

Alaska Water Sewer Challenge Phase 3

Monthly Progress Report #4

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

Submission Date: November 10th, 2016

Prepared by

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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 October 2016

The system operated for the entire month of October with no outages. Further during October, stress scenarios defined by the state were initiated with the “Wash Water Efficiency” stress. Further with the approval of the State project leadership the test dust was changed to one more representative of grey water on October 14th. During this month, treated water turbidity was less than 0.1 NTU for all but four days with a maximum turbidity of just less than 3 NTU. Dissolved organic carbon concentration was less than 1 mg-C/L and ultraviolet transmittance was greater than 99% for all but two days. The stress did not influence treated water quality, we did observe that the stress caused increase bubble production. While water quality was notably better than the contract requirements from a chemical prospective, we identified two sources of ineffective microbial control. These were address through programmatic valve control to avoid cross-connection and addition of an ultraviolet based ozone system to periodically disinfect the wash water tank. After these changes we have observed 0 (zero) MPN/100 mL of total coliforms in our wash water accounting for a greater than 7 log removal of this microbial indicator (greywater tank was determined to have 43,000,000 MPN/100 mL). Additionally, during this month we confirmed that our wash water system requires weekly removal of about 35 gal of concentrated greywater/bubbles and addition of about 35 gallons of makeup water (rain water was used during this period).

Considerations for November 2016 and Future

No changes are planned for November 2016. Evaluation of filter and membrane lifespans suggest that dust remains the most notable challenge for our system. We will operate the system as configured until the end of December to complete all State defined stress scenarios. In January we will replace the existing disposable cartridge filters with a system of particle removal that is cleanable (ceramic microfiltration and enhanced bubble removal). This modification will also reduce the footprint of the treatment system allowing installation in alternative formats beyond the shipping container.

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 photos of water samples: http://www.reusewaterak.com/data_AWSC/daily_photos

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

End-User Interaction

Two members of our team visited Koyukuk on October 14th – 17th and performed work similar to that performed during the visit to Kipnuk in September. Our team is working with our end-user groups to schedule a site visit during January 2017.