

Comprehensive Management of Unconventional Water

OBJECTIVES

This eight-day course provides a comprehensive understanding of the life cycle of water in the energy industry and best management practices (BMPs) employed by industry. The course will first give an overview of hydrogeology and subsurface fluids, followed by discussion of water use, water production, fluid injection, water quality, water treatment, and water reuse fundamentals. Participants should walk away from the course with a breadth of understanding on issues and challenges for water management in the energy industry.

ABOUT THE INSTRUCTOR



Kyle E. Murray, Ph.D.

Kyle E. Murray has worked as a Hydrogeologist at The University of Oklahoma (OU) since 2011. His research on water management and reuse in the oil and gas industry has led to numerous speaking engagements on water management at academic and industry conferences in the USA, China, and Argentina. Prior to joining OU, Dr. Murray was an Assistant Professor at the University of Texas at San Antonio (UTSA) where he taught Hydrogeology, Engineering Geology, Geographic Information Systems (GIS), and GIS for Water Resources courses. He also taught a GIS for Water Resources short course in Almeria, Spain multiple times in the 2004 to 2010 timeframe. His current projects include produced water quality data compilation, recoverable element research, treatment of hydrocarbons and dissolved solids from produced water, and geological sequestration of carbon-based fluids.

CONTACT


JACK ZEDLITZ
jzedlitz@ou.edu

Director of Professional Development
Ronnie K. Irani Center for Energy Solutions
University of Oklahoma

YOANA WALSchAP
ywalschap@ou.edu

Consultant
Ronnie K. Irani Center for Energy Solutions
University of Oklahoma

 /ICES
 
 @OU_ICES
  @OUIRANICENTER

 LINK.OU.EDU/EIAOKLAHOMA

COURSE OUTLINE

DAY 1 Hydrogeology (3 hours)

- Groundwater Resources
- Groundwater Terminology
- Physical Hydrogeology
- Chemical Hydrogeology
- Groundwater Contamination and Remediation

DAY 2 Subsurface Fluids (3 hours)

- Water and Energy Terminology
- Base of Treatable Water
- Petroleum Reservoirs
- Subsurface Waters
- Fluid Maturity and Migration
- Reservoir Water Quality

DAY 3 Water Use at Well Sites (3 hours)

- Water Sourcing for Well Drilling and Completion
- Water Transport, Handling, and Storage
- Water Formulation for Hydraulic Fracturing
- Flowback Management

DAY 4 Produced Water Volumes (3 hours)

- Reservoir Porosity and Permeability
- Well Construction and Water Productivity
- Electric Submersible Pumps
- Water Production Trends

DAY 5 Produced Water Quality (3 hours)

- Total Dissolved Solids
- Major Inorganic Constituents
- Recoverable Elements and Critical Minerals
- Naturally Occurring Radioactive Materials (NORM)

DAY 6 Underground Injection Control (3 hours)

- Secondary Recovery
- Tertiary Recovery
- Saltwater Disposal
- Injection-Induced Seismicity

DAY 7 Flowback and Produced Water Treatment | Pre-Treatments (3 hours)

- Hydrocarbon Removal
- Passive versus Active
- Thermal Treatment Technologies
- Membrane Treatment Technologies
- Polishing Treatments

DAY 8 Water Reuse (3 hours)

- Clean Brine and Biocides
- Reuse for Hydraulic Fracturing
- Resource Recovery
- Beneficial Reuse