

## What are DNAPL Chemicals?

Dense Non-aqueous Phase Liquids (DNAPLs) are chemicals that more dense than water and do not dissolve in water. If spilled, they tend to sink into the ground and contaminate deep groundwater aquifers. **DNAPLs that are *significant drinking water threats* and subject to Source Protection Plan policies include Polyaromatic hydrocarbons (PAHs), Dioxane-1,4, Tetrachloroethylene (PCE), Trichloroethylene (TCE), Vinyl Chloride.** Compounds that are not liquid at room temperature would not form a dense non-aqueous phase liquid. Liquid mixtures containing some or all of these compounds and having a density greater than 1.0 kg/L would be a DNAPL.

- **PAHs:** Used in wood preservatives, pharmaceuticals, dyes and asphalt products, creosote manufacturing, woods burning, combustion of biofuels
  - **PAH Compounds:** Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Benzo(a)phenanthrene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene
- **Dioxane-1.4:** Used as a degreasing solvent or solvent stabilizer in various manufacturing processes.
- **Tetrachloroethylene (PCE):** Used in dry cleaning, metal cleaning and as intermediate in manufacturing processes.
- **\*Trichloroethylene (TCE):** Mainly used for degreasing metal parts in the automotive and metal industries. Also found in some household products such as adhesives, paint removers, paints, rug cleaning fluids, and metal cleaners.
- **\*Vinyl Chloride:** Used to make polyvinyl chloride (PVC) pipes, wire coatings, vehicle upholstery and plastic kitchen ware.
  - **\*Compounds that degrade into TCE or Vinyl Chloride:**
    - 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane,
    - 1,1,1-Trichloroethane (1,1,1-TCA), 1,1,2-Trichloroethane (1,1,2-TCA),
    - 1,1-Dichloroethylene (1,1-DCE), 1,1-Dichloroethylene (1,1-DCE),
    - Cis 1,2-Dichloroethylene (Cis 1,2-DCE), Trans 1,2-Dichloroethylene (Trans 1,2-DCE), Chloroacetylene, Dichloroacetylene

## Significant Threat Criteria and Policy Implication – DNAPL Chemicals

### Are DNAPLs stored or handled within the WHPA A, B or C?

If a spill of the DNAPL may result in the presence of **Dioxane-1,4, Polycyclic Aromatic Hydrocarbons (PAHs), Tetrachloroethylene (PCE), Trichloroethylene, or Vinyl Chloride** in groundwater or surface water, then the following policies apply:

### Policy Approach –DNAPLs Storage and Handling (zoned other than residential)

Significant Area	Existing	Future
WHPA- A, B – 10	Risk Management Plan	Prohibited
WHPA- B, C – 8, 6, 4, 2	Risk Management Plan	Risk Management Plan

## DNAPL Chemicals by CAS Numbers

Chemical Name	CAS Number	Example Products
1,1,1,2-tetrachloroethane	630-20-6	
1,1,1-trichloroethane	71-55-6	Automotive Belt Dressing
1,1,1,2-tetrachloroethane	79-34-5	
1,1,2-trichloroethane	79-00-5	
1,1-dichloroethylene	75-35-4	
1,2-dichloroethane	107-06-2	
1,4-dioxane	123-91-1	
Chloroacetylene	593-63-5	
Cis 1,2-dichloroethylene	156-59-2	
Dichloroacetylene	7572-29-4	
Tetrachloroethylene (PCE)	127-18-4	Liquid wrench (penetrating oil), break cleaner, tire sealant, motor cleaner, lubricant, shoe goo, super grease, lubricant, battery terminal protectors, brake cleaner
Trans 1,2-dichloroethylene	156-60-5	
Trichloroethylene (TCE)	79-01-6	Storm Guard (waterproofing spray), kwik prime (metal primer), bike kit cement, rubber cement, vulcanizing solution, brake parts cleaner
Vinyl chloride	75-01-4	
Polyaromatic hydrocarbons	83-32-9 or 120-12-7	
Acenaphthene	83-32-9	
Acridine	260-94-6	
Anthracene	120-12-7	
Benz(a)anthracene	56-55-3	
Benzo(a)perylene	191-85-5	
Chrysene	218-01-9	
Fluoranthene	206-44-0	
Fluorene	86-73-7	
Naphthalene (aka Stoddard solvent, white spirit or mineral spirit paint thinner, varsol, turpentine)	91-20-3	Varnish, emission test formula, weather strip, diesel lubricant and antigel, lead substitutes, fuel stabilizer, engine brite, octane booster, paints, glosses, varnish, gutter sealant, lamp oil, fuel injection, carb cleaner, fuel system cleaner, cleaner coating, sealants, cleaners, kerosene, fuel system cleaner, gumout, carb medic, window sealant, wood preservative, engine treatments, fuel injector cleaner, waterproofing neverwet, wood stain
Phenanthrene	85-01-8	
Pyrene	129-00-0	