



National Risk Management Research Laboratory

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Water Quality Research Program

Providing Research Solutions to Manage Water Quality

The Test and Evaluation Facility Cincinnati, Ohio

Introduction

The Test and Evaluation Facility (T&E) is located on the grounds of Cincinnati's Mill Creek wastewater treatment plant. There, scientists and engineers in the Water Quality Research Program in EPA's National Risk Management Research Laboratory conduct studies on new treatment technologies for contaminants in water and wastewater. This unique facility has a high-bay area for bench-, pilot-, and full-scale research. It is supported by analytical laboratories, chemical storage, and office space.

A wide variety of innovative water, wastewater, and soil/sediment treatment technologies and environmental monitoring and control systems are conceived, designed, fabricated, and evaluated at T&E. Innovative environmental management concepts may be subsequently field-validated and nationally applied. T&E researchers verify water security monitoring and treatment technologies as part of EPA's Environmental Technology Verification Program.

Administered by NRMRL, T&E is managed by a highly experienced EPA technical team. The team is complemented by Shaw Environmental, Inc. and its subcontractors (University of Cincinnati, Miami University, etc.).

Background

Designed in 1977 and opened in 1979, T&E is a multipurpose research facility in Cincinnati, Ohio. The research encompasses drinking water treatment, wastewater treatment, and hazardous waste, soil, and ground water remediation. T&E is a two-story building with 33,000 square feet of space subdivided into 16 work areas. It was designed with functional versatility for future use.

Under the Resource Conservation and Recovery Act, T&E is a permitted treatment, storage, and disposal facility that holds an Ohio EPA treatability exclusion. This exclusion allows the facility to conduct treatability studies using quantities of all categories of hazardous waste. This is unmatched by any similar facility in the nation.

Features

T&E is a ventilated, fully heated and lighted facility. Its features include:

- Wastewater flows to the 16 experimental locations in the 24,000-square-foot high-bay area
- Two 5-ton bridge cranes for ease of relocating large pieces of experimental equipment
- A well-equipped, 700-square-foot machine shop for fabricating specialty items and building or repairing experimental apparatus

- A 275-square-foot greenhouse for agricultural studies of pollutant application to soils
- 10,000 gallons of stainless steel tank storage; drum storage areas for twenty 55-gallon drums
- Hazardous waste tank leak and spill monitoring and alarm capability tied into an automatic facility shutdown system

To allow for installation and removal of experimental equipment and units, several large rollup doors facilitate the movement of trucks and large equipment, including trailer-mounted pilot plants, in and out of the building.

T&E is equipped with:

- Chlorinated, dechlorinated, and deionized water supplies
- Low- and high-pressurized air supplies
- Electrical supply (110, 240, 480 volts)
- Analytical chemistry laboratories (2,000 square feet)
- Chemical storage area
- Hazardous liquid and solid storage facilities
- Liquid pumping systems
- Environmental chambers
- Office space (5,800 square feet)

The on-site chemistry laboratories give scientists the flexibility to study:

- Phytoremediation
- Drinking water contaminants
- Biosensors (devices that determine the concentration of substances and other biological parameters of interest)
- Small systems (public water systems serving fewer than 10,000 people)
- Water distribution systems, using two water distribution system simulators

The T&E facility may be used by scientists and engineers from other federal agencies, academic institutions, nonprofit organizations, and private companies. Provisions are in place to ensure that EPA research will not be impacted by any agreements. In most cases, EPA will provide in-kind services and contractor support for studies at the T&E facility.

Objectives

EPA's objectives are to reduce the risk to public health, ensure clean and safe drinking water, and enhance science and research. T&E research supports these by conducting leading-edge, sound scientific research that reduces human exposure to contaminants in drinking water.

The Water Quality Research Program conducts research at T&E to develop technologies and strategies for controlling and monitoring drinking water contaminants, including microbial pathogens and inorganic and organic chemicals. The primary areas of research at T&E are:

- Drinking water and the Contaminant Candidate List
- Bio-monitoring
- Package plants (technologies packaged together to provide an affordable solution for small-system operators who may not otherwise be able to efficiently treat water)
- Distribution systems
- Remote monitoring demonstrations

Specific contaminants are also investigated to determine treatment and analytical alternatives.



Results

Research conducted at T&E has led to technologies and strategies for controlling and monitoring drinking water contaminants, including microbial pathogens and inorganic and organic chemicals.

Drinking water and wastewater studies at T&E support EPA regulations and provide regulators and utilities with environmental results. Studies promote the development and commercialization of practical and innovative technologies that enhance drinking water quality. T&E provides diverse opportunities to convert drinking water and wastewater research into solutions for public water systems in the United States.

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Water Quality Research Program
<http://www.epa.gov/ORD/npd/waterqualityresearch-intro.htm>



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