CASE STUDY

HOSPITAL LEGIONELLA REMEDIATION USING CLEARITAS®

clearitas®
safer. cleaner. better.®

INTRODUCTION

Blue Earth Products® is the leader in innovative approaches to improve water quality in both commercial process and drinking water applications. Our products work in conjunction with existing primary disinfectants to eliminate organic and inorganic scale from any water surface in a cooling, process, or potable water system.

In 2007 a water engineering firm was involved with assisting a research hospital with a major Legionella contamination problem within their drinking water system in the hospital. (Note: For privacy purposes, the hospital and firm have asked to remain anonymous).

The goal of the study was to determine whether Clearitas could minimize the Legionella problem while having little or no adverse effects on the facility's infrastructure and water quality. Clearitas is a proprietary formulation of oxidized chlorine that is added to drinking water distribution systems. Used in conjunction with existing disinfectants, Clearitas has been shown to effectively lower chlorine demand and improve bacteria levels in many municipal and commercial settings.

Distal points within the hospital distribution system were measured weekly for four (4) weeks before the trial of Clearitas. The following metrics were measured at each time point:

- Bacterial (Legionella, heterotrophic plate count (HPCs))
- pH
- Copper levels (for corrosion)
- Lead levels (for corrosion)
- Langelier and Ryznar Indices (for scaling/corrosion)
- Disinfection by-products (trihalomethanes (THMs), haloacetic acids (HAA5s))

Clearitas was dosed at a rate of 1 gallon of Clearitas to 2,000 gallons of incoming water supply to the hospital. Both the hot and cold-water distribution systems were measured during the course of the study. Additionally, incoming (pre-Clearitas) city water was tested just after the addition of Clearitas for a number of the above parameters (such as DBPs). The water engineering firm hired by the hospital performed all of the analysis and provided the data to Blue Earth Products.

RESULTS

Prior to the addition of Clearitas, the hospital had regular and lasting Legionella issues. Figure 1 is the measured amounts of Legionella in the hot water system before and after the addition of Clearitas. Also shown on this graph are the average values of chlorine residuals measured at twelve hot water distal points in the system. These values are plotted in comparison to the average chlorine residual of the incoming water. (Note: The engineer noted that elevated levels just prior to the addition of Clearitas were probably due to a recirculation pump failure occurred that week.) As can be seen in Figure 1, Legionella counts went down after two (2) days of product the study.

Table 1 summarizes the other measurements taken over the course of the study. Since the recirculation pump failure during week four (4) seemed to have an adversely large negative effect on several measurements, the week four (4) data is excluded from this analysis. The DBP values are reported as the difference between the incoming city water and the residuals noted throughout the hospital.

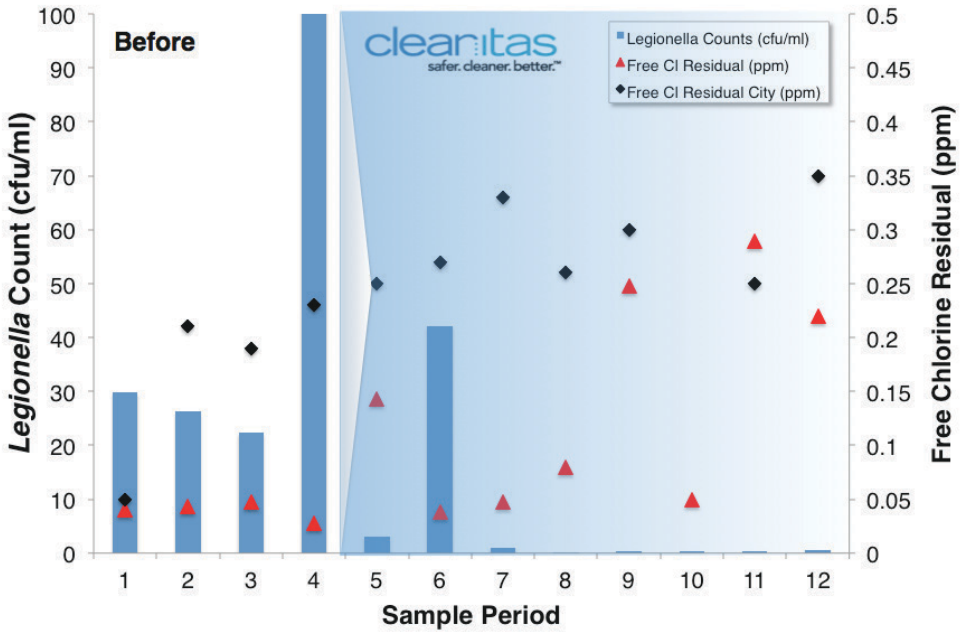

Figure 1 - Legionella decrease and residual increase after the addition of Clearitas (sample period 1-4 corresponds to weekly sampling, sample period 5-12 corresponds to 1, 2, 3, 7, 10, 17, 24, 31 days after start of treatment)

	pH Hot	pH Cold	Langelier	Ryznar	Cu Hot (ppm)	Cu Cold (ppm)	Pb Hot (ppb)	Pb Cold (ppb)	TTHM Hot (ppb)	TTHM Cold (ppb)	HAA5 Hot (ppb)	HAA5 Cold (ppb)	HPC Hot (cfu/ml)	HPC Cold (cfu/ml)
Avg. Before Clearitas	7.8	8.2	-0.92	9.83	0.08	0.06	4	3	21	19	12	8	9	21
Avg. After Clearitas	7.9	8.1	-0.88	9.90	0.06	0.03	3	1	24	17	10	19	11	4

Table 1 - Summary of additional measurements taken during the study

DISCUSSION

The addition of Clearitas to this hospital's water supply had a rapid, impactful effect on the Legionella problem within the distribution system. After two weeks, the Legionella counts went down to near undetectable levels and the chlorine residual within the hospital went up significantly.

Additionally, the other water chemistries seem to be unchanged by the addition of Clearitas during this study. As seen in Table 1, little or no change occurred for pH, metal levels, corrosion, etc. Where changes are seen in this data, the numbers are relativity small and well below EPA guidelines.

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