

The following are my contributions to the H₂Ogs Treatment Process for Reusing and Recycling Produced Water in the 2021 WERC Competition. I researched separation methods that could be used including solvent extraction for desalination, hydrocyclones, and coagulation/flocculation. I also designed experiments that were done like what would be looked at under the microscope to determine the morphology of the solids and what concentrations were tested for coagulation/flocculation to determine the best concentration to use in the continuous experiments. I also wrote up procedures for the experiments that were done to ensure that they were done safely in the lab. I was also in charge of calibrating and taking pictures with the microscope that was purchased. I participated in the experiments for the microscope, sand filter, coagulation/flocculation batch wise, coagulation/flocculation continuous, and getting the DAF unit set up. I helped design the continuous apparatus that was used as well as procurement of the equipment for the apparatus. I also helped construct the continuous apparatus together including putting tubing together and putting silicon in the DAF unit to seal the weirs in place. I helped with the sizing of equipment like storage vessels, coagulation vessels, and DAF vessel in the full-scale design. I also communicated with the team to make decisions on what the flow rates of the full-scale design needed to be. I was also in charge of getting the water that was tested analyzed for key parameters and making sure all hazardous waste was disposed of properly. In the report I wrote the Executive Summary, Abstract, and Water Analysis sections. I also wrote parts of the Batch Coagulation, Continuous Coagulation, Full-Scale Design, and Conclusion sections. I also proofread and edited the whole paper multiple times. I also helped design our poster and make sure it had the information that would be useful during our presentation of it. I presented part of the poster to the judges. I also designed my slides for a presentation for the judges and presented those slides to the judges. I also learned how to communicate with others and work as a team to complete a difficult task.