

CASE STUDY

Maui Department of Water Supply

Maui Water Achieves Greater Independence and Increases Operational Resiliency by Generating Bleach On-Site



OVERVIEW

Established in 1913, the County of Maui Department of Water Supply (DWS) has been a major source for clean water production for the island of Maui. With most of DWS's water being sourced from groundwater near the Iao Aquifer underneath the West Maui Mountains, it is a crucial utility to the island.

DWS serves thousands of residents daily. It is responsible for providing drinking water to over 36,400 service connections across three islands. The agency supplies 33.5MG of drinking water each day through a system that includes six surface water treatment facilities, 145 storage tanks with a combined storage capacity of 295 MG, and roughly 750 miles of distribution pipelines.

SITUATION

Officials at DWS were informed that their sole supplier of chlorine gas planned to cease providing the product, giving them roughly one year to get new disinfection systems up-and-running at six surface water treatment plants and three well sites. As DWS officials evaluated alternatives to gas chlorine, they sought autonomy from chemical supply companies serving the Hawaiian Islands. Additionally, they wanted a technology that would increase safety and resiliency in case of a natural disaster.

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Officials performed an evaluation of alternative forms of chlorine bleach by comparing both the capital equipment and operating costs, as well as the costs and risks of handling hazardous materials. DWS compared bulk sodium hypochlorite, calcium hypochlorite, and on-site sodium hypochlorite generation (OSHG). Recent changes in local safety standards required DWS to reduce or eliminate hazardous materials used in proximity to local schools. The sodium hypochlorite produced on-site, at 0.8% concentration, met the requirements since it is below the hazardous material threshold of 1%. The OSHG option satisfied DWS's need for safety, autonomy and resiliency, while still achieving the lowest overall life cycle cost.

APPROACH

After settling on OSHG, DWS officials began to evaluate technology providers. DWS wanted more than just an equipment supplier. It sought a trusted partner with an established track record of success. They wanted a technology and service leader that could provide training, expertise and support, both locally and from the mainland.

The Microclor® OSHG system was an obvious choice for DSW. It featured vertically-oriented electrolytic cells to ensure safe evacuation of hydrogen gas by-product and a modular system that required less space than other on-site disinfection systems.

DSW chose a design and build approach to maintain control and to achieve the project goals by the required completion date. DSW contracted the Aqueous Vets to design and install the Microclor® OSHG systems at four separate water treatment plants.



DSW Hypochlorite storage tank, brine tank and pallet with bags of salt.

RESULTS

20% **BELOW**
The Hazardous
Material Threshold

- The investment in Microclor® OSHG allowed the WTP to generate its own disinfectant onsite at a much safer concentration of 0.8%.
- The Microclor® OSHG also reduced the overall costs of operation given that they are now able to generate their own disinfectant at the facility itself, as opposed to buying from third party sources.
- The new smaller, vertically-oriented cells can be fully cleaned and drained in-place, resulting in a smaller installation footprint and only a fraction of the operator’s time needed for maintenance cleanings.
- Microclor® OSHG is a much safer alternative to more hazardous options, such as gas chlorine or calcium hypochlorite, thus increasing the general safety of the employees working at these various facilities.

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“The Microclor® OSHG systems are a safer, cost-effective alternative to gaseous chlorine. The systems are working very well. The operators, even the ones who were originally skeptical, are VERY happy with OSHG and the Microclor® systems in particular.”

Tony Linder, Division Chief, County of Maui
Department of Water

CONCLUSION

DWS was extremely satisfied with the convenience of the Microclor® OSHG. The project, as initially outlined, required all four systems to be up-and-running within a year. Field work commenced a week before the designated deadline. The conversion to sodium hypochlorite generation was completed on-time and on budget without any change orders. Since then, the Microclor® OSHG has enabled DSW to reduce costs and increase operational efficiency.

Disinfection Option	Cost Per Pound of Free Chlorine	Capital Cost	Safety
Gas Chlorine	\$1.10 - \$1.30	Low	Hazardous Gas
Bulk Sodium Hypochlorite	\$3.50 - \$4.50	Low	Hazardous Liquid
Calcium Hypochlorite	\$3.85 - \$4.50	Low	Hazardous Solid
On-Site Generated Sodium Hypochlorite (OSHG)	\$1.05 - \$1.30	High	Non-Hazardous Liquid