

# Exposure to Contaminants in Drinking Water and Indoor Air

## Paden City Groundwater Site, West Virginia



The Agency for Toxic Substances and Disease Registry (ATSDR) evaluated past and current levels of tetrachlorethylene, also known as perchloroethylene (PCE), and related contaminants. This evaluation considered whether drinking water and breathing indoor air, that contains contaminants related to the release of PCE, might harm people's health. This fact sheet summarizes ATSDR's findings and recommendations.

**ATSDR assessed all contaminants detected in Paden City drinking water and indoor air, which represent exposures through June 2023. Residents are not expected to experience harmful health effects from short- or long-term exposures to the detected contaminants, including PCE and associated substances, that were identified in currently available data. Further assessment of the contaminant plume and the vapor intrusion pathway is needed.**

Paden City Groundwater Site, located in Paden City, WV, was added to the National Priorities List (NPL) on March 16, 2022. The site was listed due to the underground area of contaminated groundwater and soil, also known as a contaminant plume, that has the potential to cause harm to Paden City residents and its environment. The NPL is the list of sites with known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. Under the Comprehensive Environmental Resources Conservation Act (CERCLA), ATSDR is required to perform a public health evaluation for sites added to the NPL.

### A Summary of ATSDR's Findings

- Paden City residents who previously ingested or used Paden City municipal water through June 2023 are not expected to experience harmful health effects from the contaminants sampled in the drinking water, including PCE, trihalomethanes, haloacetic acids, and other volatile organic compounds (VOCs).
- PCE was detected above the Environmental Protection Agency's maximum contaminant level (MCL) in the Paden City drinking water in July 2023. Because the water system was not in compliance with the MCL, Paden City issued a notice to residents. This notice, effective August 16, 2023, until September 12, 2023, advised residents to avoid drinking the water or using it to shower to avoid exposures to PCE. ATSDR will evaluate data from this period to determine its public health significance and report those findings in an addendum to this document.
- Paden City's drinking water treatment system is currently treating the drinking water to meet state and federal standards.

**Many factors contribute to whether contaminants with toxic properties will harm a person who is exposed to them. These include concentration of the contaminant, frequency of exposure, and duration of exposure.**

- Where sampling has occurred, residents are unlikely to experience harmful health effects due to indoor air exposures to PCE and other related contaminants from the movement of the chemicals from the groundwater or soil's vapor into a building through its foundation, cracks, or drain system (also known as vapor migration and intrusion) at the concentrations detected.
- Further assessment of how vapors might be entering buildings is needed to better understand where indoor air might be affected by vapor intrusion, the levels of exposure to humans, and the effects over time.

### Recommendations

**ATSDR recommends the following to Paden City School and Public Officials:**

- Continue to operate the air stripper water treatment system and monitor finished drinking water to ensure effectiveness of the treatment system.
- Consider an alternative to PCE-based dry cleaning to maintain team uniforms and reduce exposures to PCE.
- Consider developing emergency contingency plans to provide uncontaminated water to consumers if the treatment system malfunctions.



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## ATSDR recommends the following to environmental agencies:

- Continue to monitor and define the boundaries of the contaminant plume in Paden City.
- Assess additional locations for vapor intrusion based on an understanding of the contaminant plume, geology, and hydrology in the area.
- Conduct vapor intrusion sampling in buildings where exposures might occur and include assessments of seasonal variability for locations already monitored, such as Paden City High School.
- Perform sub-slab soil gas and outdoor air sampling, along with indoor sampling, to assist with identifying background sources of vapor intrusion.
- Consider measuring indicators, tracers, and surrogates to assist with identifying whether vapor intrusion conditions were active or dormant during sampling.
- Develop a long-term plan to monitor vapor intrusion or to proactively install vapor mitigation systems in properties that have high levels of volatile contaminants in underlying soil or groundwater.
- Continue to monitor indoor air in occupied spaces above the contaminant plume.

## Next Steps

### ATSDR will do the following:

- Continue, upon request, to provide technical assistance to the EPA and West Virginia Department of Environmental Protection during the ongoing site investigations.
- Continue, upon request, to review the data collected by environmental agencies to determine how exposures can affect Paden City residents' health.
- Evaluate the drinking water data from the 2023 treatment system malfunction in an addendum to this health consultation document and provide updated conclusions, recommendations, and proposed future actions, as applicable.
- Coordinate and attend future public meetings and present the findings of the health consultation.
- Remain available to discuss community health concerns, upon request.
- Coordinate and collaborate with the state health department to provide the best and most relevant information to Paden City residents.

Learn more: For questions about exposure or health concerns, please contact ATSDR's Region 3 Representative, Emily Adler at (215) 814-2927 or [ggk3@cdc.gov](mailto:ggk3@cdc.gov). You can also call our toll-free number at 800-CDC-INFO (800-232-4636) and ask for information on the Paden City Groundwater site.

## Resources

1. Toxicological Profile for Tetrachloroethylene: <https://www.atsdr.cdc.gov/ToxProfiles/tp18.pdf>
2. ToxFAQs for Tetrachloroethylene: <https://www.atsdr.cdc.gov/toxfaqs/tfacts18.pdf>
3. Investigating Vapor Intrusion: [https://www.atsdr.cdc.gov/docs/atsdr\\_vapor\\_investigation.pdf](https://www.atsdr.cdc.gov/docs/atsdr_vapor_investigation.pdf)

