

Drinking water threats from solvents

Organic solvents and dense non-aqueous phase liquids (DNAPLs)

Many household and industrial products contain hazardous liquids that can harm drinking water and our health.

Great care is needed when using these substances to ensure they do not pollute our municipal drinking water sources.

Understanding the threat

Organic solvents:

Organic solvents are used to dissolve substances such as oils, resins, and plastics. These liquids are used in the production of plastics, textiles, dyes, pharmaceuticals and farm products.

Many of these chemicals are considered to be carcinogens (cancer-causing) and neurotoxins.

The Ontario *Clean Water Act, 2006* identifies four organic solvents that could pose a significant threat to drinking water:

- Carbon tetrachloride
- Chloroform
- Methylene chloride (Dichloromethane)
- Pentachlorophenol

DNAPLs:

Dense non-aqueous phase liquids, or DNAPLs, are very hazardous chemicals. They are heavier than water so they tend to sink in aquifers, making them hard to detect and almost impossible to remove. Even at low levels, they can cause serious health issues, such as cancer.

The most commonly used DNAPLs are enamel paints, degreasers, and metal cleaners. DNAPLs include:

- 1,4-Dioxane
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Tetrachloroethylene (also known as perchloroethylene or PCE)
- Trichloroethylene (TCE)
- Vinyl Chloride (VC)

Ontario's *Clean Water*

Act, 2006 has two main groups of hazardous liquid chemicals that are threats to drinking water.

They are:

- Organic solvents
- Dense non-aqueous phase liquids (DNAPLs)



Will plans affect me?

A local committee developed source protection plans for the Maitland Valley and Ausable Bayfield areas. Ontario approved these plans in January, 2015. Plan policies took effect in April, 2015.

Plan policies do not require action from everyone who has organic solvents and dense non-aqueous phase liquids. Only people using or storing these chemicals where this activity is a significant threat to drinking water are required to comply.

The level of threat – low, moderate, or significant – depends on factors such as how close it is to the municipal drinking water source, the volume, and type of chemical being used or stored.

Because DNAPLs are so toxic, Ontario's Tables of Threats and Circumstances say these dense liquids pose a significant threat to drinking water sources in wellhead protection areas A, B, and C.

Local source protection plans require risk management plans for DNAPLs in quantities greater than 25 litres. Education is to reduce the risk of this activity when quantities are smaller.

Organic solvents are a significant threat in quantities greater than 25 litres and within 100 metres of the municipal well (Wellhead Protection Area A), or the most vulnerable areas of Wellhead Protection Area B (two-year time-of-travel zone).

Contact your risk management official or source protection staff for more information.

How are organic solvents and DNAPLs being addressed locally?

Locally-developed source protection plans use a variety of tools to manage threats such as organic solvents and dense non-aqueous phase liquids.

Education and Outreach

Outreach is taking place with people like you to increase awareness and engage people in positive actions to protect municipal drinking water sources.

Restricted Land Use

This is a 'flag' that helps the municipality to identify properties where the activity requires a risk management plan or is prohibited.

Risk Management Plan (RMP)

- Required for significant threats only.
- Local plans state that a risk management plan is required when quantity is greater than 25 litres.
- Used mostly for existing activities.
- Risk Management Official will work with the operator, landowner, or person doing the activity to develop a plan to make sure that organic solvents and/or DNAPLs are safely managed.

Prohibition

- Any new (i.e., future) storage of organic solvents and DNAPLs will be prohibited only where it poses a significant threat.
- Prohibition is only used in the most vulnerable areas near municipal wells.

Visit sourcewaterinfo.on.ca for maps of wellhead protection areas where organic solvents and DNAPLs are significant threats to drinking water sources.

Visit ontario.ca for Tables of Threats and Circumstances.



Types of activities that threaten drinking water sources

- Septic systems; On-site sewage
- Fuel oil (including home heating oil)
- Liquid fuel such as gas stations
- Chemicals (toxic chemicals such as organic solvents and dense non-aqueous phase liquids or DNAPLs)
- Commercial fertilizer
- Pesticides
- Nutrients (manure, bio-solids, grazing)
- Waste disposal sites (including storage of hazardous waste)
- Sewage works (sewage treatment plants, municipal sewers)
- Road salt and snow storage
- Others: For the list of 21 provincially prescribed drinking water threats, go to this web page: ontario.ca/document/tables-drinking-water-threats

Find out more online:

- **Source protection plans – Maitland Valley and Ausable Bayfield areas:** sourcewaterinfo.on.ca
- **Source Protection Ontario:** ontario.ca/environment-and-energy/source-protection
- **DNAPLs and organic solvents:** archive.org/details/stdprod089475.ome
- **Hazardous waste collection sites (Orange Drop Program):** makethedrop.ca

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