

CASE STUDY

# CITY OF SAN LUIS OBISPO

The City of San Luis Obispo Utilizes PAX TRS™ THM Removal System to Remove Approximately 50% of Trihalomethane (THM) Species in 2 Million-Gallon Clearwell



## OVERVIEW

Scenic San Luis Obispo (SLO) is located in California’s Central Coast and boasts a mild climate moderated by the nearby Pacific Ocean. Known for creating an eclectic downtown, the 50,000 or so residents enjoy all that the area has to offer.

Behind the scenes, the City’s water utility operators work to provide the City high quality water by managing a 16 million-gallon-per day (MGD) water treatment plant. This plant utilizes advanced treatment techniques such as primary disinfection with ozone and ballasted-flocculation in addition to traditional filtration. City crews use a variety of operational tactics to maintain water quality such as flushing programs and systematic valve exercising.

The City’s distribution system is quite expansive. It includes over 150 miles of distribution piping that is often being updated as part of the City’s ongoing pipeline replacement projects.

*SLO’s water treatment plant is capable of treating 16 million gallons of water per day, or nearly 1.76 billion gallons of water each year.*

## SITUATION

The San Luis Obispo Water Treatment Plant receives water from three different reservoirs which can lead to varying levels of naturally occurring organic material (NOM) in the feedwater. While the primary water disinfection is done with ozone, secondary disinfection is achieved with free-chlorine, which can react with NOM to create disinfection byproducts such as trihalomethanes (THMs).

As, water age increases, THM formation naturally progresses. (Water age refers to the time from water treatment in a plant to ultimate use.) THMs can be removed by a process known as air-stripping as they are volatile compounds – meaning that they can be readily moved from the water (liquid phase) into air (gas phase) with the application of carefully calculated mixing energy and adequate tank-headspace ventilation.

2 MG Clearwell #2 Tank



Water utility operators closely monitor their system's running THM average against the violation level of 80 parts per-billion (ppb) set by the US EPA.

## APPROACH

After thorough analysis, it was concluded that aeration as a THM mitigation strategy would work.

The best location to implement the PAX TRS™ system would be in Clearwell #2 - a 2-million-gallon tank with very short detention times (often flows of up to 5 MGD).

It was felt that Clearwell #2 location was quite early in the distribution network and if THMs could be lowered significantly in that tank, the entire THM formation curve for the system could be shifted downward.

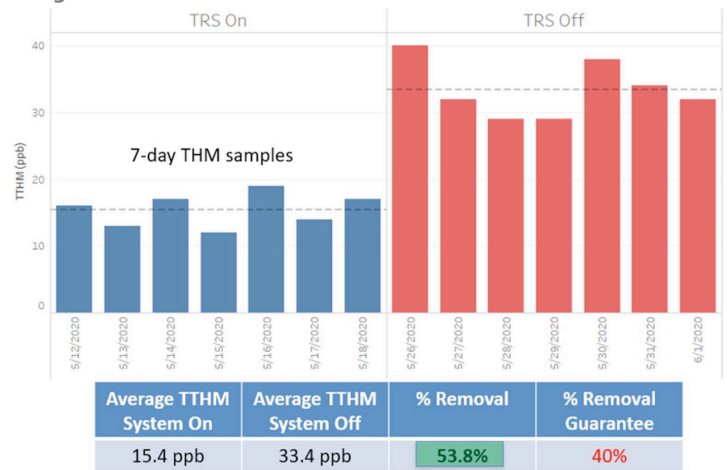
The city chose to install the PAX TRS™ alongside a PAX PWM-500 tank mixer to maximize THM reduction levels. As a result, our engineers felt confident that a warranty backing a 40% THM reduction was achievable.

System Validation occurred approximately six months after installation. The system validation occurred over a 14-day period to allow for the system to reach equilibrium in THM formation and removal.

*"The PAX TRS™ system exceeded the original THM removal expectation and as a result, we have a much greater degree of THM control in our water system."*

Jason Meeks, Supervisor  
San Luis Obispo Water Treatment Supervisor

Figure 2



## RESULTS



- PAX TRS™ was able to achieve a 50% reduction in THMs.
- The installation of PAX TRS™ resulted in the THM formation curve to be shifted downward (as seen in Figure 1) with a difference of roughly 20-25 ppb.
- PAX TRS™ allowed the system at SLO to achieve an average of TTHM level of 15.4 ppb with the system on. When compared to that average TTHM with the TRS off, that measurement was doubled at 33.4 ppb. See figure 2.
- PAX TRS™ achieved reductions in a shorter time span and by a noticeable margin compared to the previous baseline.
- PAX TRS™ gave the operating staff much more control over the THMs in their water system.

## CONCLUSION

The city staff were quite pleased with the results of the TRS' performance. Having surpassed their initial expectations, the operating team were thrilled to know that their goals of reducing overall THMs, increasing the efficiency of their system, as well as gaining more control over the THMs in their system, were met. They continue to manage and monitor the THM levels of the tanks in their system with the use of our technology.

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Figure 1

