Equipment Replacement for Organic/Aqueous Separation

Overview
GTP asked our team to evaluate their separation process of the organic and aqueous phase in the production of Ammonium Paratungstate. Due to separation issues, GTP was losing profit and materials, while also harming the environment.

Objectives
Our objective was to research modern separation equipment and select the best concept to solve the problem at hand. In addition, GTP requested that we provide a final recommendation that included quotes on the units the team had agreed upon.

Approach
• The team visited the Global Tungsten plant to become familiar with and examine the process
• Customer needs and deliverables were determined through conversations with GTP
• The team researched a multitude of separation methods for the process
• Concept selection eliminated certain options
• A process flow diagram was developed and edited throughout the project
• GTP performed our requested testing and relayed the results
• The team contacted vendors to request quotes on the final recommendations
• The team also outlined future testing for GTP to determine if the final recommendations would benefit the process

Outcomes
Ultimately, the team recommended a coalescing filter unit and a new mixer settler with quotes for GTP to consider installing into their process.
• If installed, a coalescing filter unit would help GTP recycle some of their product and materials, which would decrease material and profit loss
  o The coalescing filter unit would accept a stream from a combined waste tank and separate organic from aqueous on a scale of parts per million
• Also, a new mixer settler unit was recommended to replace an existing unit that was suffering from corrosion