

# Smart Water at Blue Plains AWTP



February, 2018 Elkin Hernandez, DC Water

## Overview of Blue Plains AWTP

- 391 mgd average day capacity
- ~160 acres
- Serves DC, plus areas of MD and VA
- Advanced secondary treatment filtration, N and P removal
- Discharges to Potomac River and Chesapeake Bay





### Using Existing Data Multimedia Effluent Filters

Multi Media filters are being used as the last part of waste water treatment to remove small floating particles form the wastewater. Uses Multiple media, under drains, backwash waster and air. Backwash process approximately once every 24 hours



Blown filter is described as an structural defect that would let the fluid pass media without being filtered (shortcut) and the media to be released and enter the backwash water during backwash. Caused by rupture of the underdrains



## Multimedia Effluent Filters

An opportunity to deploy analytics using historical data going back to 2009. One of the approaches was Matlab with the support of the University of Cincinnati.

#### DATA PREAPARATION

- Perform Data Collection
- Identify Data Ranges and Failures
- Define Data Structure
- Perform Initial Analysis
- Perform Data Clean Up

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#### **Feature extraction**

- Time-domain statistical parameters
- Frequency-domain features
- Time-Frequency domain



#### Analysis

- Feature Selection
- Failure Signature
- Health Assessment



### Multimedia Effluent Filters

Filter 1 south that was reported blown on Jan 17<sup>th</sup> 2016. As the group comparison for head loss shows, the filter had an abrupt change in its behavior from early December causing CV values to drop. Backwash flow CV suggests similar behavior in the same time proximity. Using the final health metric for this filter, the warning and failure alarms would raise by Dec 5<sup>th</sup> and 6<sup>th</sup>, one 40 days before the failure was noticed.





## Vertical Assets Applications

#### - Asset Health monitoring

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- Energy Management

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## **Conclusions and Lessons**



### District of Columbia Water and Sewer Authority



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water is life

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