



## Environmental Health - Toxic Substances

# Non-Aqueous Phase Liquids (NAPLs)

## Defintions

### *Non-Aqueous Phase Liquids (NAPLs)* –

“Many common contaminants are liquids that, like oil, do not dissolve readily in water. Such liquids are known as NAPLs, of which there are two classes: light NAPLs ([LNAPLs](#)), such as gasoline, are less dense than water; dense NAPLs ([DNAPLs](#)), such as the common solvent trichloroethylene, are more dense than water.” – National Research Council, 1994

**NAPL** – “A liquid solution that does not mix easily with water. Many common ground water contaminants, including chlorinated solvents and many petroleum products, enter the subsurface in nonaqueous-phase solutions.” – National Research Council, 1993

**NAPL** – “Many contaminants, including chlorinated solvents and petroleum products, enter the subsurface in the form of an oily liquid, known as a NAPL. NAPLs do not mix readily with water and therefore flow separately from ground water. If the NAPL is more dense than water (known as DNAPL), it will tend to sink once it reaches the water table. If the liquid is less dense than water (known as an LNAPL), it will tend to float on the water table.” – National Research Council, 1997

## Related Definitions

[Light Non-Aqueous Phase Liquids \(LNAPLs\)](#)

[Dense Non-Aqueous Phase Liquids \(DNAPLs\)](#)

## USGS Information on NAPLs

- Geochemical and Microbiological Processes that Affect Migration and Natural Attenuation of Chlorinated Solvents in Fractured Sedimentary Rock -- [Naval Air Warfare Center \(NAWC\) Research Site, West Trenton, NJ](#)
- [Multiphase Flow, Transport, Reaction and Biodegradation](#)
- [Preliminary Conceptual Models of the Occurrence, Fate, and Transport of Chlorinated Solvents in Karst Regions of Tennessee](#), U.S. Geological Survey Water-Resources Investigations Report 97-4097
- [Defining Reaction Mechanisms in Clay/Organic Mixtures](#)

## Related Science Feature Articles

- [Pipeline Crude Oil Spill Still a Cleanup Challenge after 30 Years](#)
- [Rethinking the Limits of Oxygen-Based Biodegradation - More Oxygen Than We Think](#)
- [DNAPL Removal Key to Accelerated, Less Expensive Remediation](#)
- [What Controls the Migration of Chlorinated Solvents in Fractured Rock?](#)
- [Software Provides Estimates of How Long it Will Take for Remediation Efforts to Achieve Their Goals](#)
- [Using Oxygen to Clean Up Ground-Water Contamination](#)

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- [MTBE Biodegrades Naturally in Stream Sediments](#)
- [Natural Attenuation of MTBE at Laurel Bay, South Carolina](#)
- [How Do You Clean Up Gasoline Spills Naturally?](#)

## More Information on NAPLs

- [Enhanced Remediation of DNAPLs in Low Permeability Zones](#), Environmental Engineering Laboratory
- [Introduction of Web Site on Cleanup of DNAPLs](#), Superfund, U.S. Environmental Protection Agency
- [DNAPLs \(Dense Non-aqueous Phase Liquids\) Fact Sheet](#), Flow Visualization and Processes Laboratory, Sandia National Laboratories
- [Ground Water Issue: Light Non-Aqueous Phase Liquids](#), U.S. Environmental Protection Agency

## References

National Research Council, 1997, [Innovations in ground water and soil cleanup--From concept to commercialization](#): Washington, D.C., National Academies Press, 310 p.

National Research Council, 1994, [Alternatives for ground water cleanup](#): Washington, D.C., National Academies Press, 315 p.

National Research Council, 1993, [In situ bioremediation--When does it work?](#): Washington, D.C., National Academies Press, 224 p.

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Page Last Modified: Tuesday, 04-Aug-2015 14:26:50 EDT

