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## **WATER USAGE REDUCTION AT AMBEV'S BREWERY IN UBERLÂNDIA, BRAZIL**

A Major Qualifying Project  
Submitted to the Faculty of the  
Worcester Polytechnic Institute

In partial fulfillment of the requirements for the  
Bachelor of Science Degree in Chemical Engineering

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This MQP contains information deemed confidential to the business interest of the industrial sponsor. Please contact Stephen Kmiatek at [sjkmiatek@wpi.edu](mailto:sjkmiatek@wpi.edu) for additional information.

## ABSTRACT

The largest beer producer in the world, AB InBev, is comprised of several different zones based on location. The Latin American Zone, AmBev, and more specifically, AmBev's brewery in Uberlândia, was the focus of this study. Since its founding in May of 2014, the Uberlândia brewery has guided efforts to aid in the protection of natural resources. One of these efforts is focused on water use reduction, which is monitored by a water consumption index (volume of water consumed/volume of beer produced). The goal of this project was to determine opportunities to reduce this value below their target for competition with global markets. To achieve this, we analyzed data from 2015, leading our focus to the process area of the brewery. For the process area, we developed a water map, detailing all types of water and their flows into and out of the equipment and lines in January 2016. In order to create the map, we observed, quantified, and analyzed Cleaning in Place (CIP) and Sterilization in Place (SIP) procedures. Upon analysis, we also determined steps of the procedures that could be amended or deleted to reduce overall water consumption. Some of these suggestions yielded design recommendations, such as a compressed air tank and a deaerated water reclaim tank. Overall, the proposed amendments to the CIP and SIP procedures would save a significant amount of fresh water in 2016, drastically reducing the plant's water consumption index.