Groundwater, Watershed and Ecosystem Restoration Division (GWERD)

United States Environmental Protection Agency

Robert S. Kerr Environmental Research Center
Ada, OK

Office of Research and Development

National Risk Management Research Laboratory
R. Richard Lowrance

Pre-EPA

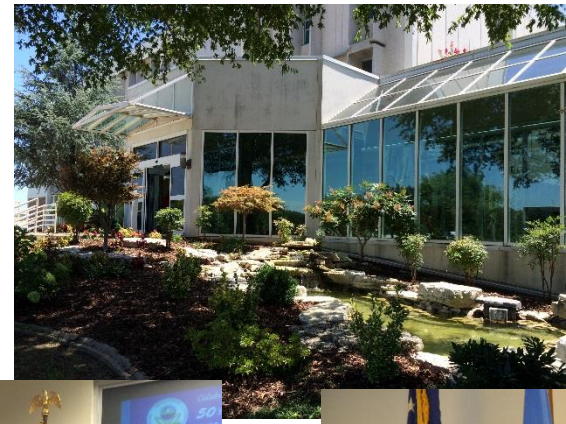
Robert S. Kerr Environmental Research Laboratory dedicated in 1966 as part of the Federal Water Pollution Control Agency.

Became part of US EPA when Agency was formed in 1970. Grew to international prominence as *the center* for groundwater research in EPA.

EPA United States Environmental Protection Agency

1966-2017

The Robert S. Kerr Environmental Research Center celebrated our 50th anniversary last year



EPA United States Environmental Protection Agency

Mission

Conduct scientific research and provide technical assistance to develop strategies and technologies to protect and restore our nation's groundwater, surface water and ecosystems.

Focus is on site remediation, groundwater quality and ecosystem restoration research

Our Mission

Support EPA's mandates with science.

1972 – Clean Water Act (CWA)

1974,1986 and 1996 – Safe Drinking Water Act (SDWA)

1976 – Resource Conservation and Recovery Act (RCRA)

1980 – Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

1986 – Superfund Amendments and Reauthorization Act (SARA)

Complex Problems

Science to meet EPA's evolving mandate.

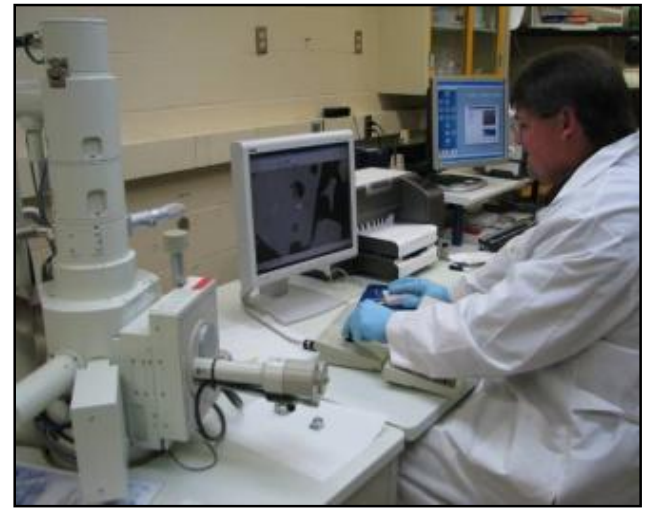
1980s – Challenges to groundwater quality that integrate multiple scientific fields:

Chlorinated solvents such as Benzene, MTBE and TCE

Arsenic and chromium

Nitrate and other excess nutrients

Many of the sites are *Superfund and RCRA*



Complex Problems

Science to meet EPA's evolving mandate.

1990s – Ecosystem Management and Restoration added to the Division's research mission:

Riparian Ecosystems

Stream Restoration

Groundwater/surface water interactions

Nitrogen and Phosphorus Pollution

Confined Animal Feeding Operations

Photo courtesy of USDA NRCS.

Evolving Mission

Science to meet EPA's evolving mandate

21st Century – Continuing to refine the work of the Center with the evolving approaches needed by EPA ORD to meet its mission:

Hydraulic Fracturing Retrospective Case Studies

Indirect Waste Water Treatment Plant Discharges

Contaminated Sites

Green Infrastructure

Nano-materials

Research to Support Solutions

- **Conduct research to address problems with groundwater contamination and ecosystem degradation**
- **Problems require multi-disciplinary investigation and diverse teams (Field, Laboratory, Modeling)**

People

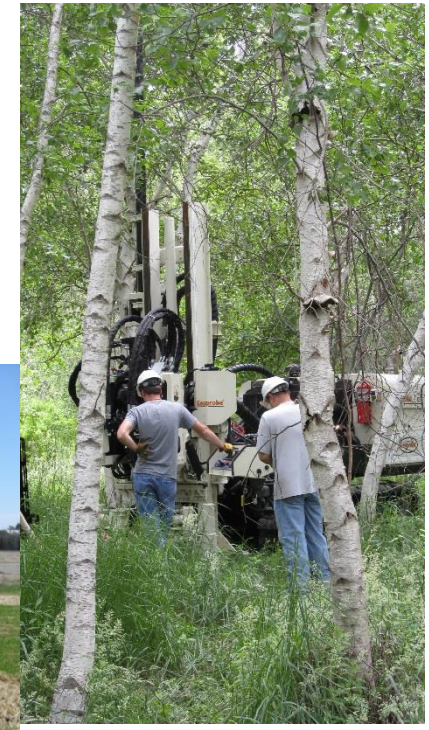
- **Federal employees (42)**
  - Chemists
  - Ecologists
  - Environmental & Chemical Engineers
  - Geochemists
  - Geologists
  - Hydrologists
  - Microbiologists
  - Modelers
  - Soil Scientists
- **On-site contractors and grantees (~60)**
  - Post docs
  - Students
  - IT/IM
  - Library
  - Maintenance/Security
  - Senior Environmental Employment Program

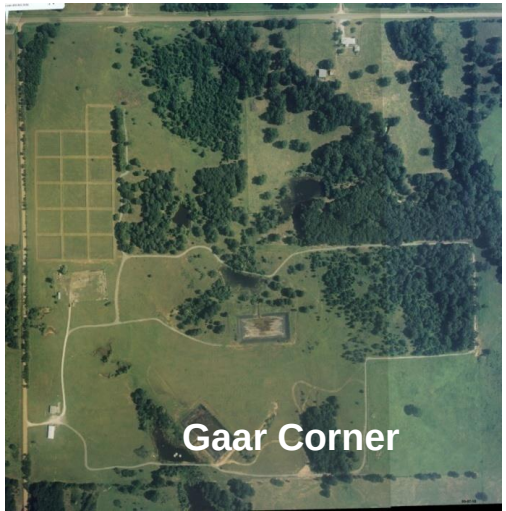
Robert S. Kerr Environmental Research Center

- 16 acre footprint was part of the Senator Kerr home place
- Buildings: 92,000 gross square feet
- 58,000 usable square feet
- Also houses administrative element of ORD, Region 6 and USGS employees
- Specialized laboratories for chemical analysis, hydraulics, hydrology, microbiology and scanning electron microscopy
- Specialized equipment for subsurface investigations
- 109 acre field site about 11 miles away in western Pontotoc County

GWERD

- **Field Capabilities**
  - Well drilling, monitoring
  - Field soil, subsoil and aquifer sampling
  - Site characterization
  - Stormwater gaging and sampling
  - Experimental design
- **Gaar Corner Field Research Facility**
  - Ecological research
  - Testing/calibration of field equipment
  - Demonstration site





ORD National Research Programs

United States Environmental Protection Agency

Air, Climate & Energy

- Global climate change
- Air pollution

Sustainable & Healthy Communities

- Ecosystem services
- Human health
- Sustainable materials management

Homeland Security

- Water system security
- Decontamination of buildings

Chemical Safety for Sustainability

- Green chemistry
- Computational toxicology
- Nanotechnology

Human Health Risk Assessment

- Risk assessments for specific chemicals
- Risk assessment methods

Safe & Sustainable Water Resources

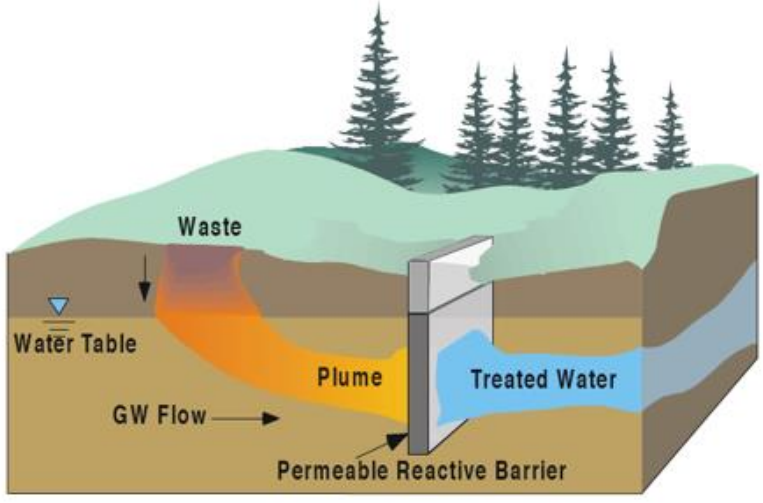
- Green infrastructure
- Drinking water treatment systems
- Surface water quality

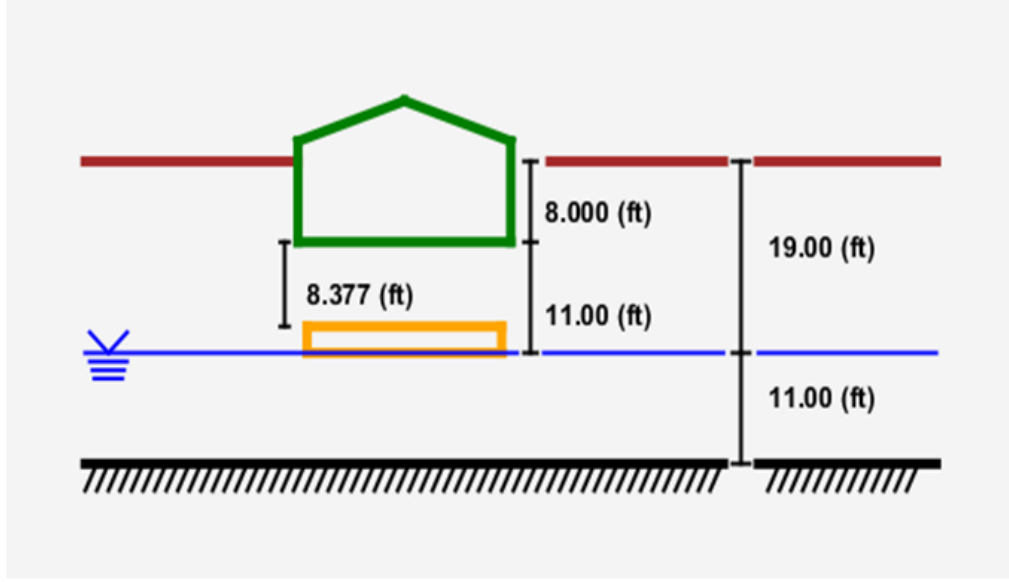
Safe and Clean Water

- **Watershed Integrity – Modeling tools, Aquifer exemption**
- **Nutrients – Nitrate in groundwater**
- **Ecosystem Restoration**
- **Drought and Extreme Events**
- **Enhanced Aquifer Recharge**
- **Green Infrastructure Effects on Groundwater**
- **Contaminants of Emerging Concern in Stormwater**

Protecting Communities

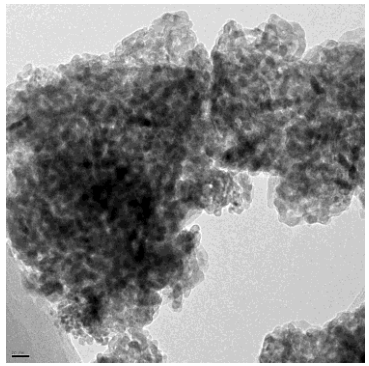
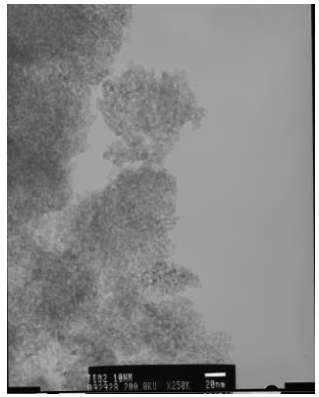
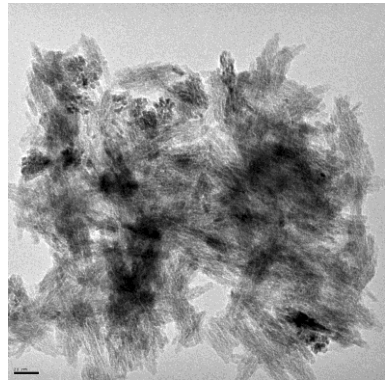
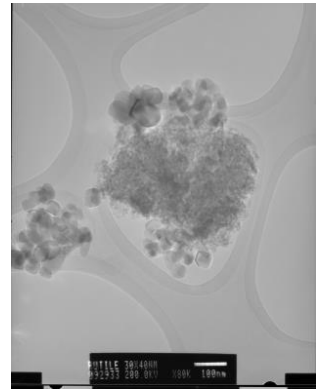
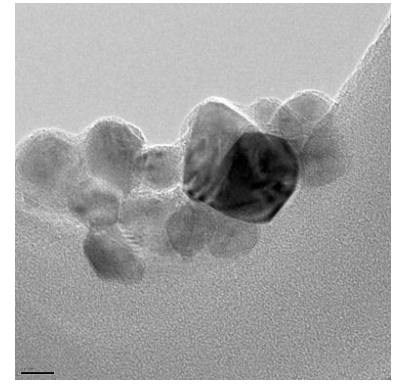
- **Technical Support to EPA Regions and States for Superfund and RCRA**
- **Innovative Remediation Technologies**
- **Contaminated Site Remediation**
- **Leaking Underground Storage Tanks/Oil Spills**





Chemical Safety

- **Nano-materials Fate and Transport**

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