APPLICATION BRIEF

Real-time THM Data Optimizes Wastewater Treatment in Paso Robles

The City of Paso Robles, California, operates a 4.9 million gallon-per-day wastewater treatment plant (WWTP) serving 36,000 residents and several local vineyards and wineries. Treated wastewater is used for groundwater recharge (GWR) to replenish the Paso Robles water basin and Salinas River, and the facility must comply with stringent NPDES permit limits for total nitrogen (TN) and trihalomethanes (THMs).

In 2015, after a 47-million-dollar upgrade to its Biological Nutrient Removal (BNR) process, designed to reduce TN levels, the plant saw an unexpected increase in THM formation, particularly bromodichloromethane (BDCM) and dibromochloromethane (DBCM). With average total THM (TTHM) levels reaching 60 part per billion (ppb), the facility faced quarterly fines for THM violations. To address this, the city trialed the use of chloramination to reduce THMs without compromising disinfection or TN removal.

Chloramination Trials and Monitoring

In 2016, the city began a chloramination trial, where ammonia was added to form monochloramine, a disinfectant that produces fewer THMs. However, standard lab testing for THMs, which took up to two weeks for results, made optimizing the process in real-time difficult. To address this issue, the city installed an online THM analyzer, THM-100™, developed by AMS. The analyzer, installed post-disinfection, offered high-frequency data critical for optimizing the chloramination process. With sensitivity as low as 0.1 ppb, it allowed operators to track THM fluctuations and promptly make the necessary treatment adjustments.

Real-time THM Data

The THM-100 provided real-time data on TTHM, BDCM, and DBCM levels. The real-time data allowed operators to observe daily THM fluctuations, revealing how plant operations affected THM formation. For example, THM levels peaked mid-morning and dropped in the afternoon, correlating with operational cycles.

Optimizing Plant Operations

The online THM monitor was crucial in optimizing the chloramination process, helping the city maintain compliance with NPDES limits. By increasing the ammonia-to-chlorine ratio, operators were able to reduce TTHM levels and shift THM speciation towards chloroform, which suppressed the formation of regulated BDCM and DBCM.

The analyzer also identified operational issues that would have been missed with traditional lab testing. For instance, it detected high THM levels in June 2016 caused by a malfunctioning ammonium dosing pump. In July, it alerted operators to a miscalibration in an ammonia monitor, preventing a significant increase in BDCM levels.

Paso Robles' use of the online THM-100 analyzer enabled the plant to evaluate the DBP prevention strategy and ensure the quality of treated wastewater used in the GWR program.

City of Paso Robles Wastewater Treatment Plant

a: 1225 E. Arques Avenue, Sunnyvale, CA 94085 | t: +1 (408) 523-1900
e: info@ams-h2o.com | w: ams-h2o.com