



Case Study: Using Chlorine Dioxide to Control Bromate Formation in El Paso , Texas – 08/25/2005

The Issue

El Paso Water Utilities (EPWU) has used ozone to disinfect and to oxidize taste-and-odor compounds at the Jonathan W. Rogers water treatment plant since it was built in 1993. The plant's source water, the Rio Grande , is consistently high in bromide. Although ozone is a very effective disinfectant and it does an excellent job of reducing taste and odors, it also reacts with bromide to form bromate, a Safe Drinking Water Act-regulated contaminant. As a result, El Paso found itself at various times close to the point of exceeding the bromate maximum contaminant level (MCL).

The Solution

In considering how to control bromate formation, El Paso decided to pilot test an additional treatment step documented in the Water Research Foundation's report, *Use of Chlorine Dioxide and Ozone for Control of Disinfection By-products* (order # 90981F), the result of a Foundation Tailored Collaboration with the Contra Costa Water District and the California Energy Commission. The project had determined that pre-oxidation with chlorine dioxide helped meet the utility's treatment goals, while minimizing bromate formation.

EPWU performed its own lab-scale study to test the effect of chlorine dioxide on its own source water and, with favorable results, is implementing this solution at full-scale. Specifically, the utility is adding a chlorine-dioxide feed following the sedimentation ponds, prior to ozonation. The project was completed in July 2005 and is currently online. EPWU is using the system to optimize the dose. Bromate levels can be directly measured and, thus, the metric used to assess the initiative's success will involve measurements of bromate concentrations. This data is expected within weeks of implementing the chlorine dioxide as a pre-ozonation treatment.

For EPWU, adding chlorine dioxide prior to ozonation provided benefits by ensuring compliance with the bromate MCL. The additional chemical treatment is an added expense, thus the utility doesn't measure the benefits of its solution in monetary terms. Rather, it gauges success in terms of improved decision-making and increased protection of public health.

Lessons Learned

Although by August 2005 EPWU had only one month operating experience, the chlorine dioxide feed project demonstrates that Foundation research can be directly applied to water treatment plants with a minimum of planning. The project documentation was submitted to the Texas Commission on Environmental Quality, which speedily approved EPWU's application to implement the chlorine dioxide pre-treatment.

© 2009, Water Research Foundation. ALL RIGHTS RESERVED. No part of this content may be copied, reproduced or otherwise utilized without permission.

Utility Profile

- The El Paso Water Utilities (EPWU) serves the City of El Paso, Texas
- EPWU supplies an average of 110 million gallons/day (mgd) to approximately 179,000 water customers
- EPWU receives its water supply from ground water, the Hueco and Mesilla Bolsons, and surface water from the Rio Grande and applies conventional water treatment technology

To contact the EPWU concerning this case study, write to John Balliew at jeballiew@EPWU.org