

DRINKING WATER SOURCE PROTECTION

ACT FOR CLEAN WATER



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Drinking Water Threats from DNAPLS

The storage and handling of DNAPLS are considered drinking water threats under Ontario's *Clean Water Act, 2006*. Dense non-aqueous phase liquids or DNAPLS are chemicals that are heavier or denser than water and do not dissolve easily in water. DNAPLS are considered dangerous and toxic to human health even at low levels. Some have been classified as carcinogenic to humans and animals.

When spilled on the ground, these substances sink below the water table, creating contamination of the groundwater that can last for decades or centuries. DNAPLS are difficult to locate and remove from below the ground and complete cleanup is

considered unattainable. DNAPLS are considered a very high risk based on the likely inability to remediate the aquifer and the time needed to replace a well.

DNAPLS are used widely in many industries and are also found in smaller quantities in common household products like adhesives and cleaners. Some common DNAPLS are dry cleaning chemicals, cleaning and degreasing solvents and varnishes. The most common DNAPLS are chlorinated solvents, for example, Trichloroethylene (TCE), which is used to clean metal products, and is also found in paint removers or strippers, spot removers and rug-cleaning fluids.

Which DNAPLS are considered a threat to drinking water sources?

DNAPLS pose a threat at greater distances from wells than some other chemical threats because they are persistent in the environment.

DNAPLS are widely and commonly used and so the potential exists for future contamination through spills and leaks from storage. Ontario has identified the following DNAPLS that could make their way into groundwater as a result of handling or storage. They are:

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

Type of threats to our drinking water sources:

Waste Disposal Sites

On-site Sewage Systems (septic systems)

Sewage Works (sewage treatment plants, municipal sewers)

Fuel Oil (residential heating oil)

Liquid Fuel

Nutrients (manure, bio-solids, outdoor livestock areas)

Commercial Fertilizer

Pesticides

Road Salt and Snow Storage

Chemicals (DNAPLS (toxic chemicals) and Organic Solvents)

Aquaculture

Aircraft De-icing Runoff

Where are the threats from DNAPLs in the Quinte Region?

The storage and handling of DNAPLs is considered a significant threat to drinking water sources in the vulnerable areas surrounding municipal wells. These vulnerable areas are called Wellhead Protection Areas or WHPAs. Policies for DNAPLs in the Source Protection Plan apply in the WHPAs A, B and C, for the municipal wells at Deloro, Madoc, Peats Point, Point Anne and Tweed.

Fewer than 10 parcels of land were identified where there is an existing significant threat from the handling and storage of DNAPLs in the Quinte Region.



Improper or careless handling and storage of chemicals can pose a threat to our drinking water sources.



Where handling and storage of dangerous chemicals is permitted, safe storage methods are required to help manage the risk.

How are threats from DNAPLs being addressed?

Three policies in the Source Protection Plan address both existing and future handling and storage of DNAPLs that are or would be significant drinking water threats in the specific vulnerable areas. Maps showing the vulnerable areas (wellhead protection areas or WHPAs) surrounding municipal water sources in the Quinte Region are available at www.quintesourcewater.ca. Policies in the Source Protection Plan are available at the same website and call for the following:

Education and Outreach: A general education policy calls for a program to raise awareness in the areas surrounding municipal wells (WHPAs A, B and C) regarding the importance of protecting drinking water from contamination from DNAPLs. It will encourage and promote, through voluntary action, the proper storage and handling of DNAPLs. Another general policy calls for municipalities to provide opportunities for residents to dispose of hazardous materials in an appropriate manner such as through Household Hazardous Waste collection programs.

Prohibition: Commercial and industrial storage and handling of DNAPLs, now and in the future, is prohibited in the area immediately surrounding a municipal well (WHPA A).

Risk Management Plans: Risk management plans will be required for existing commercial and industrial handling and storage of DNAPLs in specific vulnerable areas (WHPA B and C) surrounding municipal wells. The risk management plan will consider each property on a case-by-case basis and incorporate any other existing measures that are already in place. The risk management official will work with the property or business owner to develop a plan to ensure the safe handling and storage of DNAPLs. A Risk Management Official will be in touch with anyone requiring a risk management plan.

Restricted Land Use: This allows the municipality to identify areas (WHPAs A, B and C) where the handling and storage of DNAPLs are either prohibited or require a risk management plan. This will assist municipalities to create their own internal process to ensure compliance with the Source Protection Plan.