



**COLUMBIA**  
**TECHNOLOGIES**

THINK. RESTORE, *SUSTAINABLY*

*Partnering for Smarter Sustainable Solutions*

## 1,4-Dioxane – FACT SHEET

### What is it?

1,4-Dioxane is a likely human carcinogen and found in groundwater at sites throughout the United States. The EPA has calculated a screening level of 0.67µg/L for 1,4-dioxane in tap water, based on a 1 in 10<sup>-6</sup> lifetime excess cancer risk. Several states have established criteria for 1,4-Dioxane limits and action, including Florida groundwater at 3.2ug/L, EPA NCEA tap water at 3ug/L, and EPA Regions 3, 6, and 9 at 6.1ug/L in tap water for Risk Based Concentrations, Screening Levels, and Preliminary Remediation Goal, respectively.

### Where does it come from?

Primarily used as a solvent in the 1920's-1950's, 1,4-dioxane was used as a stabilizer for 1,1,1-Trichloroethane (1,1,1-TCA) in the 1960's. 1,4-dioxane was added to TCA solvents at concentrations of 5-8%. It has been used as a stabilizer in chlorinated solvents, waxes, paint strippers, and greases.

Due to its physical and chemical properties, Dioxane is usually one of the most mobile contaminants at solvent release sites, and the footprint of the Dioxane plume may be many times larger than the plume of TCA and its breakdown products. Dioxane plumes have been documented to measure twice the length of the associated solvent plumes and to affect an area up to six times greater. Some closed TCA sites have been re-opened for Dioxane.

### What does it do?

1,4-Dioxane is classified by the EPA as “likely to be carcinogenic to humans” by all routes of exposure.

The American Conference of Governmental Industrial Hygienists has classified 1,4-dioxane as a Group A3 carcinogen—confirmed animal carcinogen with unknown relevance to humans (ACGIH 2011). Short-term exposure may cause eye, nose and throat irritation; long-term exposure may cause kidney and liver damage. The physical and chemical properties and behavior of 1,4-dioxane create challenges for its characterization and treatment. It is highly mobile and has not been shown to readily biodegrade in the environment.

### How can we help? – High Resolution Profiling PLUS Certified Mobile Laboratory

**High resolution technologies** including the Membrane Interface Probe (MIP) and Hydraulic Profiling Tool (HPT) offer proven methods for the rapid mapping and delineation of cVOCs. These systems provide a reliable method for identifying and separating primary chlorinated solvents from the stabilizer 1,4-Dioxane. HPT provides accurate delineation of higher permeability strata likely to be zones of transport for the highly soluble 1,4-Dioxane.

## COLUMBIA Technologies' Solutions are Tailor-Made for:

- Army, Navy, Air Force and other Department of Defense sites;
- Federal agencies involved in large, complex cleanup challenges;
- State agencies that oversee underground storage tank (UST) cleanup programs;
- Environmental consultants/integrators that provide strategic and technical assistance to State and Federal cleanup programs.



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In addition, COLUMBIA Technologies offers NELAC **certified mobile lab** testing for 1,4-dioxane, alone or in conjunction with EPA Method 8260 - Volatile Organic Compounds, with a Method Detection Limit (MDL) of 0.8 ug/L and a reporting limit of 2.0ug/L.

Our mobile lab provides real-time analysis and data along with all relevant QC allowing for real-time decision making during site characterization and remediation. Paired with our **Smart Data Solutions**<sup>®</sup> reports, COLUMBIA Technologies is able to provide detailed high resolution location and depth-specific data allowing for accurate site modeling.

Reference Links and Additional Resources:

[EPA 1,4 Dioxane Fact Sheet](#)

[Clu-in 1,4 Dioxane Fact Sheet](#)

To learn more about 1,4-Dioxane or our full range of high resolution site characterization technologies and services, visit us online at [columbiatechnologies.com](http://columbiatechnologies.com), or call us today at 888-344-2704.

## **COLUMBIA Technologies' Impressive Credentials**

- Performed over 1,500 high-resolution site evaluations throughout the Americas, including Alaska, Hawaii, Canada, Mexico and Brazil, and Australia.
- Over 300 customers including 20 of the top environmental design firms, Fortune 500 companies, and state and federal agencies.
- 100% of technical staff members are degreed, experienced geochemists with a thorough understanding of high-resolution site characterization.

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