

City of Banning Demonstrates the Efficacy of SafeGuard™ H2O Technology for Sustainable Cr6 Remediation



The City of Banning, California, which serves a community of 30,000, relies on well water with elevated levels of Cr6 for its drinking water supply. SafeGuard™ H2O, a novel reduction/coagulation/filtration (RCF) technology that generates a stannous reagent in-situ via an electrolytic process, is unique in its ability to provide economical and reliable Cr6 treatment. SafeGuard H2O uses the electrolytic process coupled with real-time water quality monitoring to achieve stannous generation and optimized dosing. The fully automated system uses a food-grade tin metal precursor and an in-situ electrolytic generator to create a non-toxic stannous reagent onsite and on demand.

A SafeGuard H2O demonstration system was installed at the City of Banning's Facility Well C2 from June-September 2022. Facility Well C2 is one of nine groundwater production wells operated by the city impacted by Cr6. With a nominal production capacity of approximately 1,100 gallons-per-minute, Facility Well C2 represents 40 percent of the city's total nominal production capacity impacted by Cr6 contamination.

The scope of the demonstration focused on the safe, reliable reduction of Cr6 to Cr3 using the electrogenerated stannous reagent. Specifically, to evaluate the technology's ability to achieve the following goals:

- Convert influent Cr6 to Cr3 with no more than 5 parts per billion (ppb) residual Cr6 remaining
- Residual total chromium [Cr(T)] in the treated water should be no greater than 10 ppb
- Residual tin in the treated water should be no greater than 50 ppb

Demonstration Results

During the demonstration period, the influent Cr6 levels varied between 7.3 and 18 ppb, with an average raw water concentration of 15.5 ppb (Figure 1). SafeGuard H2O effectively treated Cr6 contamination in the source drinking water to well below 10 ppb, successfully meeting the testing objective to produce an effluent with Cr6 levels below 5 ppb. Following treatment with the in-situ electrogenerated stannous reagent, effluent Cr6 levels were consistently at or below 1 ppb, with an average of 0.22 ppb which is a 98.55% reduction from raw influent levels before treatment.



SafeGuard™ H2O Cr6 demonstration at the City of Banning.

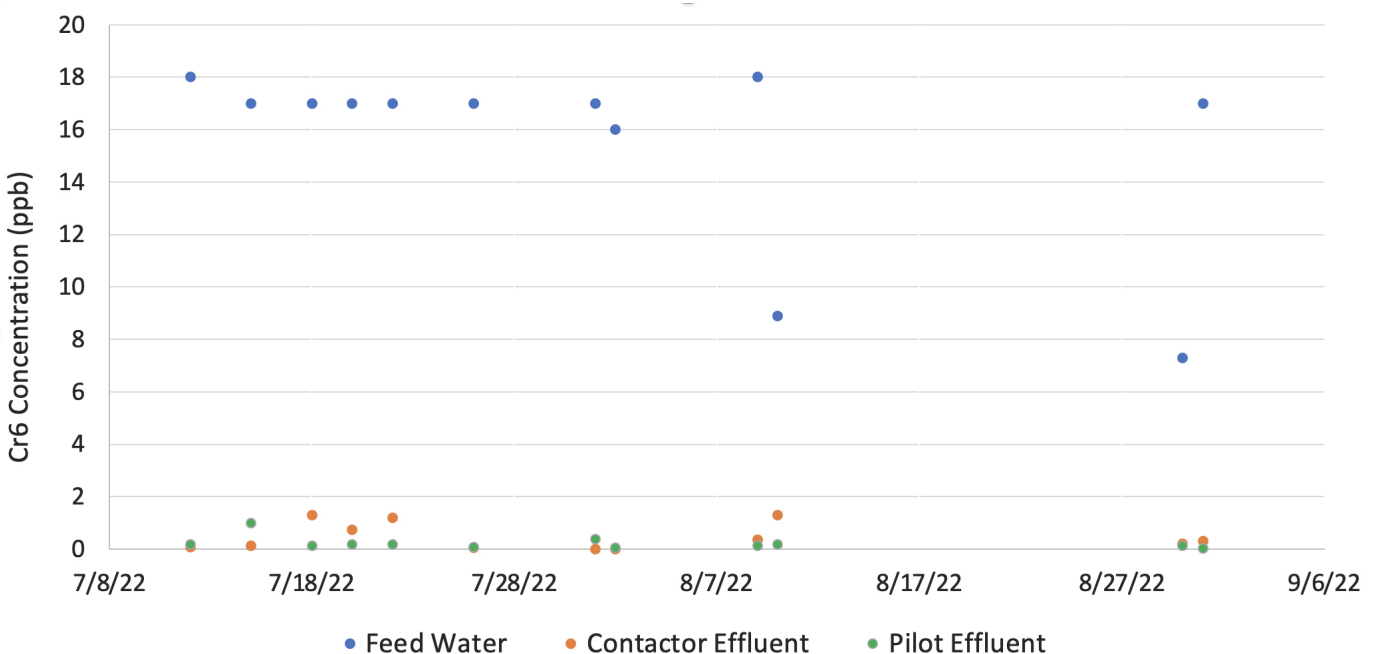


Figure 1. Cr6 concentrations from the feed water, contactor effluent and pilot effluent at SafeGuard™ H2O technology demonstration with the City of Banning, California.