



TETRA TECH

complex world | CLEAR SOLUTIONS™

# Wastewater Services

Global Leaders in the Science, Engineering, and Construction of Wastewater Solutions

WATER

NATURAL RESOURCES

ENVIRONMENT

INFRASTRUCTURE

ENERGY



# Global Reach – Local Service



Tetra Tech's global network of professionals deliver clear solutions to our clients' complex wastewater challenges. Tetra Tech provides sustainable solutions to our clients, applying our proven understanding of science, regulatory requirements, state-of-the-art technology and financial options.

## Highlighted Projects



### MANAGEMENT CONSULTING AND ASSET MANAGEMENT FOR PASCO COUNTY, FL

Pasco County's reclaimed water rate structure consisted of a flat monthly rate paid by residential users. In order to continue participation in the Southwest Florida Water Management District's alternative water supply grant program and promote water conservation, the County hired Tetra Tech to prepare a rate study that shifted the County's rate structure. A base plus consumption model meets their goals while recovering adequate revenue to meet system needs.



### SAVING MONEY AND ENERGY WHILE SETTING STANDARDS IN FRESNO, CA

When the 70+ MGD wastewater treatment plant in Fresno, CA, experienced settleability issues, Tetra Tech was requested to assist. Tetra Tech worked with city staff to devise an innovative approach that improved biomass settleability and provided significant cost and energy savings. Rather than running a typical dissolved oxygen near 2.0 mg/L, 0.1 mg/L was used. This allowed a reduction in applied aerator horsepower of approximately 29%.



### WATER REUSE FOR FOUNTAIN VALLEY WATER DISTRICT, CA

The Groundwater Replenishment (GWR) System Program in Orange County, CA, reuses 70,000 acre-feet per year of advanced treated wastewater. GWR takes treated wastewater from the Orange County Sanitation District, purifies it by microfiltration, reverse osmosis, and ultraviolet disinfection. The water is injected into the groundwater basin where it percolates into deep underground aquifers. It is then pumped out of the basin and distributed as potable water by local water purveyors. GWR also prevents seawater intrusion into the county's groundwater basin.

Treatment facilities are operated 24/7 for decades with limited budgets for upgrades and expansions. Tetra Tech provides operations support through the life of your treatment plant to meet changing needs and objectives.

### TRAINING AND EDUCATION

A unique component of Tetra Tech's consulting services is client-specific and classroom-based training. Tetra Tech trainers and consultants provide training in many areas including, but not limited to, activated sludge control and biological nutrient removal. This training is designed to go further than typical wastewater operator training programs by delving into the difficult subject of controlling the biological process. We give students and clients an in-depth understanding of the microbiology of the system and how to control the growth of the microorganisms.

### ENERGY AND PROCESS OPTIMIZATION

With most wastewater and reclaimed water treatment plants, there is significant money to be saved in energy and chemical costs. At Tetra Tech, we work with clients to optimize their treatment processes. Process evaluations can lead to not only a reduction of energy costs, but often a reduction of chemical costs and increased compliance with regulations. Our leading experts can provide assistance with optimization of treatment processes, saving energy and allowing for the reinvestment of savings.



**MEMBRANE BIOREACTOR SOLUTION IN CATLETTSBURG, KY**

Facing more stringent discharge limits for arsenic, metals, and organics, as well as challenges handling solids at their wastewater treatment plant at their Marine Repair Facility, Marathon Petroleum worked closely with Tetra Tech to characterize the oil barge-washing waste stream, negotiate with regulators, design a membrane treatment solution, procure the equipment, and provide construction-phase and start-up services. The membrane bioreactor facility was completed on time and within budget and has been operating as designed, meeting discharge limits.



**SCADA EFFICIENCY IMPROVEMENTS IN LANSING, MI**

Tetra Tech developed a Dissolved Oxygen (DO) Optimization system for the City of Lansing Wastewater Division, including a new software program for aeration basin inlet and blower inlet valves that incorporated pressure settings and optimum DO levels in the program's logic. With the new Aeration Control Algorithm in the SCADA system, the city can more accurately control overall DO levels in the aeration basins. It also lowered overall electrical costs significantly by automatically throttling the aeration blower inlet valves.



**BIOSOLIDS MASTER PLAN FOR YPSILANTI, MI**

Tetra Tech can help turn biosolids—organic materials left at the end of the wastewater treatment process—into assets for agricultural and renewable energy markets through planning, research, and best practices in biosolids engineering. Our expertise also includes permitting and designing facilities. Tetra Tech prepared a biomass master plan for the Ypsilanti Community Utilities Authority in Michigan and designed the most advanced biosolids incinerator system in the United States. It received the national ACEC Honor Award for Engineering Excellence.

**TETRA TECH** is a leading provider of consulting, engineering, program management, construction, and technical services addressing the resource management and infrastructure markets. The Company supports government and commercial clients by providing innovative solutions focused on water, the environment, and energy. With approximately 12,000 employees worldwide, Tetra Tech's capabilities span the entire project life cycle.

## Wastewater Capabilities

### CONCEPTUAL AND PLANNING PHASE SERVICES

#### Master Planning

- Asset Management
- Flow Management
- Facility Planning
- Capital Improvement Planning
- Regulatory Compliance
- Septic System Surveys & Management Planning
- Sustainability Planning

#### Management Consulting

- Rate Studies
- Financial Planning
- Security
- Threat & Vulnerability Assessments
- GIS-Based Maintenance Planning

### ENGINEERING AND DESIGN PHASE SERVICES

#### Collection and Transmission

- Sewer System Evaluation Surveys
- Flow Monitoring
- Infiltration & Inflow Studies
- Sewer Rehabilitation & Restoration
- Large Diameter Force mains
- Lift Stations
- Booster Pumping Facilities
- Hydraulic Modeling
- Reclaimed Water Transmission & Distribution
- Alternative Collection Systems

#### Instrumentation and Control Systems

- SCADA
- Integration
- Remote Status & Control
- Data Management & Trending Analysis

### Treatment Facilities

- Flow Equalization
- Sedimentation
- Biological Nutrient Removal
- Activated Sludge
- Sequencing Batch Reactors
- Membrane Bioreactors
- Moving Bed Bioreactors
- Fixed Film Processes
- Oxidation Ditch Technology
- Aerated Lagoons
- Disinfection & Dechlorination
- Energy Recovery Systems
- Nutrient Recovery Systems
- Small Community/Decentralized Systems
- Soil Dispersal/Aquifer Recharge
- Constructed Wetlands
- Water Reclamation
- Membrane Treatment of Secondary Effluent
- Process Evaluation & Optimization

### Biosolids Management – Class A/B Biosolids Programs

- Dewatering & Thickening
- Composting & Pelletization
- Incineration & Land Application
- Anaerobic & Aerobic Digestion
- ATAD

### Odor Control

- Biological
- Chemical
- Air Ionization

### Organics Management

- Anaerobic Digestion & Power Generation
- Animal Waste Management
- Co-Digestion of Solid Wastes & Biosolids

### Operator Training

- Process Control
- Troubleshooting
- Microbiology
- Biological Nutrient Removal

### Plant Optimization

- Comprehensive Performance Evaluations
- Energy Efficiency
- Composite Correction Programs

### Sustainability Services

- Energy Audit/Optimization
- LEED Services
- Energy Recovery & Zero Energy Design

### CONSTRUCTION PHASE SERVICES

#### Construction Management

- Resident Engineering Services
- Program Management
- Owner's Representative Services
- Design-Build Delivery
- CM-at-Risk Delivery
- Performance Testing Services
- Start-Up & Training Services
- Facility Commissioning

**TETRA TECH**  
Rankings

- 1<sup>st</sup> in Water
- 1<sup>st</sup> in Treatment & Desalination
- 1<sup>st</sup> in Transmission Lines & Aqueducts
- 3<sup>rd</sup> in Dams & Reservoirs
- 5<sup>th</sup> of Top 200 Environmental Firms
- 7<sup>th</sup> of Top 500 Design Firms

### COMPANY FACTS

Annual revenue of USD \$2.2 billion (FY10)

Publicly traded on NASDAQ (TTEK)

Geographic reach of 330 offices worldwide (195 in the U.S.)

#1 in Water by ENR 8 years running

### GLOBAL PRESENCE

North America: Canada, United States Europe: France, Germany, United Kingdom  
Asia: Afghanistan, China, India, Japan, Kazakhstan, Philippines, South Korea, Thailand  
Pacific: Australia, Guam Latin America: Chile Middle East: Qatar, United Arab Emirates



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### CORPORATE HEADQUARTERS

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