

January 9, 2023

MEMORANDUM

To: Town of Davie Planning and Zoning Board

From: Nova Southeastern University

Re: 2022 Town of Davie Sustainability Award: NSU Chill Water Plant Reclaim Make-Up Water Project

In July 2021, Nova Southeastern University began a project to transition the utilization of our make-up water for our Zone 4 Chiller Plant from domestic to reclaim, partnering with the Town of Davie for reclaim water provided through the local plant. As a university, we are already utilizing reclaim water for the majority of our irrigation, and with the infrastructure already built into the campus, this was a natural progression to save additional domestic water in our community.

To execute this project, Nova Southeastern University partnered with multiple vendors to prepare the chilled water plant for the change to reclaim water use. These efforts included conducting the annual preventative maintenance on the three chillers, eddy current testing (condenser and evaporator) to validate integrity of the tube bundles, removal of chiller end bells to include new epoxy coatings, and insulation repairs. One of the more important items included the installation of a new flow meter to track and record, through our Building Automation System (BAS), the consumption of reclaim water. Additional items include the equipment, chemicals and monitoring the implementation and ongoing efficiency of the program change.

Chemical system upgrades were additionally necessary to accommodate the feed specifically tailored to the treatment of incoming reclaim water. Previously, the plant utilized an average of 21,000,000 gallons of domestic water annually to make-up for evaporation. The make-up water cost \$279,720 per year (\$13.32 per 1000 gallons). Although the water consumption by transitioning to reclaim will increase to 41,600,000 gallons due to the reclaimed water composition, the total cost of water is expected to decrease to \$10,109 per year due to the lower cost of reclaim water (\$0.243 per 1000 gallons). Additionally, the cost for chemicals to maintain the water treatment will increase from \$5,120 to \$109,200, but that too is expected to be offset by the water savings realized.

The effort to accomplish this transition started with chiller #2, which was completed in April 2022. During this first month, we utilized 50,705 gallons of reclaim water that would have otherwise been used as domestic. In May 2022, an additional 416,931 gallons of reclaim were utilized. Chiller #1 will have the necessary upgrades complete by the beginning of July 2022 and will shift to reclaim at this time. The last chiller, chiller #3 will commence upgrades following chiller #1 completion, with the entire project expected to be complete by September 2022, barring any setbacks.



Return on Investment (ROI):

The total overall Return on Investment (ROI) for the transition from domestic water make up to reclaim water is anticipated to materialize 19 months from project start. The ROI is expected to be **\$242,285 year 3** and **\$591,590 year 5**. Water savings was realized from the first month, which is offsetting the costs for equipment installation, monitoring, and chemicals. By the end of this 19 month period, Nova Southeastern University will have saved more than 35 million gallons of domestic water that is now more readily available for local community.



From Left to Right: Terry Watson, Charlie Ewing, Rob Pulsifer, Jonathan Miller, Gene Vladioiu, Jim Marinelli, Seth Mangasarian, Randall Seneff, Daniel Alfonso

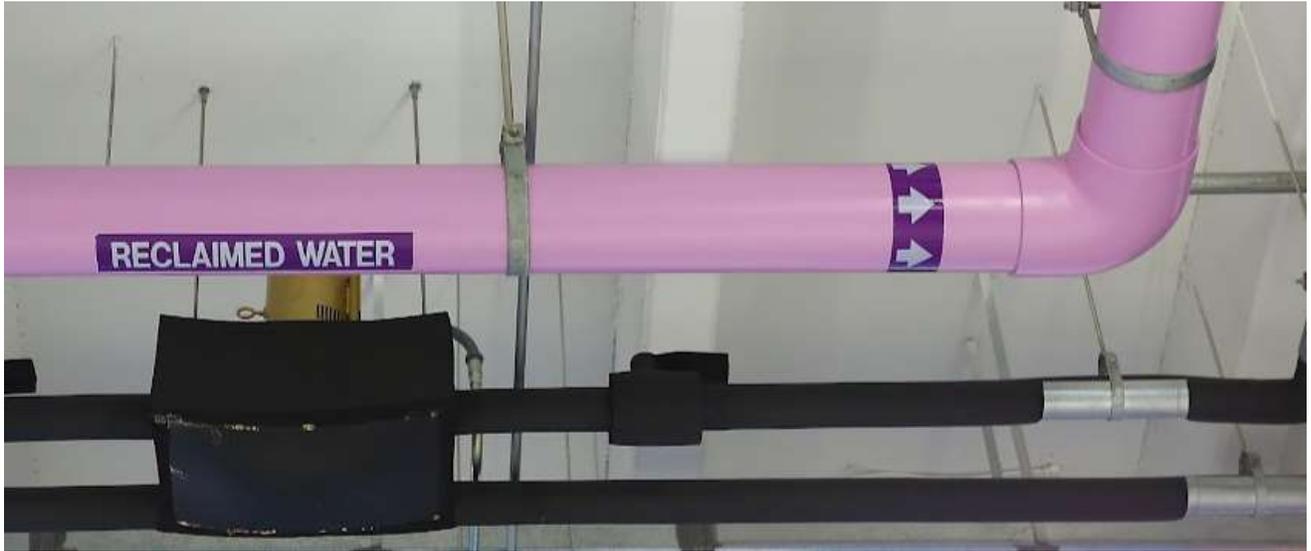


Chiller #2 Tube Sheets Following New Epoxy

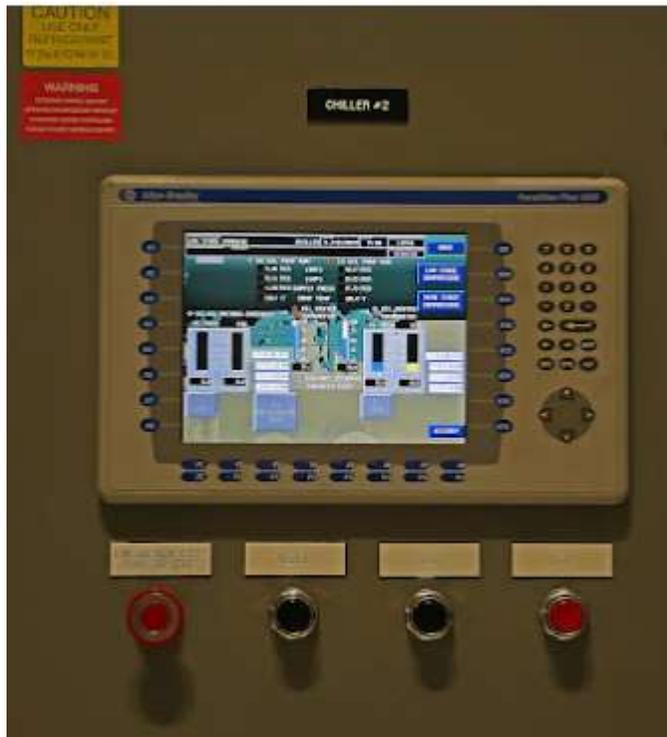


Chiller #2 End Bell Following New Epoxy





New Reclaim Water Piping in Zone 4 Plant



New Flowmeter System for Reclaim Water

