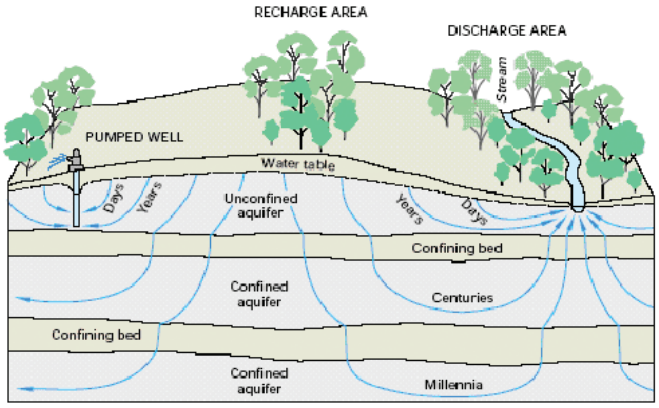
ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

# Are People Who Live Near The Oak Ridge Reservation Exposed To Contaminated Off-Site Groundwater?

## What did ATSDR conclude about exposures to contaminated off-site groundwater coming from the Oak Ridge Reservation?

People who live near the Oak Ridge Reservation (ORR) want to know if they are being exposed to contaminated groundwater coming from the ORR (for example, from drinking well water). The Agency for Toxic Substances and Disease Registry (ATSDR) conducted a public health assessment to evaluate these potential exposures. ATSDR concluded that, based on sufficient evidence, no human exposures to contaminated groundwater outside of the ORR boundary have occurred in the past, no exposures are currently occurring, and exposures are not likely to occur in the future. Since nearly all of the groundwater beneath the ORR ends up as surface water before leaving the site, community exposure to contamination from groundwater off site is unlikely. The only confirmed contaminated groundwater area that extends outside of the ORR boundary originates from the Y-12 complex. However, there are no private wells pumping groundwater in this vicinity. Therefore, **ATSDR concluded that there are no completed exposure pathways for drinking or contacting off-site groundwater.** In addition, the nearest residential wells (located more than 2 miles from the Y-12 complex) have been sampled and are unaffected by groundwater contamination resulting from ORR activities.



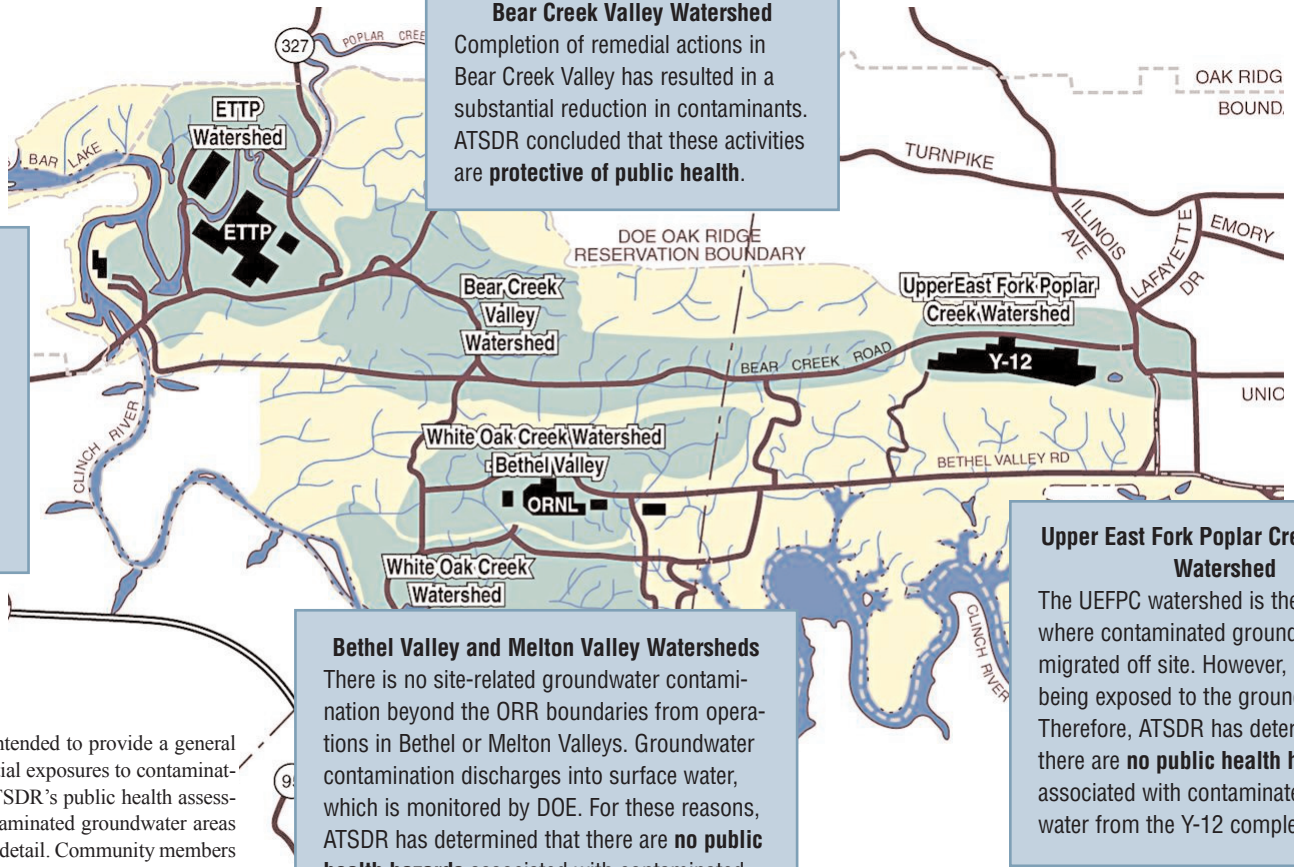

Flow times from points of recharge to points of discharge can range from days to millennia. At the ORR, shallow groundwater has short flow paths with relatively quick travel times to surface water.

***Although extensive groundwater contamination exists throughout the ORR, ATSDR concluded that there is no public health hazard from off-site exposure to contaminated groundwater coming from the ORR.***

ATSDR also examined the possibility of vapors from the groundwater contaminants entering an office building that partially overlies the contaminated groundwater area outside of the ORR boundary. Conservative modeling estimated indoor vapor concentrations of the contaminants to be below levels of health concern.

The 1997 Interim Record of Decision for Union Valley ensures that the public's health is protected while final remedial actions are being developed and implemented. If necessary, it identifies and/or prohibits future activities that could increase the rate of movement of the contaminated groundwater, or increase the size of the contaminated area. ATSDR concluded that these plans are protective of public health to the extent that they limit or prevent current and future community exposure to contaminated groundwater in Union Valley. Treatment of the contaminated groundwater in this area began in June 2000.

## What is ATSDR's summary of exposure to contaminated off-site groundwater in the ORR's watersheds?




**Bear Creek Valley Watershed**
Completion of remedial actions in Bear Creek Valley has resulted in a substantial reduction in contaminants. ATSDR concluded that these activities are **protective of public health**.

**East Tennessee Technology Park (ETTP) Watershed**
Groundwater contamination at ETTP does not migrate off site; rather, it is discharged into surface water, which is monitored by DOE. ATSDR has determined that there are **no public health hazards** associated with contaminated groundwater from ETTP.

**Bethel Valley and Melton Valley Watersheds**
There is no site-related groundwater contamination beyond the ORR boundaries from operations in Bethel or Melton Valleys. Groundwater contamination discharges into surface water, which is monitored by DOE. For these reasons, ATSDR has determined that there are **no public health hazards** associated with contaminated groundwater from ORNL.

**Upper East Fork Poplar Creek (UEFPC) Watershed**
The UEFPC watershed is the only area where contaminated groundwater has migrated off site. However, no one is being exposed to the groundwater. Therefore, ATSDR has determined that there are **no public health hazards** associated with contaminated groundwater from the Y-12 complex.

Note: The information presented here is intended to provide a general overview of ATSDR's evaluation of potential exposures to contaminated off-site groundwater from the ORR. ATSDR's public health assessment describes the assessment of the contaminated groundwater areas in each of the ORR's watersheds in greater detail. Community members interested in additional information on ATSDR's review of the potential exposures to off-site contaminated groundwater from the ORR are encouraged to read the public health assessment.

## What potential exposure pathways did ATSDR evaluate?

Since off-site groundwater contamination only occurs in the area immediately east of the Y-12 complex in Union Valley, this is the only area where exposures were evaluated. ATSDR identified three possible exposure scenarios to the groundwater contamination present outside of the ORR boundary.

### Exposure Scenario #1: Withdrawing groundwater for personal use from private groundwater wells.

Since the land in this area is zoned for industrial purposes, there are no residences. As a result, there are no private wells in use in this area. In fact, the quarry near the eastern end of Union Valley is the only place groundwater withdrawal is occurring. Contamination has never been detected in the quarry groundwater. Therefore, no one is being exposed to the groundwater through the use of private wells.

### Exposure Scenario #2: Directly contacting groundwater at seeps or springs.

Due to the shallow water table at the ORR, the interconnectivity of the groundwater with the surface water, and natural attenuation processes like dilution and biodegradation, the groundwater is generally less contaminated by the time it reaches the surface water. The measured concentrations of groundwater contaminants in the seeps or springs were below levels of health concern. Furthermore, since the land overlying the contaminant plume is zoned as industrial, the potential for human contact is infrequent or accidental. Therefore, it is highly unlikely that anyone is coming in direct contact with contaminated groundwater at seeps or springs.

### Exposure Scenario #3: Inhaling vapors while working in the office building that overlies the off-site groundwater contaminant area.

An office building, just east of the Y-12 complex, partially overlies the off-site contaminated groundwater area. As a result, there is a potentially complete exposure pathway for the inhalation of contaminant vapors from the groundwater. Therefore, ATSDR evaluated the possibility of contaminant vapors entering into the workspaces within the office building. Based on currently available data and the results of conservative modeling, the estimated contaminant concentrations were determined to be below levels of health concern.

## What are ATSDR's main findings?

❖ Although extensive groundwater contamination exists throughout the ORR, ATSDR scientists have concluded that there is **no public health hazard** from exposure to contaminated groundwater originating from the ORR. This conclusion category is used for sites that, because of the absence of exposure, do not pose a public health hazard.

***ATSDR has determined that there are no completed exposure pathways for ingestion or direct contact with contaminated off-site groundwater.***

❖ ATSDR concluded that it is unlikely that contaminated groundwater at the ORR will flow beneath, and continue to flow away from, streams and rivers that surround the site. Almost all groundwater beneath the ORR ends up as surface water before leaving the site boundary.

## Who is ATSDR?

ATSDR is the principal federal public health agency charged with evaluating the human health effects of exposure to hazardous substances in the environment. Congress created ATSDR to implement the health-related sections of the 1980 Superfund law and other laws that protect the public from hazardous waste and environmental spills of hazardous substances.

### What is ATSDR doing at the Oak Ridge Reservation?

People living near the ORR want to know if they are being exposed to contaminants originating from the ORR. ATSDR conducts public health assessments to determine whether people in communities living near the ORR were, are, or will be exposed to contaminants that moved off site from the reservation. ATSDR accomplishes this goal by evaluating previous studies and available environmental and monitoring data, as well as demographic and current and historic land use information. The public health assessment is the primary public health process that ATSDR uses to:

- ***Identify*** off-site populations who could have been exposed to hazardous substances,
- ***Determine*** the potential health effects of exposure,
- ***Address*** the health concerns of people in the community, and
- ***Recommend*** any necessary follow-up public health actions to address exposure.

In addition to the evaluation of off-site groundwater exposures, ATSDR scientists are conducting public health assessments on the following issues related to the ORR:

- Mercury releases from the Y-12 plant
- Uranium releases from the Y-12 plant
- TSCA incinerator
- PCBs
- Screening for current chemical exposures
- Uranium and fluoride releases from the K-25 site
- Iodine-131 releases from the X-10 site
- Radionuclide releases from the X-10 site to White Oak Creek

### Where can I get copies of ATSDR's evaluation of potential exposure to off-site groundwater contamination? Also, where can I find out about what else ATSDR is doing at the ORR?

#### *Visit one of our records repositories*

The records repositories are located at the Oak Ridge Public Library, the Department of Energy Information Center in Oak Ridge, the Harriman Public Library, the Kingston City Library, Roane State Community College, and the Rockwood Public Library. These repositories have copies of all reports that ATSDR has completed to date, along with reports completed by other agencies.

#### *Visit the ATSDR Web site*

The ATSDR web site has links to past publications, schedules of future events, and other information of interest. The ATSDR web site is: *http://www.atsdr.cdc.gov.*

#### *Contact ATSDR directly*

Residents can contact ATSDR representatives directly by calling the agency's toll-free number, 1-888-42ATSDR (1-888-422-8737); Jack Hanley, MPH, ATSDR Environmental Health Scientist (404-498-0358); or Marilyn Palmer, ATSDR Health Communications Specialist (404-498-1751).