



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Groundwater Program Status

Dennis Mayton
DOE Groundwater Program Manager, P.G.
Oak Ridge Office of Environmental Management

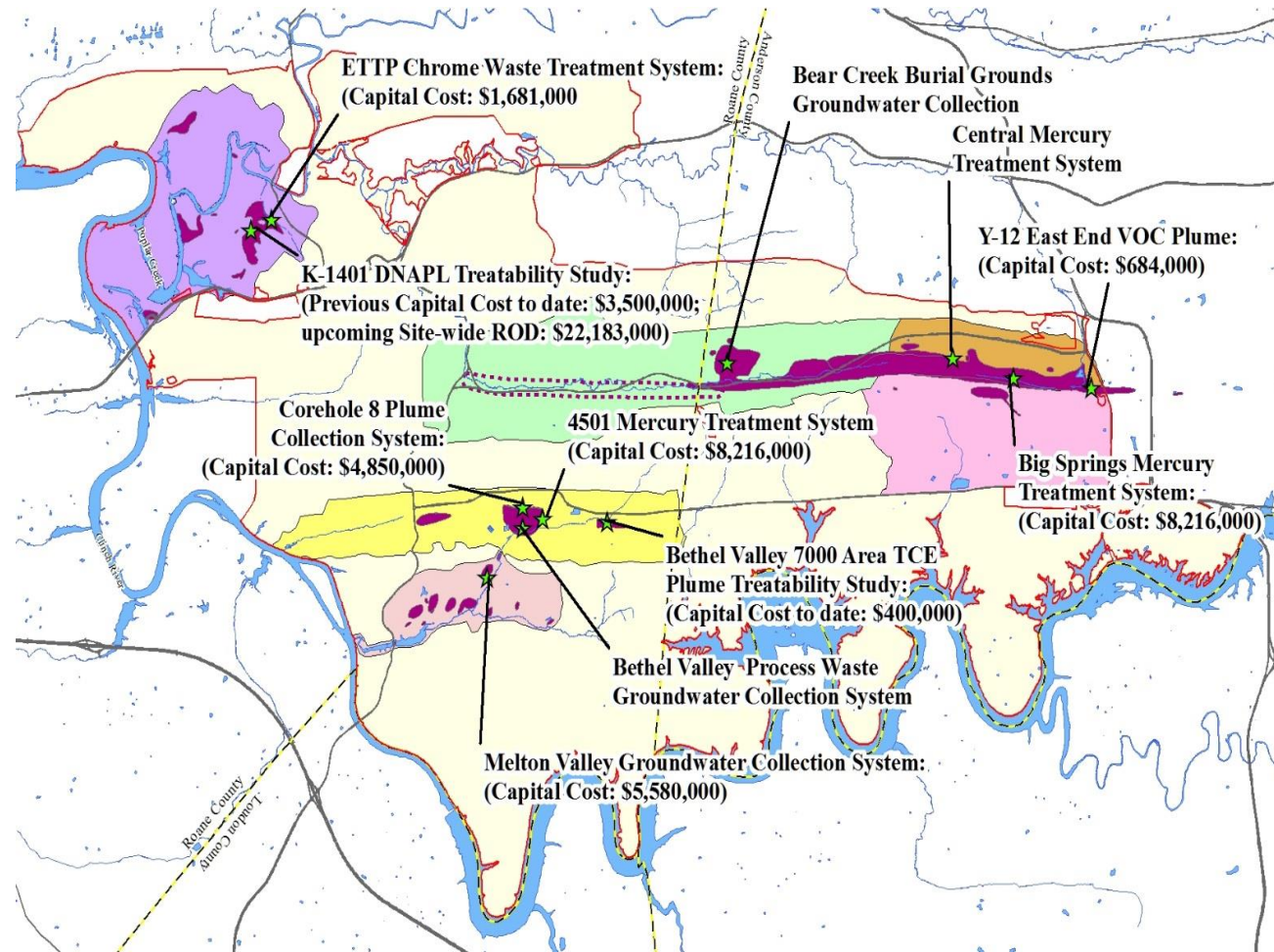
OREM has an extensive program in place to manage groundwater challenges

- Groundwater investigations underway since the 1980's
 - Burial grounds
 - Industrial spills
- Existing groundwater wells
 - Y-12: 547
 - ORNL: 996 (offsite 23)
 - ETTP: 452
- Annual monitoring
 - Groundwater well sampling: >700
 - Groundwater elevation level readings: ~1,400
 - Surface water sampling: ~1,750
- Results documented yearly in Remediation Effectiveness Report on March 30
- Annual budget to support water quality program requirements: ~\$12 million



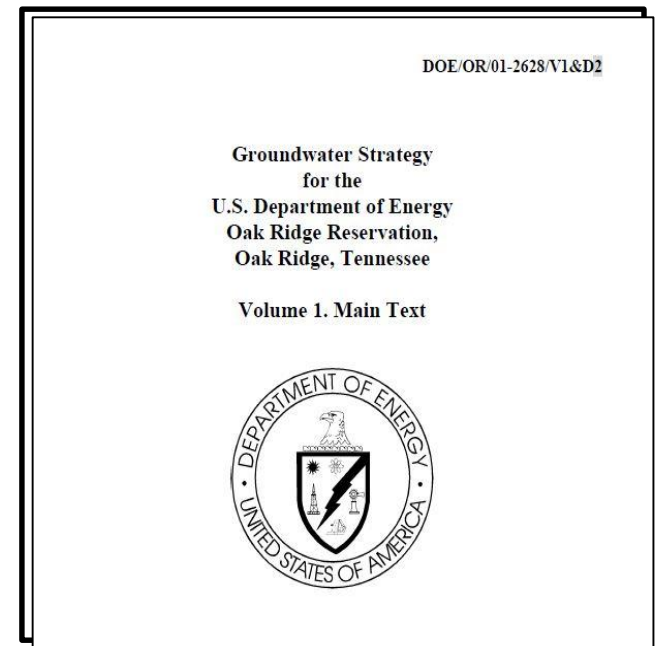
Multiple groundwater treatment systems have been designed and installed to manage groundwater plumes

- Nine collection/treatment systems to address most major sources
- Construction costs to date: \$33M
- Surveillance & Maintenance of systems: >\$3.5M annually

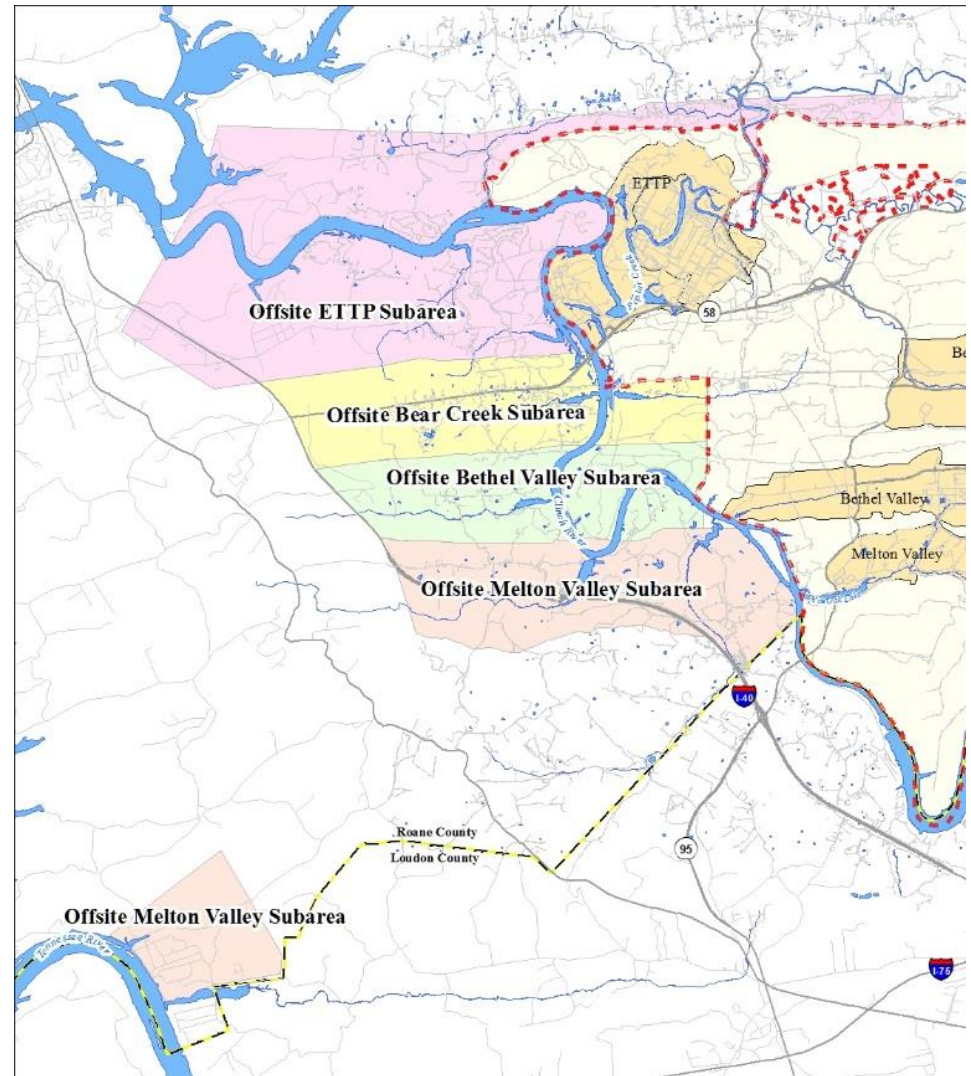


DOE, EPA, TDEC are working on a path forward for managing legacy groundwater challenges

- Workshops held with regulators in 2013
- Agreement to collaborate on implementation of new projects
 - Investigations
 - Engineered restoration
- DOE/EPA/TDEC agreement on Groundwater Strategy document in 2014
- Understanding potential offsite migration has been the highest priority
- Agreed to provide additional funding to base Groundwater Water Restoration Program/Facilities Operations budget to support new activities
- Agreed to develop regional groundwater model



- Top-ranked project: Offsite Groundwater Assessment
- Currently paying to supply public water to 40 private residences
- Remedial Site Evaluation Work Plan approved in 2014
- Conducted site visits and obtained access agreements
- 49 locations (34 wells, 15 springs) were sampled in four offsite subareas



Completed groundwater sampling events and lab analyses

- First Sampling Event FY15 Q2 (43 locations)
 - Three locations showed exceedances of U.S. EPA National Primary Drinking Water Standards: lead at one location, lead and gross alpha activity at second location, and combined radium -226 and -228 activity at third location
- Second Sampling Event in FY15 Q4 (48 locations)
 - No exceedances of U.S. EPA Drinking Water Standards
- Third Event (Confirmatory Sampling) FY16 Q2 (18 locations)
 - No exceedances of U.S. EPA Drinking Water Standards
- Low concentration detections of other contaminants that were sporadic and discontinuous



Remaining steps to complete groundwater assessment this year

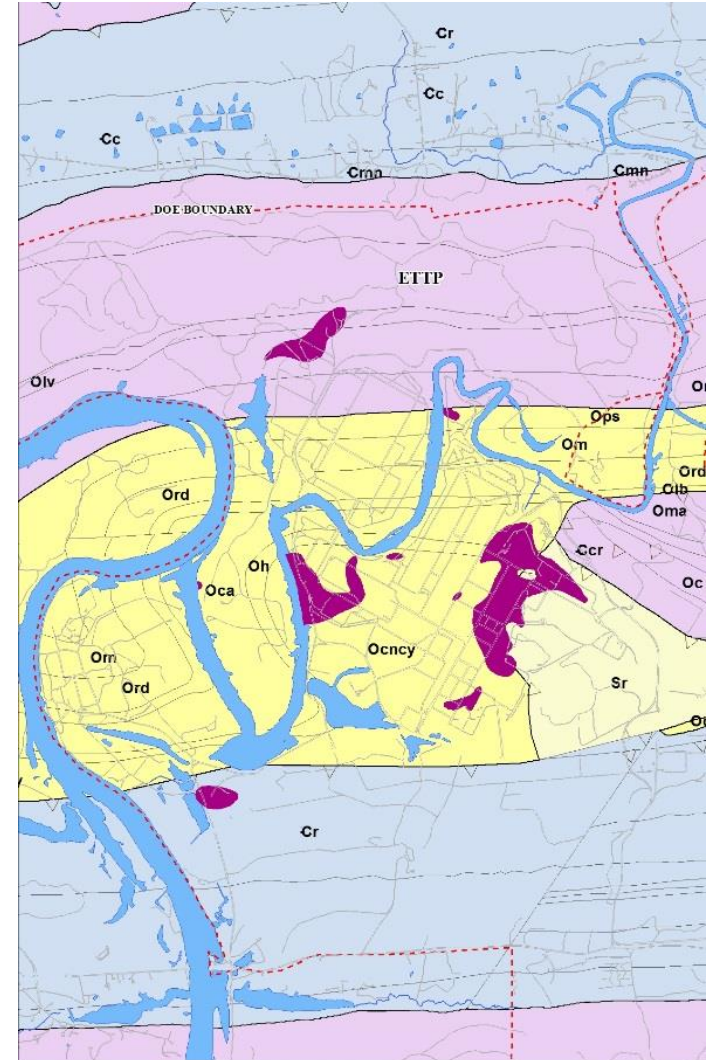
- Offsite Remedial Site Evaluation Report submitted November 15, 2016
- TDEC and EPA currently reviewing document
- Co-sampling new offsite and background locations with TDEC

	FISCAL YEAR															
	14				15				16				17			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Offsite Groundwater Assessment																
Gather data/DQO	█	█														
RSE Work Plan		█	█	█												
FY 2015 Q2 Sampling						█										
FY 2015 Q4 Sampling								█								
FY 2016 Q2 Confirmatory Sampling										█						
RSE Report (D1 and D2)										█	█	█	◆	█	█	

◆ FFA Milestone (D1 RSE Report)

DOE, EPA, and TDEC will make first large-scale groundwater decision at the East Tennessee Technology Park

- Groundwater remedial investigation conducted 1997-1998
- 452 permanent monitoring wells in place
- Groundwater Treatability Study underway at K-1401 to evaluate active restoration via in-situ thermal treatment
 - Cost to date: \$3.5 million
 - Cost to complete: \$15 million
- Remedial Investigation/Feasibility Study will be updated
- Proposed Plan will be prepared
- East Tennessee Technology Park Final Site-wide Record of Decision will address 11 of the 35 Oak Ridge Reservation plumes
- Current ROD milestone is 2023, pushing for 2021
 - Estimate to complete: \$22.2 million



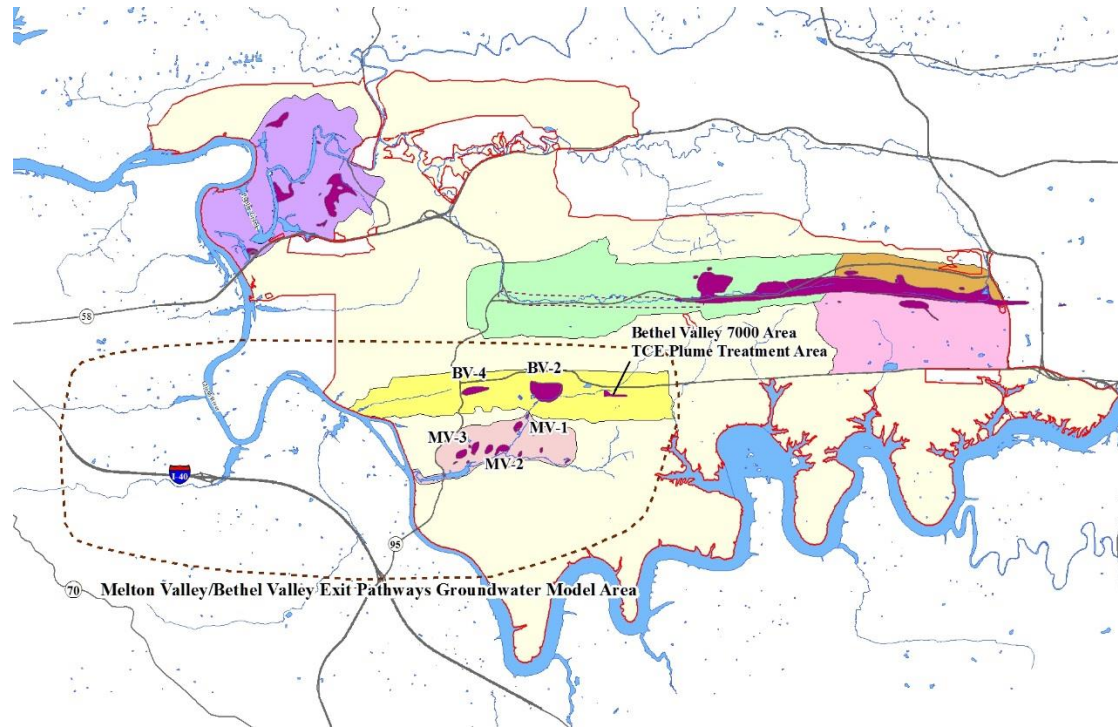
OREM is exploring options for the remediation of spilled liquid solvents

- Remaining Design Characterization: ~\$5M
- If constructed, estimated cost for treatability study for one plume is \$10M
- System would involve thermal delivery system combined with vapor extraction and treatment



Potential future groundwater projects are under evaluation

- Melton Valley/Bethel Valley Exit Pathway Investigation
 - Gather data on behavior of hydrofracture site, burial grounds, and Corehole 8
- 7000 Area Trichloroethylene Plume Remediation
 - Follow up on successful treatability study with bio remediation



Questions?