

**LIFT Scholarship Exchange Experience for Innovation & Technology (SEE IT)**  
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**TRIP REPORT**

**SCHOLARSHIP UTILITY:** City of Fort Collins

**SCHOLARSHIP UTILITY CONTACT:** Lincoln Mueller, Project Manager, lmueller@fcgov.com

**ATTENDEES:** Lincoln Mueller, Warren Barlow, Jason Aragon

**TRIP DATES:** September 23- 25, 2019

**UTILITIES/SITES VISITED:**

Little Patuxent Water Reclamation Plant, Howard County, MD  
Liverpool Wastewater Treatment Plant, Medina County, OH

**TECHNOLOGIES/INNOVATIONS SEEN:**

- MagPrex (aka Airprex) Phosphorus Precipitation Technology

**TRIP BACKGROUND and RATIONALE:** In 2018, the City of Fort Collins went through a process selection for the reduction of phosphorus in the Drake Water Reclamation Facilities effluent before January 1, 2021. After a trip overseas to review two different sidestream processes, the City selected the Airprex process. As the design progressed into 2019, plant staff kept tabs of the construction and startup of the first two Airprex processes in the US located in Maryland and Ohio. Before construction got too far along, plant staff wanted to meet with the operators and maintenance people at Liverpool and Little Patuxent to query them on construction lessons learned and start up and commissioning issues.

**TRIP SUMMARY:**

***Why did you select the specific utility and technology for the visit?***

Both Little Patuxent and Liverpool had just commissioned the first Airprex systems in the US and we wanted to visit them to hear about their lessons learned prior to completing our construction. As far as the selection of the process, several members of team had previously traveled to Europe to evaluate two of phosphorus precipitation systems used there, selecting Airprex and the most mature technology at the time.

***On your visit, do you think this technology/approach works for your utility?***

Yes, while we were able to see the challenges presented in several aspects of the process, the actual phosphorus precipitation was significant enough to move forward.

***How useful was the trip in your decision-making process?***

Since we had already selected the process we wanted, the trip was a success in that we were able to learn from both plants several items in the construction, commissioning and operation that made our commissioning and operation much smoother.

***What were some of the trip highlights and takeaways?***

1. Access to the reactors was not standard and we modified our ladder system to a spiral stairway for safety.
2. The platform access at the top of the reactors was fairly small. We extended our walkway to provide more working area and safety around the equipment.
3. Per Maryland's recommendations we accommodated for the insulation in our vertical piping systems, facilitating the installation of insulation and heat trace.
4. Maryland had significant issues with their struvite pump due to hair and clogging. We changed our pumping system to include a macerator and used a pump not as susceptible to jamming up with the hair.
5. While we were not able to install struvite harvesting, Liverpool's discussion about pipe routing and washing helped us to set up our process building layout to accommodate struvite harvesting in the future.
6. Discussing some of the programming integration issues that Liverpool experienced helped us to prepare for the same issues when the vendor came onsite for our integration.

## City of Fort Collins Airprex Summary Report

### **Little Patuxent Water Reclamation Plant, Howard County, Maryland**

The review team departed Denver on September 23, 2019 and arrived at Baltimore around lunchtime. Checked in with the Little Patuxent Water Reclamation Facility the morning of September 24, 2019 and had a sit down meeting with Robert Hindt and his team. Discussed the following:

1. Their plant averaged 18-20 MGD, approximately 20% higher than DWRF (our plant)
2. Came online in March 2019 but have struggled with new digesters
3. Discussed allowing more flexibility in programming. A wider span of control with MgCl<sub>2</sub> and air dosing. Operator controlled limits were a must.
4. The struvite pump was the biggest maintenance issue. Hair clogging and over-torque.
5. Issues with controlling foam. They have had to reduce air. One problem is limited overflow capacity (not an issue at DWRF, overflows to same location as normal)
6. Test for OP 3 times a week for dosing. Molar ratio started at 1.3, now down to 1.0





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### Liverpool Wastewater Treatment Plant, Medina County, Ohio

On the evening of September 24, 2019, the team traveled to Cleveland Ohio via air and stayed the night. The next morning, we drove to Liverpool Wastewater Treatment Plant in Medina County, Ohio. After a detailed tour of the plant. The Airprex system was only one part of a multi-phase upgrade to Liverpool to handle the County's digestible solids. We discussed the differences in performance they were seeing with their thermophilic digestion system. The plant's biogas generators and food waste receiving, and processing were very impressive. They had not been experiencing the foaming issues of Maryland but were still trying to get the struvite harvesting system operational. The last part of the meeting involved discussions about programming and the pros and cons of using the vendor program versus the plant programming.





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