



**APOLLO**

# City of Haverhill Driving Efficiencies at Wastewater Treatment Plant Using Digital Platform and AI

## Haverhill, MA WWTP

### Background

Average flow of 10 MGD with a peak flow of 65 MGD during wet weather. Treatment includes coarse screening, aerated grit removal, fine screening, septage processing, three primary clarifiers, two diffused aeration basins and one surface mixer aeration basin; three secondary clarifiers and disinfection using sodium hypochlorite.

Solids processing include two gravity thickeners; a pair of dissolved air flotation thickeners, a blend tank and dewatering using centrifuges. Off-site disposal is handled by trucking. Daily 11 dry tons of sludge is processed.

## Project Objective

### Request for Proposal

Aquasight's APOLLO real-time artificial intelligence platform was selected by Massachusetts Clean Energy Center (MassCEC) to demonstrate innovative wastewater treatment technologies with potential to reduce energy demand, recover resources such as heat, biomass, energy or water.

## APOLLO Digital Platform

### Solution

The platform combines real-time process data, lab data, design constraints, equipment condition, standard operating procedures, weather forecasts, and artificial intelligence models. It provides real-time smart advice such as optimal air supply, pumping operations, and polymer dosage to minimize costs while meeting or exceeding NPDES permits.



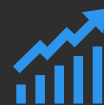
### Levers & % Reduction

15.7% less energy costs  
7.8% less chemical costs  
3.9% less trucking costs



### Annual Energy Savings

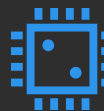
69 kW less power  
605,000 less kWh  
24 less truck loads



### Annual Cost Savings\*

\$185,000 annual recurring  
\$2,394,000 capital leverage

\* potential



### Apollo AI Processing

650M data points annually  
processed via Apollo  
AI engine



APOLLO

# Creating Digital Legacy To Retain and Pass On Knowledge To New Workforce

## Enriching Workforce

### Creating a Digitally Savvy Workforce

Several APOLLO modules were implemented that include Influent Pumping, Activated Sludge, Secondary Clarifiers, Plant Water and Dewatering - Centrifuges.

APOLLO has become the digital buddy for plant operations and senior management to understand the optimal performance of the plant 24x7 and compliment SCADA automated control.

The digital platform sits side by side to SCADA in a control room or on an executive tablet for performance review and audit by looking back in the history through its high performance decode analytics.

The platform's secondary objective is to digitally enhance the workforce by retaining the knowledge of experienced operators and helping train new workforce by instilling on an operationally efficient and cost-conscious mindset.

### APOLLO Insights Lead to Energy and Dollar Savings

- Efficient influent pumping operation and capacity monitoring
- Smart aeration operations based on real-time blower capacities, incoming sewage prediction models & deck ops intelligence
- Intelligent RAS operation using real-time state point guidance, SVI and MLSS forecasting
- Enhanced plant water pumping using optimal pressure management and pump degradation intelligence
- Smart dewatering centrifuge operations with optimal advice on dosing, torque, differential speed using feed sludge, capture efficiencies and cake solids predictive models

*" The Aquasight platform is driving a more capable workforce. Asset intelligence and efficiency insights are invaluable to the wastewater treatment process. Having real-time analytics beyond what SCADA gives us is a game changer for senior management and operations staff "*

**ROBERT WARD**  
Director, Department of Public Works  
City of Haverhill, MA