


# WATERHUB®at Philip Morris USA

The WaterHub® at Philip Morris USA (PMUSA) is an eco-engineered wastewater reclamation and reuse system operating in Richmond, Virginia. This facility is designed to intercept and reclaim industrial wastewater from the Fortune 100 and FDA Regulated manufacturing complex and reuse treated effluent for utility purposes on-site. The facility can produce 650,000 gallons per day of Level 1 Reclaimed Water per State of Virginia standards. The WaterHub® is the primary water supply for a district-energy system with 23,300 tons of refrigeration capacity.

## ABOUT $H_2O$ INNOVATION

$H_2O$ Innovation is a pioneering designer and manufacturer of membrane systems, specializing in water, wastewater, and water reuse treatment for municipal and industrial customers.



**Location**
Richmond, Georgia

**Hydarulic capacity**
650,000 Gallons per day

**Client**
Philip Morris

**Commercial Operation**
Summer 2019

**Footprint**
Building 8,200 ft²
Storage Tank: 1,200 ft²
160,000 gallons

**Project Type**
Campus-Scale Wastewater Reclamation & Reuse

**Capital Model**
Water Processing Agreement

Now sitting on the site of a former coal-fired power plant, the WaterHub® is a symbol of an industrial park's turn to green infrastructure. The system is expected to decrease total potable water use for the park by approximately 40% and decrease total wastewater discharge by up to 70%. Moreover, the system is designed to reduce risk of manufacturing center downtime by providing a redundant (n+1) source of makeup for critical utility (cooling tower makeup and chiller makeup) operations.

The full project scope includes approximately 6,000 linear feet of water conveyance and distribution piping in addition to 160,000 gallons of clean water storage. The facility contains a full-service water testing laboratory, operator offices and a conference room for staff and guests. System operations are highly automated, leveraging cloud based state-of-the-art SCADA and 24-hour remote monitoring capabilities. The $H_2O$ Innovation WaterHub® team ($H_2O$) will provide long-term operational and maintenance services for the system through a Water Processing Agreement

## TECHNOLOGY & DESIGN

The WaterHub® at PMUSA is an eco-engineered wastewater reclamation and reuse system that combines natural treatment techniques with the latest membrane filtration, disinfection, and deionization technologies. With increased microbial biodiversity, WaterHub® (hydroponic) treatment systems provide a more resilient biological process design, with reduced energy profiles, a compact physical footprint, and reduced biosolid production. With a lush, natural system aesthetic, full odor-control and automated operational features, the WaterHub® is specifically designed for integration into a variety of settings.

The hydroponic reactors, found in the glasshouse, utilize plants and their root systems to mimic and maximize natural treatment efficiencies associated with oxygen diffusion and habitat creation. The full process design of the WaterHub® at PMUSA includes: primary screening, pre-anoxic, aerobic, hydroponic and post anoxic reactors, submerged membranes, dual-disinfection (UV + Chlorine) and a sidestream reverse osmosis system to achieve the highest level of recycled water treatment in Virginia (Level 1) and meet stringent utility reuse requirements.

### Effluent Design

| Parameter | Max Load Influent (mg/L) | Max Load Effluent (mg/L) |
|---|---|---|
| BOD | 356 | <5.0 |
| Turbidity | n/a | <2..0 |
| TSS | 410 | <2..0 |
| TKN | 40.0 | <1.0 |
| TP | 8.0 | <0.3 |

### Outdoor Hydroponics



### 160,000 Galloons Reclaimed Storage Tank




