

TROJAN UV

CASE STUDIES

Environmental Contaminant Treatment



TrojanUV Solutions for Taste & Odor and Algal Toxins:
Treating Trace Contaminants and Disinfecting with
UV in Drinking Water

On Demand Taste and Odor Treatment with UV-Oxidation: Lucerne, California

The town of Lucerne, California, is located on the shores of Clear Lake (shown above) approximately 85 miles northwest of Sacramento. The water treatment plant in Lucerne feeds 1,230 service connections serving roughly 3,000 people in Lucerne and the surrounding Riviera subdivision.

Lucerne draws its drinking water from Clear Lake. Clear Lake is relatively shallow with an average depth of 27 feet and a maximum depth of 60 feet. The lake reaches average summer temperatures of 76° F, providing ideal conditions for algae blooms. On particularly hot days, town residents have stated that the smell of algae coming off the lake can be overpowering. These algae blooms also create an earthy/musty taste and odor in the town's drinking water. The original treatment process consisting of up-flow clarifiers, pressure media filters, GAC contactors, and chlorine disinfection was often unable to remove sufficient amounts of MIB and geosmin, the algal compounds responsible for the taste and odor (T&O) problem.

While trying to solve the T&O issues, engineers also began looking for a solution that would provide secondary disinfection and thereby reduce chlorine usage and disinfection by-product (DBP) formation. After investigation, the plant's engineers proposed a UV-oxidation system that would provide them with 3-log *Cryptosporidium* reduction while providing a 1.3-log reduction (95%) of geosmin.

4L12 unit runs year-round, providing an inactivation barrier to chlorine-resistant pathogens (e.g. *Cryptosporidium*) while the TrojanUVSwift™ECT 8L24 is only used during T&O events. This on-demand T&O solution optimizes performance while minimizing O&M costs.

THE TROJAN UV SOLUTION

In the fall of 2007, Trojan Technologies was selected as the supplier for the UV portion of the water plant reconstruction. Trojan offered a unique package consisting of (1) TrojanUVSwift™ 4L12 unit for disinfection purposes and a TrojanUVSwift™ECT 8L24 for geosmin and MIB destruction. This system allows Lucerne to reduce the level of chlorine needed to disinfect pathogens such as *Cryptosporidium* and *Giardia*, which will reduce the formation of DBPs. The TrojanUVSwift™

FULL SCALE SYSTEM

SYSTEM DESIGN PARAMETERS

- PEAK FLOW CAPACITY: 1.01 MGD
UVT: 86 % per cm
- DESIGN INFLUENT GEOSMIN CONCENTRATION: 100 ppt
- DESIGN GEOSMIN REDUCTION: 1.3-log
- DESIGN DISINFECTION: 3-log *Cryptosporidium* Inactivation