

UC Irvine Cooling Tower Water Reuse Innovation

The University of California – Irvine, with an enrollment of over 35,000 students, has long dedicated itself to sustainability efforts throughout the daily operations and lives of its student body and staff. In 2013, the Office of the Provost and Executive Vice Chancellor created the Sustainability Initiative to provide a platform for interdisciplinary, community-engaged sustainability education and research. This initiative seeks to institutionalize sustainability across campus in fields as wide ranging as clean energy, green building design, waste recycling, and sustainable water management.

In 2018, UCI and EAI Water began implementing a reclaimed water use program, seeking to utilize treated wastewater for cooling towers on campus while maintaining industry standard operational requirements and standards. This wastewater was sourced and treated locally, then transported to UCI for reuse within non-potable applications such as irrigation and cooling demands.

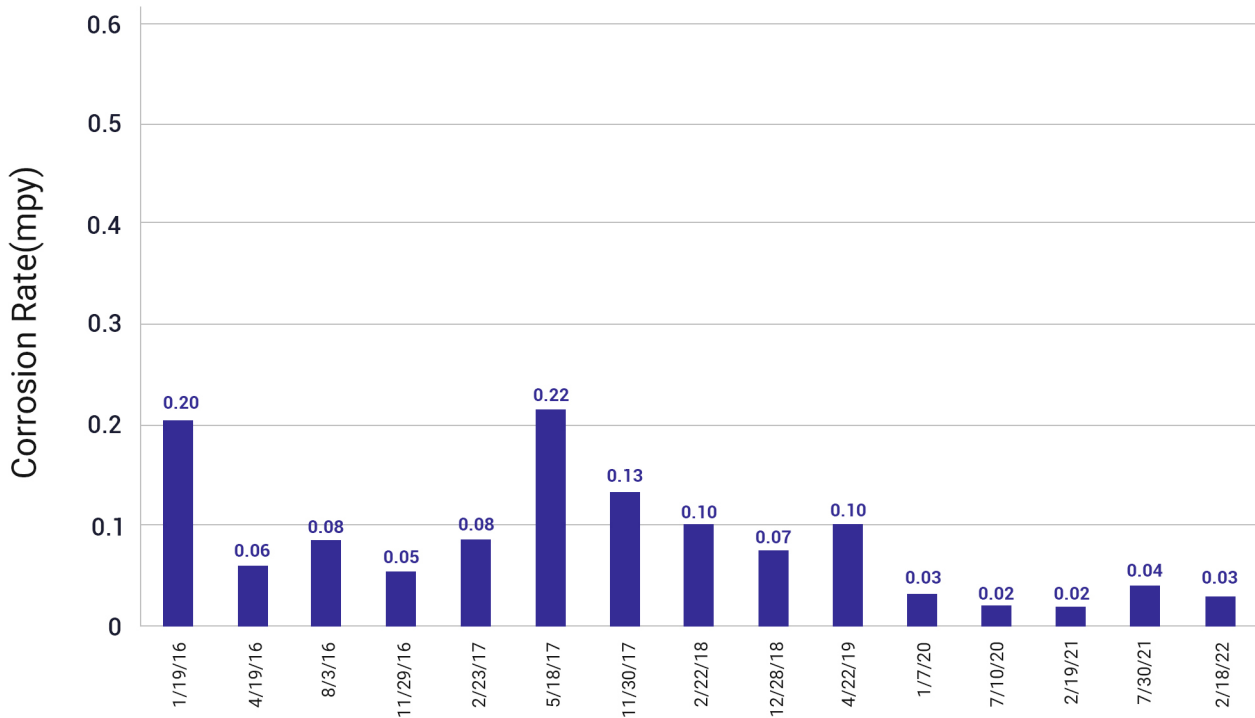
When UCI first began exploring the opportunities surrounding reclaimed water reuse, it was clear to administration and engineering team members that greater water consumption using reclaim water would require greater water treatment usage and more sophisticated management. The root cause for this operational management shift is that reclaim water quality is higher in key mineral content than traditional water sources and may, as is often the case with water supplies, vary in influent quality over time and seasonally.

Two primary concerns for UCI were that converting to reclaim water had the potential to lead to a loss in heat transfer efficiency and longevity on the chillers and surface condenser.

The EAI team worked hand-in-hand with UCI to implement, startup, troubleshoot, and commission this reclaim water effort. After two years of operation, plant data shows no appreciable loss in heat transfer efficiency or longevity on the chillers and surface condenser. One indicator of heat transfer efficiency is chiller condenser approach temperature, which is continuously monitored on the chiller. Condenser approach temperatures for similar load conditions has not appreciably changed since the conversion to reclaim water. An indicator of chiller longevity is steel and copper corrosion rates, which are monitored every 90 days using an independent lab. Steel and copper corrosion rates have not appreciably changed since the conversion to reclaim water.



Copper Corrosion Rate Summary



As part of the reclaim water conversion plan, water quality monitoring and control automation was vastly upgraded. In addition, the water treatment lab manager was provided a far more intensive implementation schedule for overseeing and verifying the water quality monitoring and control.

Within 1.5 years of starting this new water sustainability effort, UCI and EAI Water had, jointly:



Saved 140 million gallons of water



Increased bleed rate by 36%



Zero negative impacts on waterside asset protection



Increased manpower & automation for water treatment program



UCI continues to be a leader in environmental and water stewardship in Southern California. The EAI Water team seeks to provide sustainable, operationally beneficial solutions for its customers and the region to maximize water efficiency using reclaim water and provide clients with an ongoing ROI for its sustainability efforts.

 951-272-8200

 eai@eaiwater.com

 www.eaiwater.com