

State of Florida



# Public Service Commission

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COMMISSION  
CLERK

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**DATE:** February 21, 2013  
**TO:** Ann Cole, Commission Clerk, Office of Commission Clerk  
**FROM:** James E. McRoy, Utility System/Engineering Specialist, Division of Engineering  
**RE:** Docket No. 120152-WS; Application for increase in water and wastewater rates in Orange County by Pluris Wedgefield, Inc.

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Attached is letter from the Utility addressed to the Department of Environmental Protection (DEP) in regards to improvement in the Magnetic Ion Exchange (MIEX) system operations. Please place the attached document in the docket file.

Should you have any questions, regarding this matter, please contact me.

Attachment

DOCUMENT NUMBER-DATE

00971 FEB 21 2013

FPSC-COMMISSION CLERK

February 13, 2013

Barbara Browning  
Florida Department of Environmental Protection - Central District  
Drinking Water Section  
3319 Maguire Blvd., Suite 232  
Orlando, Florida 32803-3767

RE: Wedgefield MIEX System Improvements and Ongoing TTHM and HAA5 Results

Dear Ms. Browning,

I have not corresponded with you since the period just after the acquisition of Wedgefield when we had to address the TTHM and HAA5 challenges of the prior owner. I wanted to follow up with you to bring closure to the challenges by letting you know the improvements completed by Pluris since the acquisition have resulted in on-going FDEP compliance relating to TTHM and HAA5.

Operational issues at the Wedgefield water treatment plant prior to Pluris' acquisition of the utility had been the subject of previous discussions and correspondence between Utilities Inc. ("UI"), and Orica Watercare, Inc. ("OWI"), the MIEX manufacturer.

UI at the time of the acquisition was out of compliance with the FDEP in regards to TTHMs and HAA5s. Pluris staff met with OWI to determine why after the construction of the MIEX system, which was constructed primarily to address disinfection by-products that there were any issues with MCL exceedances of TTHMs and HAA5s.

Based on the review we concluded that a number of primarily operational and a few mechanical items contributed to the non-compliance status by the FDEP. These items included;

- 1) The resin inventory was not maintained at a level required to properly operate both trains of the treatment system.
  - a) Low resin concentration increased the resin loss rate and affected system performance as measured by contaminant removal.
  - b) Low resin concentration also complicated the process of maintaining the target regeneration rate, upon which treatment performance depended.
- 2) The automated resin regeneration system had begun showing mechanical problems in the regeneration tank underdrains, and this issue appeared to have been getting progressively worse. This caused several issues.
  - a) This condition made completion of regenerations in automatic mode very difficult.
  - b) Inconsistent MIEX regeneration cycles had shown to result in inconsistent treatment performance, and reduced the system's effectiveness in controlling organic fouling of the MIEX resin.
  - c) This issue has been compounded by interruption of the salt supply for brine making.
- 3) High sulfide content of the raw water had enabled infestation of filamentous bacteria, tentatively identified as a species of the genus *Beggiatoa*. This bacteria is a common occupant of geologic formations where hydrogen sulfide exists. *Beggiatoa* likely inoculated into the MIEX system from one or both water supply wells. The MIEX process provides an environment particularly suited to this bacteria, when release of hydrogen sulfide is not achieved ahead of the resin contactors. Conditions were aggravated when only one train of the system was on-line, due to the reduced surface area provided for release of hydrogen sulfide to the atmosphere. As a result of less frequent resin regeneration as described in 2) above, filament growth among and on the resin itself occurred reducing further the efficiency of the resin.

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- 4) UI did not equip its operating staff with the analytical instruments required to monitor system performance and for responsive process control. The MIEX system was installed to remove dissolved organic carbon ("DOC"), reducing formation of disinfection by-products ("DBPs"). Treatment effectiveness could only be directly monitored with an online DOC analyzer, or indirectly by comparing ultraviolet light absorption ("UVA") of raw and treated water. The operators needed a UV spectrophotometer to monitor system performance and to guide process adjustments and assure regulatory compliance. UI did not want to go to the expense of the UV spectrophotometer.

Following our review corrective actions were begun in the first quarter in 2010 to achieve the following two goals;

- 1) Return the facility to an "in-compliance" status with the FDEP, and
- 2) Initiate permanent ongoing maintenance activities to sustain performance standards.

The corrective activities included the following actions;

- 1) The two water supply wells were taken off line and disinfected to eliminate any contribution of bacteria into the water treatment plant. Periodic sampling and analysis to monitor re-growth of bacteria was established as an operational procedure for periodic disinfection of the wells.
- 2) Underdrain assemblies in the MIEX system were reconfigured with a new improved design to increase efficiency.
- 3) Supplementary on-going training for the current plant operators was provided.
- 4) Resin sampling procedures in accordance with the manufacturer's monthly resin condition monitoring ("RCM"), including testing on all RCM samples received was implemented.
- 5) Pluris procured the adequate resin amount to operate both trains of the MIEX treatment system. Operating the MIEX plant with the proper resin volume was believed to be the primary reason for the TTHMs and HAA5s to have been out of compliance with FDEP. Pluris also believed that using the proper volume of resin would provide greater process stability, as well as better dissipation of hydrogen sulfide.

At the time the improvements were made, the TTHMs and HAA5s exceeded the MCL of 80 µg/l and 60 µg/l respectively. Pluris believed it would require several quarters to reduce the aggregate levels to below the MCLs but that monthly values would all be less than the MCLs.

Presented in the following table is a time line of the performance following the improvements completed as described above.

Quarter Ending	Owner	TTHM Prior Quarter Results (µg/l)	HAA5 Prior Quarter Result (µg/l)
June, 2009	Utilities Inc	105.0	42.0
September, 2009	Utilities Inc	120.0	68.0
December, 2009	Utilities Inc	129.0	71.0
March, 2010	Pluris	74.2	48.0
June, 2010	Pluris	62.1	55.9
September, 2010	Pluris	69.8	45.3
<b>Subsequent to Quarterly Tests</b>		<b>Annual TTHM (µg/l)</b>	<b>Annual HAA5 (µg/l)</b>
September, 2011	Pluris	55.2	38.2
September, 2012	Pluris	56.5	39.8
February, 2013	Pluris	45.7	51.8

The last test result for February was a voluntary test. Pluris wanted to perform a test during the winter season in addition to the upcoming 2013 compliance testing. The chain of custody and laboratory sheet for the February test are attached with this letter. Note that the residual chlorine was 0.8 mg/l at the time of the test sampling for the TTHM and HAA5 samples.

In conclusion, since the acquisition in early 2010, Pluris has maintained the FDEP compliance levels for both TTHMs and HAA5s. This has been accomplished by the improvement in both operating procedures as well as some minor modifications to the MIEX system to allow better contact between water and resin.

We trust the FDEP is satisfied with Pluris's performance through the process. Should you have any questions, please do not hesitate to contact either myself or Mr. Joe Kuhns, regional manager.

Sincerely,

A handwritten signature in black ink, appearing to read "Maurice W. Gallarda", with a long horizontal flourish extending to the right.

Maurice W. Gallarda, PE  
Managing Member and Principal Engineer