



June 27, 2017

MR CRIS SHAW DIRECTOR
APPLETON UTILITIES
2281 MANITOWOC RD
MENASHA WI 54952-8924

Subject: Appleton Water Plant Membrane/UV Transition

Dear Mr. Shaw:

This letter is to acknowledge that Appleton Utilities has successfully completed a several year transition from operating a lime softening/membrane plant to a conventional lime softening plant plus ultraviolet (UV) disinfection. The Department provided comments on an engineering report for the project on September 10, 2013 (Project No. W-2013-0362) and approved plans and specifications on February 14, 2014 (Project No. W-2013-0639).

The project included the following process modifications:

- Upgrading of the GAC contactors to filters including filter to waste piping, waste gullet second barrier wall and second wall between the membrane wet well and contactor wastewater basin.
- New filter aid polymer system.
- Filter performance optimization.
- UV disinfection following filtration for 3-log crypto and giardia inactivation.
- CT tank modifications including increasing the volume and adding baffling to provide 0.5 logs of giardia inactivation under most operating conditions.
- Upgrading the lime feed system.
- Upgrading the aqueous ammonia feed system.
- Upgrading the SCADA system.

A key part of the transition has been to optimize the coagulation and filtration processes. This included adjusting the ferric and lime doses plus the addition of ACH, starting in December of 2015. Full scale demonstration testing has shown softener effluent turbidities over the last year averaging substantially less than 0.2 NTU and maximums no more than 0.8 NTU and normally at or less than 0.2 NTU. Combined filter effluent turbidities over the last year have averaged about 0.025 NTU with maximums normally less than 0.05 NTU. The plant has shown very successful performance, even without the membranes, which were taken off line in August of 2016.

Based on the demonstrated performance of the plant, the Utility has completed all necessary steps to now be considered a lime softening/conventional filtration plus UV plant. Under most conditions, the plant is able to meet the requirements of the Surface Water Treatment Rule (SWTR) without the UV in operation. The UV provides an additional disinfection barrier and provides credits above and beyond the required removal/inactivation minimum requirements. The Utility may decommission the membranes, if desired.

I am attaching an updated Surface Water Treatment Rule (SWTR) Compliance Summary, which has been under development for some time with the great assistance of your staff. The monthly operating report format will now be changed to reflect the current process configuration.

Thanks to you and your staff for your assistance during this transition period.

Sincerely,



Larry B. Landsness, P.E.
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Enclosure

cc: Chris Linskens – NER (by email)
Joe Myers – Plant Manager (by email)
Tony Myers – CH2M (by email)
Florence Olson – DG/5 (by email)