

CASE STUDY

EXTENDING CHLORINE RESIDUALS AND REDUCING
DISINFECTION BY-PRODUCTS USING CLEARITAS®

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INTRODUCTION

Blue Earth Products is the leader in innovative approaches to water quality standards. Our suite of products removes chlorine demand and sources of disinfection by-products in water distribution systems by eliminating biofouling and other organic laden deposits enabling utilities to easily sustain chlorine residuals system wide while reducing the formation of disinfection by-products (DBPs).

Blue Earth Products was brought into the city of Winslow, Indiana, to demonstrate that the addition of Clearitas to the distribution system could reduce chlorine usage and improve disinfection by-product levels. Used to remove biofouling and other forms of chlorine demand, Clearitas is a formulation of oxygenated salt cluster ions that is added to drinking water distribution systems. When used in conjunction with existing chlorine based disinfectants, Clearitas has been shown to effectively lower chlorine demand and reduce disinfection by-product formation in many municipal settings.

At Winslow, Clearitas dosing was started at a concentration of 20 ppm (of product). After two months, the dosing rate was cut in half (to 10 ppm of product). Additionally, in conjunction with the Clearitas dosing, Winslow could lower their total chlorine dosing from an average of 2.1 ppm to 0.9 ppm due to the reduction of chlorine demand observed in the distribution system.

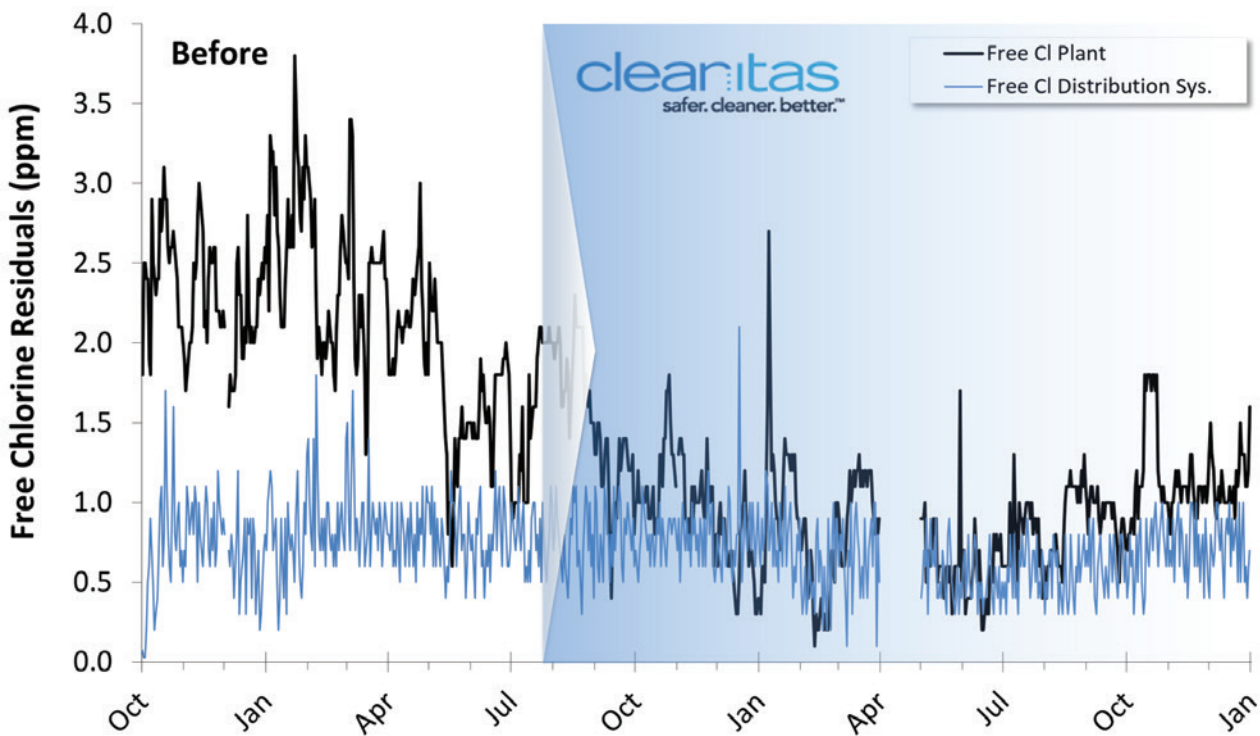


Figure 1 - Reduction in chlorine demand between the plant and distribution.

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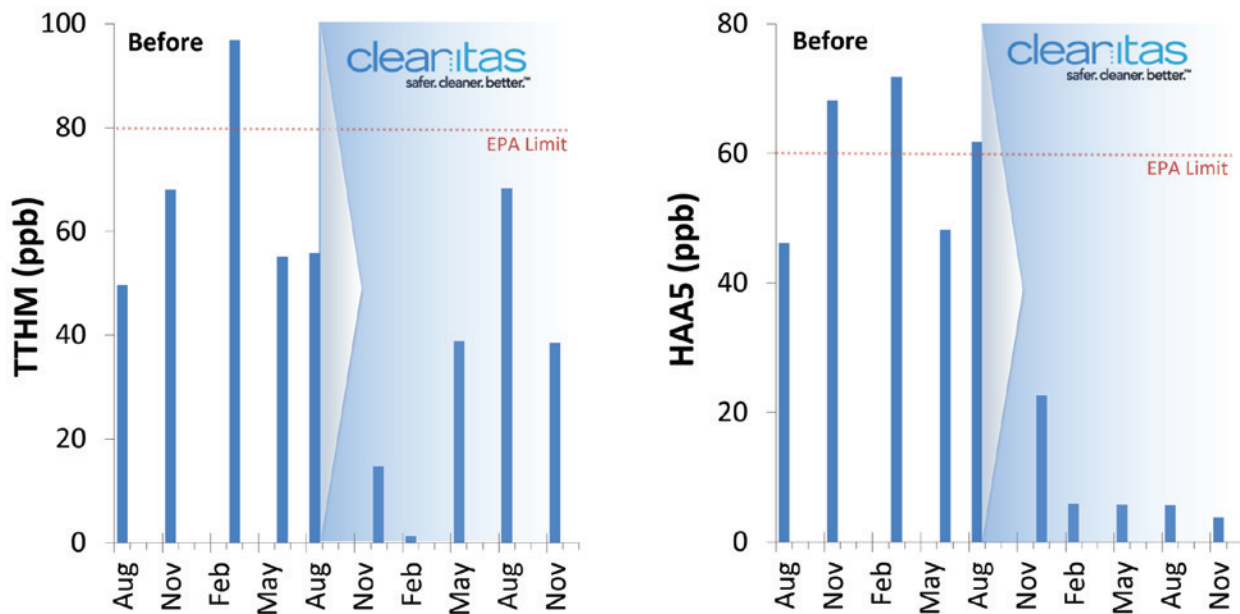


Figure 2 - Disinfection byproducts before and after treatment

RESULTS

Figure 1 shows distribution system residuals as well as the chlorine additions required at the plant to maintain them. In this case, the water operators could decrease the chlorine injections by half and still maintain appropriate residuals in the distribution system. As evidenced here, removing chlorine demand and biofouling results in the extension of chlorine residuals deeper into the distribution system.

Additionally, improved water quality is shown in the Figure 2 plots of disinfection by-products where significant reductions in both TTHMs and HAA5s occurred immediately after the addition of Clearitas and stayed low throughout the course of the study. Biofouling can be a significant source of disinfection by-products, its removal can greatly improve DBP levels. For example, November through August saw a 55% and 84% reduction in TTHMs and HAA5s respectively from the same period prior to Clearitas use.

DISCUSSION

In this particular system, a low dosing of Clearitas was very effective at reducing chlorine demand and decreasing the disinfection by-products in the distribution system. In fact, this particular customer had no compliance issues related to DBPs after the addition of Clearitas as part of his water treatment program and reported no adverse side effects throughout this study. Additionally, with the supplemental Clearitas added, the customer was able to maintain sufficient chlorine residuals in the system even with the lower chlorine dosing leading to significant savings.

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