

Regional Wastewater Treatment Facility Biological Nutrient Removal (BNR) Upgrade

Client: Clearfield Municipal Authority, Clearfield County, PA

Year: 2017 Cost: \$37,000,000



Gwin, Dobson & Foreman designed one of the state's largest and most technologically advanced BNR wastewater projects for the Clearfield Water Authority. This \$35 million project employs a unique step-feed process for treatment of wet-weather flows while preserving BNR bio-mass. The Clearfield wastewater treatment plant was upgraded and expanded under the following criteria:

Capacity & Process Parameters

- Capacity: 4.5 MGD (ADF); 16.0 MGD (Maximum Month); 25 MGD (Peak)
- Permitted Nutrient Discharge Concentrations – 6.0 mg/l (TN) and 0.80 mg/l (TP)

Treatment Goals

- Permitted Annual Mass Loading Limits: 82,191 lbs. (TN)/10,959 lbs. (TP)
- Capacity Expansion for Previously Bypassed Wet-Weather Flows (6 MGD to 25 MGD)

Unit Operations and Process Systems

- Headworks Building with Fine Screens and Vortex Grit Separators
- Suspended Growth Nutrient Removal Technology configured for Hybrid Stage 5-Bardenpho, Virginia Initiative Plant (VIP) and Ludzack- Ettinger Processes
- Oxidic Zone Aeration System (Turbo Blowers)/Anoxic-Anaerobic Zones Mixing System (submersible pumps)
- Fine Bubble Membrane Diffuser System and Submersible Mixers
- Reactor Feed Distribution Box with Gravity Step Feed System for Wet Weather Flows
- Final Clarification using Spiral-Blade Collection Mechanism and Stamford Baffles
- Return Pumping for Return Activated Sludge, Mixed Liquor Suspended Solids and Nitrate Flow
- Ultraviolet Disinfection and Cascade Aeration Channel



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- Solids Handling – Conversion of Anaerobic Sludge Digesters to Aerobic Digestion with Sludge Storage, Belt Thickener, Centrifuge Dewatering, Biosolids using Agricultural Land Application