

OptiFacts



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Water Systems Optimization

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Imported Water Integration Study

Optimization of San Antonio Water System's (SAWS) Water Treatment Plant

THIS CHALLENGING PROJECT required a design to allow a constant flow of 60 million gallons per day (MGD) of new source water into an existing city network. The critical scenario was minimum demand, when it would be most difficult to integrate that large supply volume.

KEY POINTS

- Reduce current dependence on primary ground water source
- Integrate up to 60 MGD of imported water into distribution system
- Determine lowest cost scheme and flexible operating strategy

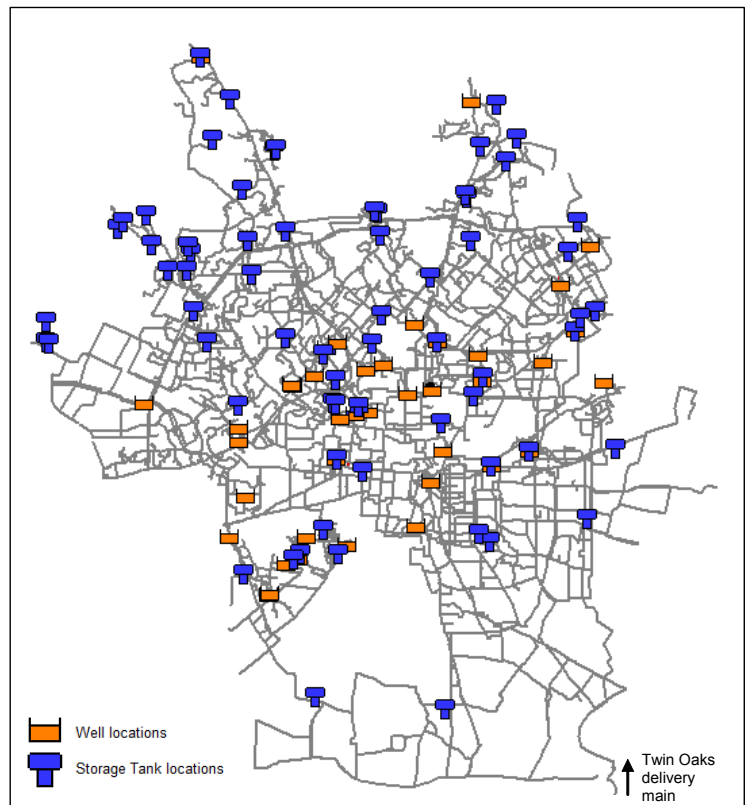
Background

The San Antonio Water System (SAWS) provides water to approximately 1.2 million people in its service area in south central Texas. Steady growth is expected over the next 15-20 years. The SAWS has historically been supplied from wells tapping the local Edwards Aquifer. In recent years, withdrawal restrictions have been instituted for this aquifer, prompting the SAWS and neighboring water suppliers to develop additional supplies to meet future growth.

The Project

The SAWS recently constructed the Twin Oaks Water Treatment Plant in the far southeast corner of its service territory. The plant treats imported Carrizo Aquifer water and pumps it north to the Seale Pump Station via a new 60-inch diameter main. This non-Edwards Aquifer water is then delivered to two other primary stations and distributed through the system.

The SAWS has been successful in integrating approximately 30 MGD from the Twin Oaks facility into the system, but has a goal of consistently integrating up to 60 MGD to meet projected system growth and to offset their use and dependence upon the Edwards Aquifer in times of



SAWS - System pressure zones, Edwards Aquifer well locations and storage tank locations

drought. The existing system is not designed for significant transfer of flow.

In addition, the Twin Oaks facility water is delivered to the east side of the system, while most of the growth is occurring to the north and west. New infrastructure is needed in selected areas of the network in

order to convey this substantial increase in non-Edwards water to meet demands.

Client Reference:

Jeff Haby
Project Manager
San Antonio Water System
2800 U.S. Highway 281 North
San Antonio, Texas 78298
Telephone: 210-704-7297

Key Outcomes

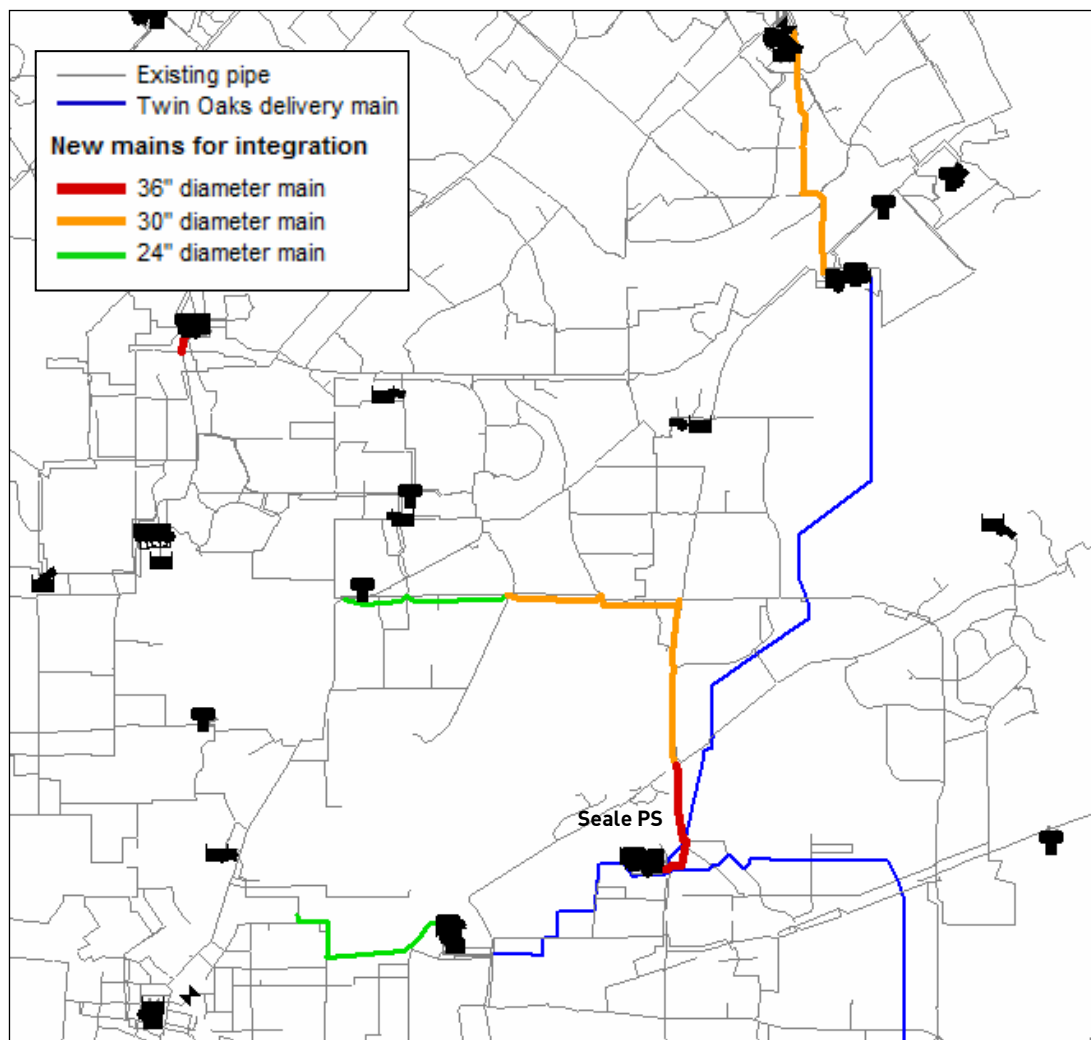
The overall objective was to identify for SAWS an optimal set of system improvements as well as a flexible operating strategy that will allow them to integrate 60 MGD of Twin Oaks facility water to supplement Edwards Aquifer water. The critical demand scenario simulated with the Optimatics GA (OGA) was the projected 2013 minimum day, viewed as the most challenging scenario to integrate the water.

Benefits

Using the OGA, Optimatics successfully identified a hydraulically-viable, low-cost solution of capital improvements and operational strategy for integrating a steady 60 MGD of Twin Oaks facility water. New pipes were recommended near and between five primary stations. New pumps at two primary stations and several new control valves were also part of the solution. Under this improvement scheme, a significant reduction in the use of

Edwards Aquifer water was achieved.

The total estimated capital cost of their preferred solution was \$32 million, which SAWS agreed was a low-cost result for this challenging problem.



Detail of capital improvements recommended in Optimatics' integration solution