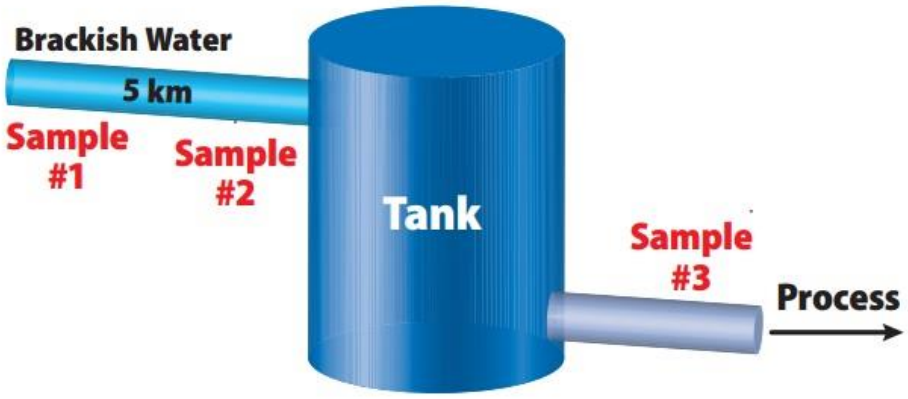
Case Study: Feedwater Delivery System Audit Using ATP Measurements

Background

A Western Canadian oil producer utilized LuminUltra's Quench-Gone Aqueous (QGA) test kit to perform an audit of its feedwater delivery system. The site acquired water from underground brackish water wells and transported this water through a 5 kilometer pipeline to the site. Water was then stored in a large tank prior to being sent to the process.



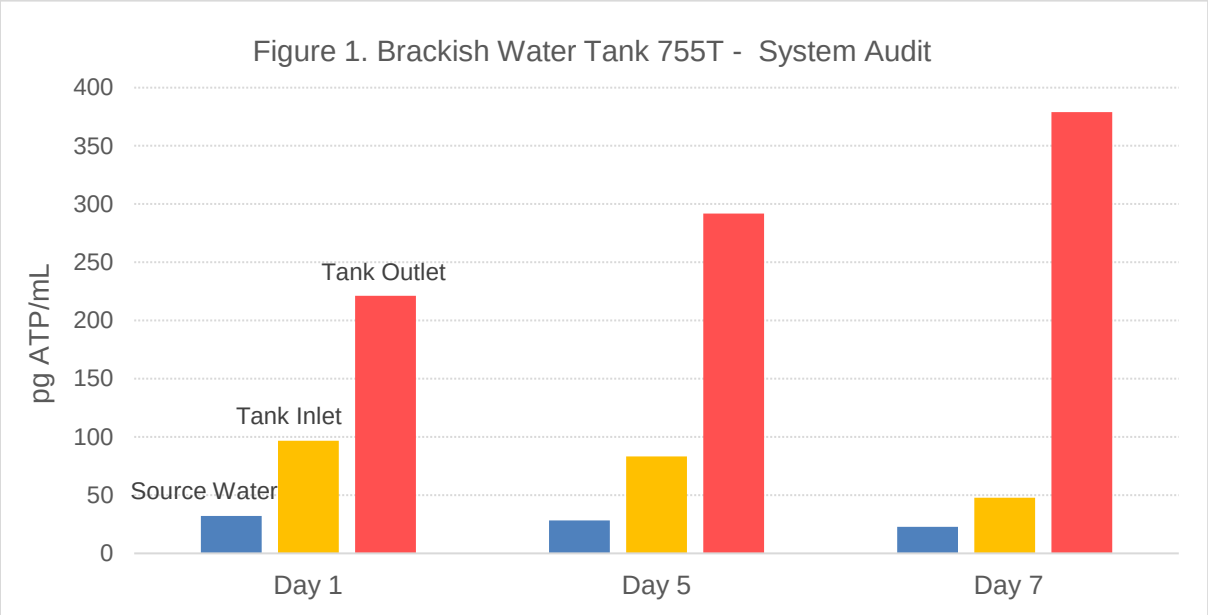
The goal of the site audit was to assess microbiological accumulation throughout the water delivery system. Unlike conventional Heterotrophic Plate Count (HPC) measurements, QGA measures true total microbiological concentration by detecting all organisms, even those that are viable but not culturable.

Testing

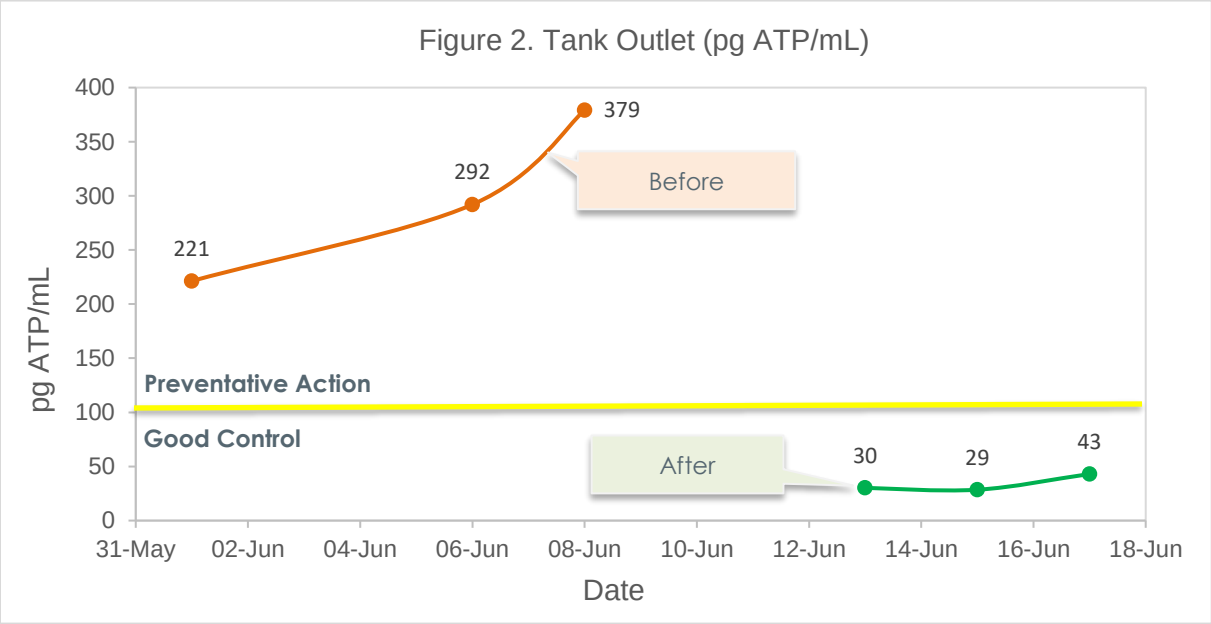
Three sets of measurements were made initially over 3 days at the source water sample point, the tank inlet and the tank outlet. Results are reported in pg ATP/mL and for untreated process water, typically <100 pg ATP/mL is considered good control.

Results

Although the level of total microorganisms was relatively low and constant in the brackish source water, there was a significant increase through the water pipeline and in the tank which led to much higher concentrations being delivered to the process (Figure 1).



This elevated level presents two risks: microbiologically influenced corrosion (MIC) in the delivery system, and elevated load on the process used for water treatment and steam generation. Subsequently, operators decided to clean the feedwater delivery pipeline and storage tank by disinfecting the system over three days.



Due to the significant drop in ATP levels, the cleaning event was deemed effective and the QGA results compiled during this audit created a starting point for a water quality management program to prevent microbial accumulation in the feedwater system. Following the cleaning event, there was **no longer an increase** in microbiological contamination in the water delivered to the site or exiting the storage tank (Figure 2).

Conclusions

QGA ATP measurements provide an immediate assessment of microbial contamination in the system, and allow you to quickly verify the efficacy of cleaning initiatives. With a wider detection range, and improved sensitivity, it provides the first line of defense against microbiologically influenced corrosion and biofilm build-up in any pipe lines or storage tanks!

Visit www.luminultra.com for more resources or sign up for LuminUltra Academy for access to on-demand training courses on microbiological monitoring in the Oil and Gas industry.