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SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT ONLINE CHLORINATION AND DECHLORINATION ANALYZERS PERFORMANCE EVALUATION REPORT

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Project Test Site

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Sacramento Regional County Sanitation District (SRCSD)
Sacramento Regional Wastewater Treatment Plant (SRWTP)

Manufacturers

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The purpose of this publication is to report on the performance of online chlorination and dechlorination analyzer technologies for wastewater treatment applications. This evaluation report is intended to provide information regarding online analyzer operational conformance to conditions and standards typical of a specific testing environment. It is also intended to provide designers and operators with an information package to assist with the selection of online analyzers and provide instrument manufacturers with information regarding equipment requirements for specific applications.

This report presents results of field test data in tables of parameters and graphs of data that quantify performance and accuracy. It is difficult to compare these results in a general methodology because instrument applications and conditions vary greatly. Therefore, the reader of this report is responsible for determining which parameters are of most importance to their application and to select the most suitable instrument for their respective needs. It is also emphasized that a complete assessment of the information presented herein requires that the report be read in its entirety.

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ABSTRACT

Scope:

This report presents the results of three online chlorine residual analyzers and dechlorination analyzers field-tested in real-time, process-monitoring conditions. The Sacramento Regional County Sanitation District (SRCSD), Sacramento Regional Wastewater Treatment Plant (SRWTP), sponsored and conducted this test. The District field-tested three online chlorine residual analyzers and two dechlorination analyzers over a period of three months utilizing amperometric electrode cell and gas sensor analyzer technologies supplied by three different manufacturers.

Objective:

The objective of this study was to develop and implement test protocol to evaluate the performance of online chlorine residual analyzers and dechlorination analyzers through a series of field-tests including Calibration, Loss of Sample, Response Time, Point Drift and Interference (for dechlorination analyzers only) in identical test environments to allow for direct comparisons of the results to determine which analyzer would best serve a plant's monitoring needs.

Abstract:

The online chlorination and dechlorination analyzer test project was initiated in the summer of 2003 and was completed in the early part of 2004. The purpose of this project was to evaluate new alternatives for monitoring the plant effluent for permit compliance and process control. Currently the SRWTP uses a 'mixing' box also known as the Renton System that combines dechlorinated final effluent (DFE) and chlorinated final effluent (CFE) samples to analyze the plant effluent stream. The 'mixing' box values are used for dosing bisulfite as part of a feed back control system after dechlorination. The mixture of CFE and DFE from the 'mixing' box is also used to indirectly monitor the plant effluent for chlorine residual on a continuous basis. The current system is complex and difficult to maintain, while new online analyzers on the market offer new technology to perform the same function with less maintenance and complexity.

Since the summer of 2003, SRWTP plant staff prepared testing protocol based on analyzer tests developed and implemented in published studies by the Instrumentation Testing Association (ITA) to evaluate new online chlorine residual and dechlorination analyzers that could be used in lieu of the existing 'mixing' Renton System setup. The rigorous protocol included both 'online' and 'offline' testing. 'Online' testing was conducted on actual plant effluent in parallel using the existing 'mixing' Renton System, whereas 'offline' testing was conducted in a more controlled environment with known standard solutions.

The results from field-testing online chlorination and dechlorination analyzers are presented in tabular and graphical formats. A comparative detailed analysis of the results and how they pertain to the performance criteria for the given sampling application are summarized in this report. The test methodology and the explanations of how the individual tests were performed are also presented in this report.

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