Coachella Valley Water District, California

Real-time Remote Monitoring Optimizes Operations

Case Study

Background

The Coachella Valley Water District (CVWD) is a regional utility, certified by the California legislature in 1918 to protect local waterways from contamination. CVWD has grown into a multifaceted water agency that serves 270,000 residents in several communities in southeastern California.

In its wastewater division, CVWD maintains 1,160 miles of sewer pipe, of which 90 miles is force mains. The system also has 22,355 manholes, 27 lift stations, 133 air-release valves and five wastewater treatment facilities.

The Challenge

CVWD needed help tracking inflow and infiltration (I&I), reducing sanitary sewer overflows (SSO) and a way to supplement its Supervisory Control and Data Acquisition (SCADA) system for operating and monitoring its lift stations. Odor and corrosion caused by Hydrogen Sulfide (H2S) also was a problem.

It came time for CVWD to take an innovative approach to managing its sewer collection system after 128,000 gallons untreated wastewater spilled into the Coachella Valley Stormwater Channel, a drainage area designated as a protected waterway because it is natural wildlife habitat and a tributary to the Salton Sea. Power failed to the Water Reclamation Plant No. 10 on Sept. 22, 2020, prompting the massive SSO. The California Water Control Board fined the city of Coachella $237,000 for the incident, which violated state and federal Clean Water Act laws.

The Solution

CVWD implemented real-time sewer-monitoring technology a few months after the spill to address both the viability of its sewer system and environmental concerns. Deploying SmartCover Systems' SmartLevel sensors, CVWD wanted the ability to remotely observe and operate its wastewater collection system around the clock and be able to immediately respond to emerging issues before they ballooned into big problems.

The ultrasonic sensors are mounted underneath existing manhole covers and surveil CVWD's collection system without staff needing to physically enter confined spaces. Alerts and alarms as well as useful data are transmitted in real time to a secure dashboard and through a mobile application. The data is transferred using the reliable Iridium Satellite Network, which is supported by the U.S. Department of Defense.

The Result

Smart technology is now guiding CVWD's preparation for and response to recurring challenges. Pre-set, low-level alerts and high-level alarms warn of potential surcharges due to inflow and infiltration, power outages, blockages caused by fats, oil and grease (FOG), and other disruptive issues. The ultrasonic monitors combine hardware with software to glean real-time data that is used for analysis, to make informed operational decisions and for compliance reporting.

CVWD operations staff has improved response times and reduced incidents by identifying potential problems early and performing corrective actions before issues can escalate. This proactive approach has prevented SSOs and helped maintain the collection system's integrity. Knowing level trends has helped schedule maintenance only when it is needed. That knowledge has eliminated over cleaning high-risk areas and allows the small staff time to address other, more immediate concerns. Staff also can move the monitors around to surveil various locations as needed.

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Highlights

- **Avoided SSOs with advanced warning**
- **I&I Tracking with SmartFLOE**
- **Optimized lift station monitoring and control**
- **Knowing level trends eliminated over cleaning**
- **Manage H2S gas levels and fine-tune dosing rates**
- **Monthly SmartInsights summarize collection system performance**

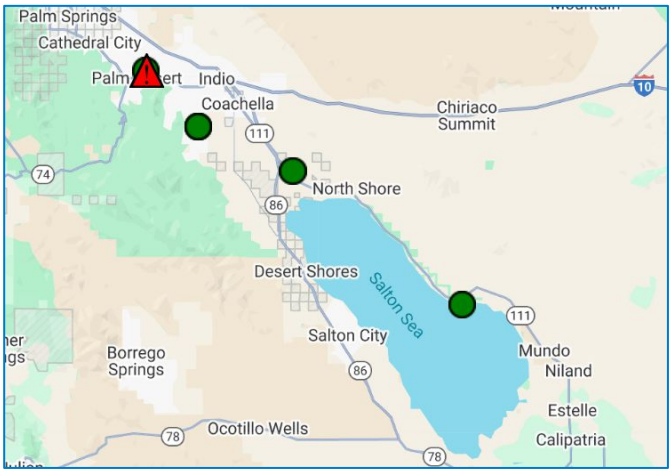

Figure 1: SmartLevel monitors in Coachella, one showing an alert

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In 2021, CVWD added a SmartCover H2Scents sensor to address the odor complaints from residents in La Quinta. With data from the H2S sensor, CVWD has been able to manage sewer gas levels and fine-tune dosing rates for better odor control, improving the quality of life for residents. The data also was integral in the creation of CVWD's Odor Management Plan required for regulatory compliance.

In addition to the SmartLevel monitors and the H2S sensors, CVWD also uses SmartFLOE for tracking I&I and capacity assessment, and H2Scents to measure H2S levels over extended periods of time. A total of eight SmartCover solutions are used by CVWD.

Monthly SmartInsights reports automatically deliver a summary of the collection system's performance, including the number of potential spills that were averted and a comparison to the previous month. SmartInsights also provides takeaways for the SmartFLOE and H2S applications, informing the operations staff where flow was the highest during the month and how many H2S sensors exceed their high alarm threshold.

Conclusion

The real-time monitors have brought CVWD operations staff peace of mind, knowing that the district's sewers and lift stations are being monitored 24/7. Several potential public health hazards were prevented because early warnings have changed operations from reactive to proactive.

The ability to make data-based risk assessments preserves time, money and other resources to optimize operations and effectively comply with regulatory requirements and address staff safety, public health and environmental sustainability.

Figure 2: Primary sewage lift station in the Coachella Valley Water District

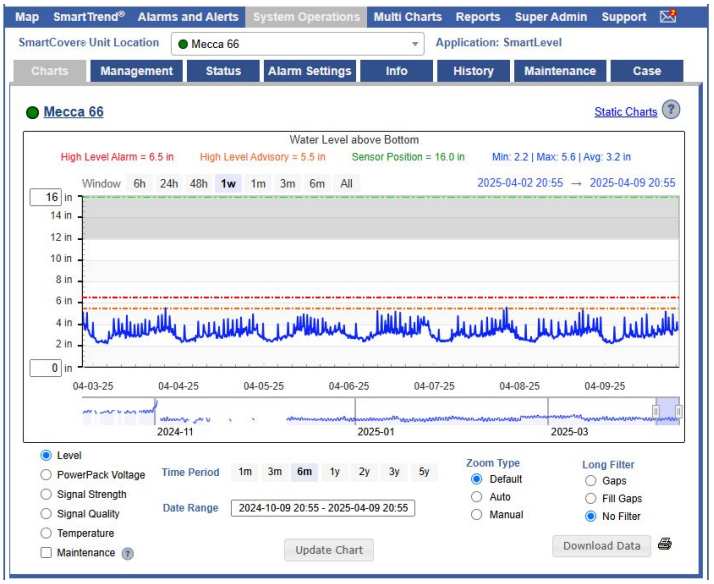

Figure 3: Changes in flow patterns are quickly identified to prevent spills

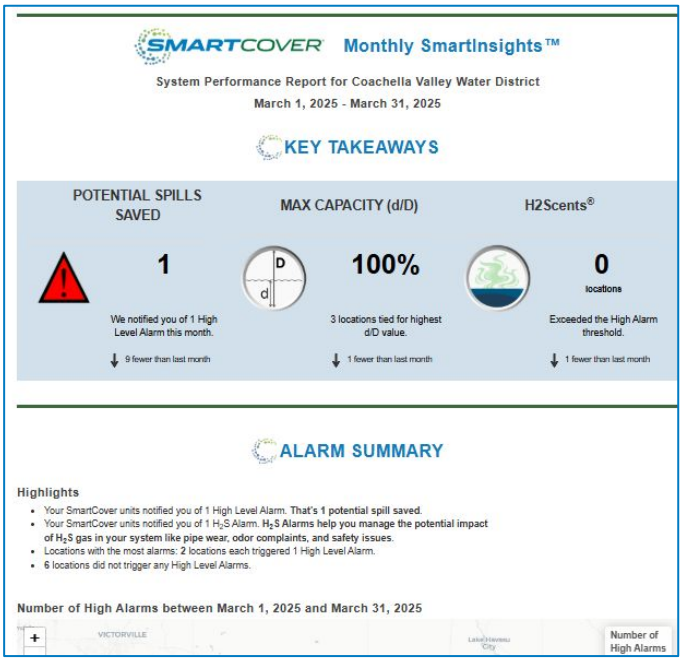

Figure 4: Intro to the SmartInsights monthly performance report

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