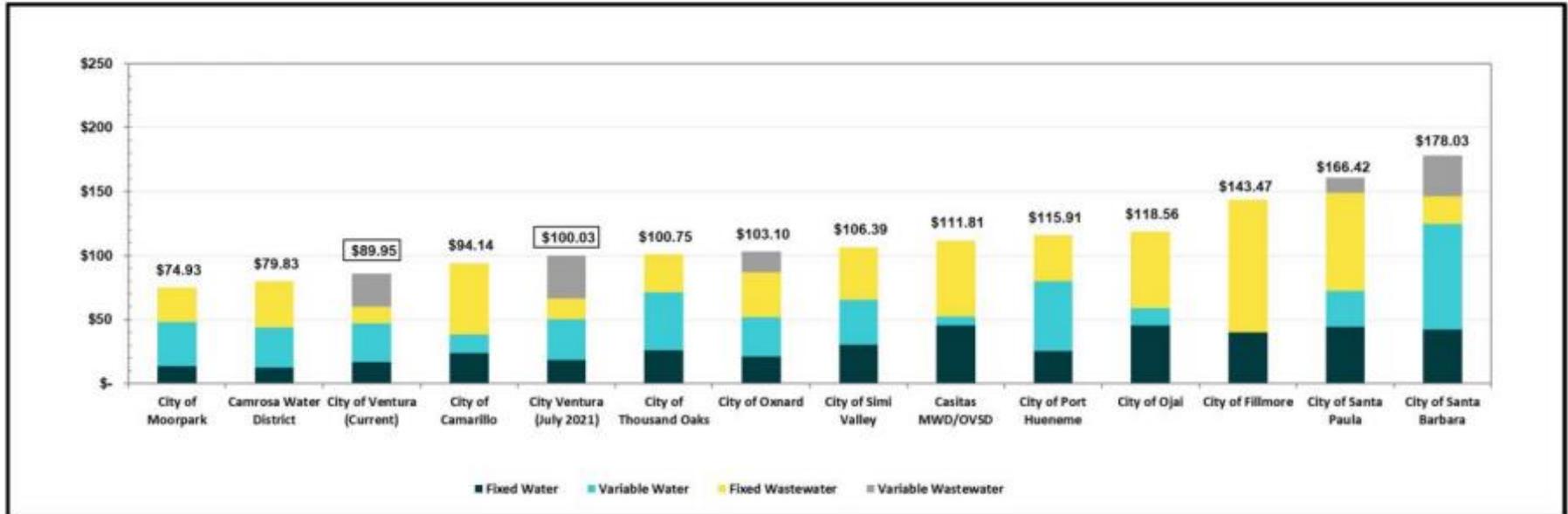
Ventura Water 2024. Water Supply Update.

<https://www.cityofventura.ca.gov/DocumentCenter/View/41635/Agenda-Item-04---Net-Zero-Fee-Repeal-and-Water-Supply-Update>

(Retrieved on October 31, 2024)

ATTACHMENTS – continued

Figure 1-12: Combined Monthly Bill Comparison for Single Family Residential (9 HCF/Month)



Att-09

Ventura Water 2021. Water and Wastewater Cost of Service and Rate Design Study
 Final Report/March 16, 2021. Ventura Water/ Raftelis

<https://www.cityofventura.ca.gov/DocumentCenter/View/26850/2021-Cost-of-Service-and-Rate-Design-Study-Report>

(Retrieved on October 31, 2024)