

Alaska Water Sewer Challenge Phase 3

Monthly Progress Report #2

Reporting Period: August 1st, 2016 – August 31st, 2016

Submission Date: September 10th, 2016

Prepared by

University of Alaska Anchorage

Per the professional services agreement, monthly progress reports will include a one page overview of how the monitoring and testing of the prototype is progressing and how the system is working. All major changes done to the system in the ending month and any changes planned for the following month will be disclosed.

System Overview for August 2016

The system operated until August 3rd, 2016 until it was determined based on on-site analyses and visual observations that the wash water was not of suitable water quality. Upon shutdown the wash water had a dissolved organic carbon of over 100 mg-C/L, smelled of soap and soap suds were directly observable. Certified samples were collected on August 2nd, 2016.

To address the water quality issue, the team evaluated options and decided to install a side-stream system to remove soap through production and capture of bubbles. We wrote a blog post about this that can be found at <http://reusewaterak.com/?p=238>. We restarted the system August 22nd, 2016 with the bubble removal system installed.

From restart until end of the month the system operated at reduced pressure with produced water quality at much better water qualities than the prior attempt. During the first full treatment where urine and kitchen sink water was treated a large jump in conductivity and dissolved organic carbon was observed. Further, based on results from our certified lab we changed our sampling practices associated with collection of wash water due our sample being identified as having total coliform.

Considerations for September 2016

We will evaluate the trend associated with increased organics and conductivity originating from treatment of black water. No changes anticipated as of August 31st, 2016.

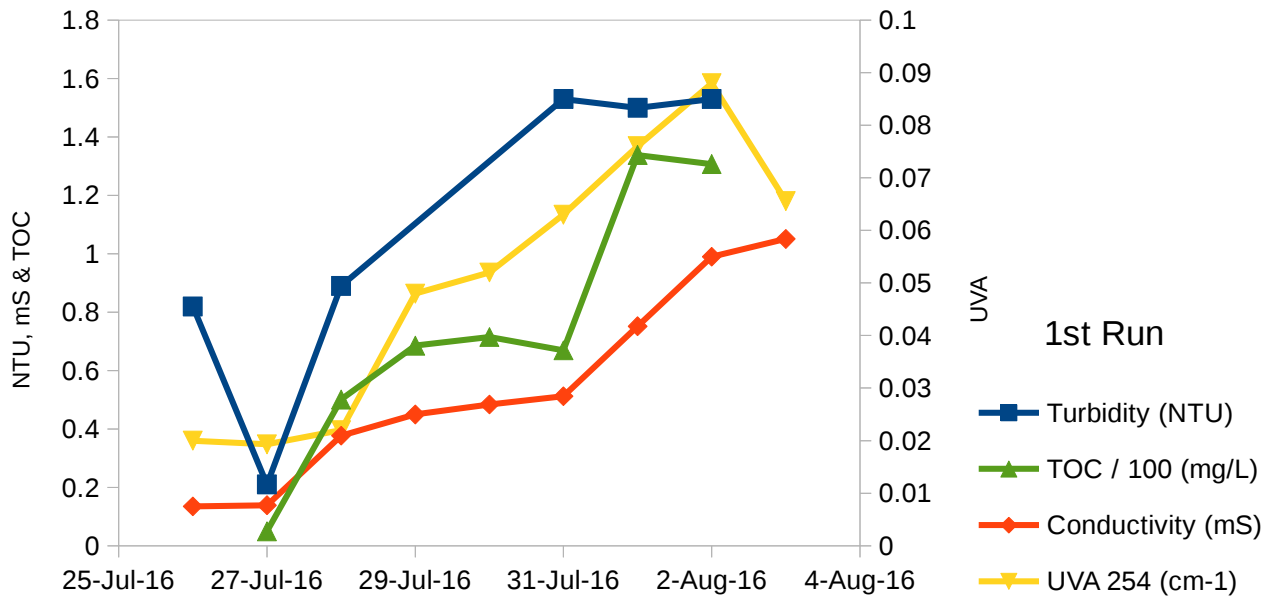
**upon finalizing organic carbon data during the first week of September, our team determined that further modification to our treatment system was required. The figure on the next page illustrates the data support documentation based on data collected and analyzed at UAA. At the point of preparation of this document, modifications are underway and will be detailed upon completion.

General Notice of Data Sharing

All of our data (raw and processed) are being posted publicly as well as all progress reports.

Direct link to website resources: http://reusewaterak.com/?page_id=10

Direct link to data: http://www.reusewaterak.com/data_AWSC

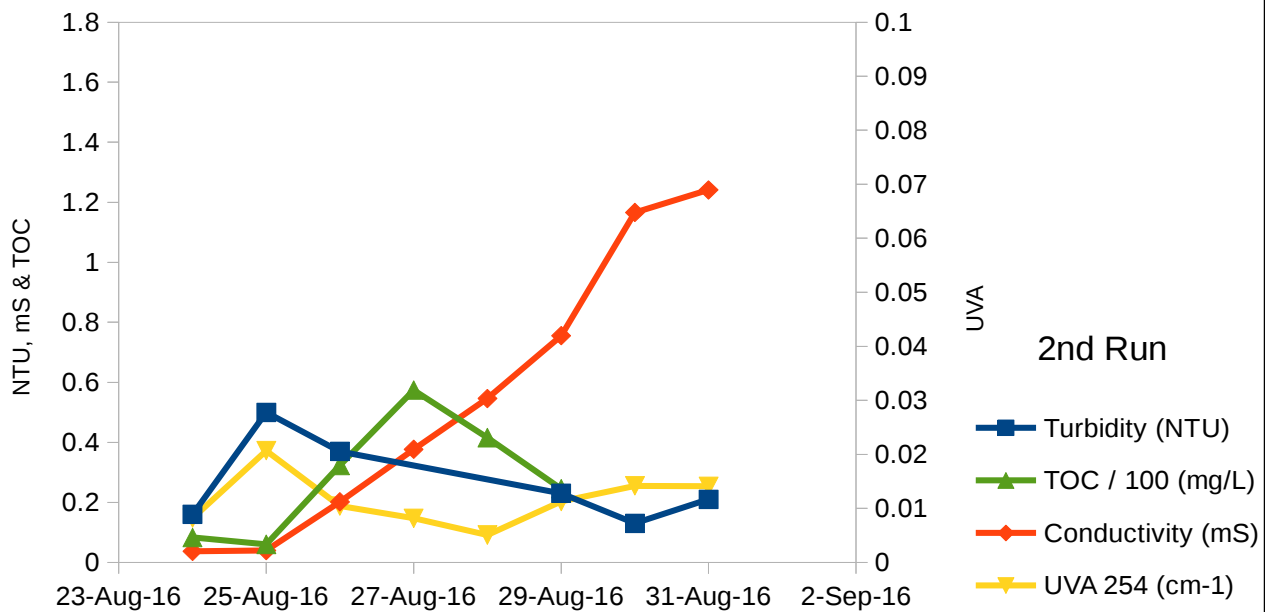


1st Run
 Configuration – As proposed

Finding:
 All water quality parameters rise together

Modification Required due to:
 -Membrane Fouling
 -High TOC in wash water

Proposed Modification:
 -physically remove surfactant



2nd Run
 Configuration – Surfactant Removal

Finding:
 -TOC and Conductivity appear to be derived from synthetic urine associated with reusable black water treatment
 -Acceptable fouling

Modification Required due to:
 -Poor removal of urine constituents

Proposed Modification:
 -remove urine stream
 -reconfigure membrane as 2 stage