COMMON DRY CLEANER SPILL SCENARIOS

Due to poor housekeeping and business practices, dry cleaners have historically had a high frequency of spills and discharges. Studies by EPA, the State Coalition for Remediation of Dry Cleaners (SCRD) and others have estimated that 75% of the approximately 30,000 dry cleaners currently in operation have contamination (i.e., 22, 500 actively contaminated sites). A 2002 Florida study found that dry cleaner contamination had migrated off-site at 57% of the contaminated sites.

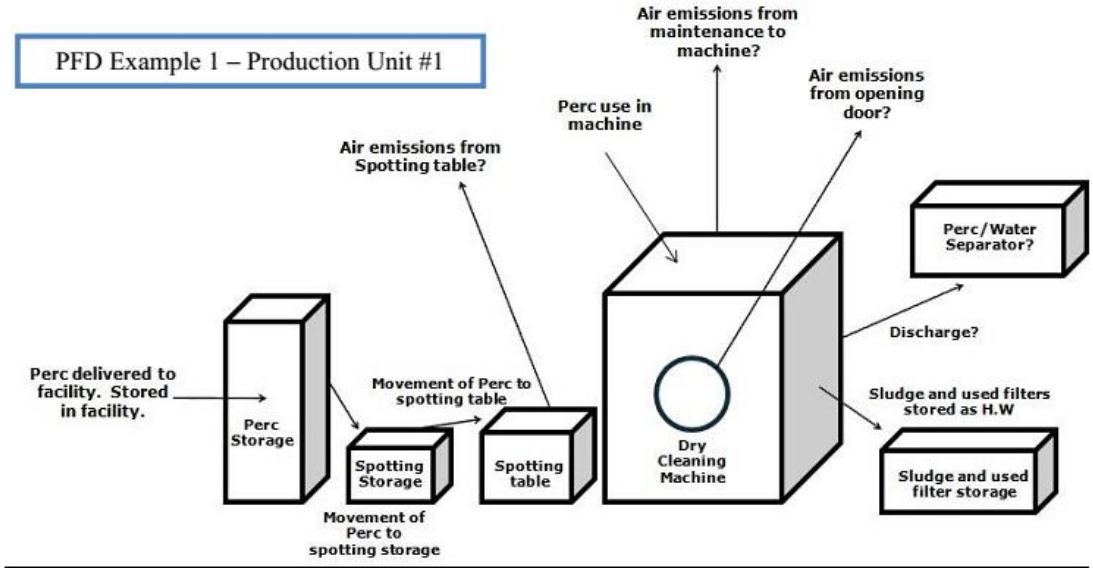
It does not take a lot of solvent to contaminate soil or groundwater. A solvent leak dripping at a rate of one drop per second will result in one gallon of solvent discharged during an 8- hour work day and 320 gallons per year. One tablespoon of PCE is enough to contaminate two Olympic-sized swimming pools. Just one gallon of PCE can cause a 200,000,000 gallon drinking water reservoir to exceed the drinking water standard of 5 parts per billion (ppb).

A 1999 Livermore study the median dry cleaner plume length was approximately 1600 ft while SCRD found the average plume to be 1270 feet. EPA reported that the 90th percentile plume length was 2585 feet and that 89% of dry cleaner plumes exceeded 100 feet

EPA Removal Action at Shopping Center

Following are the more common types of spills associated with dry cleaners:

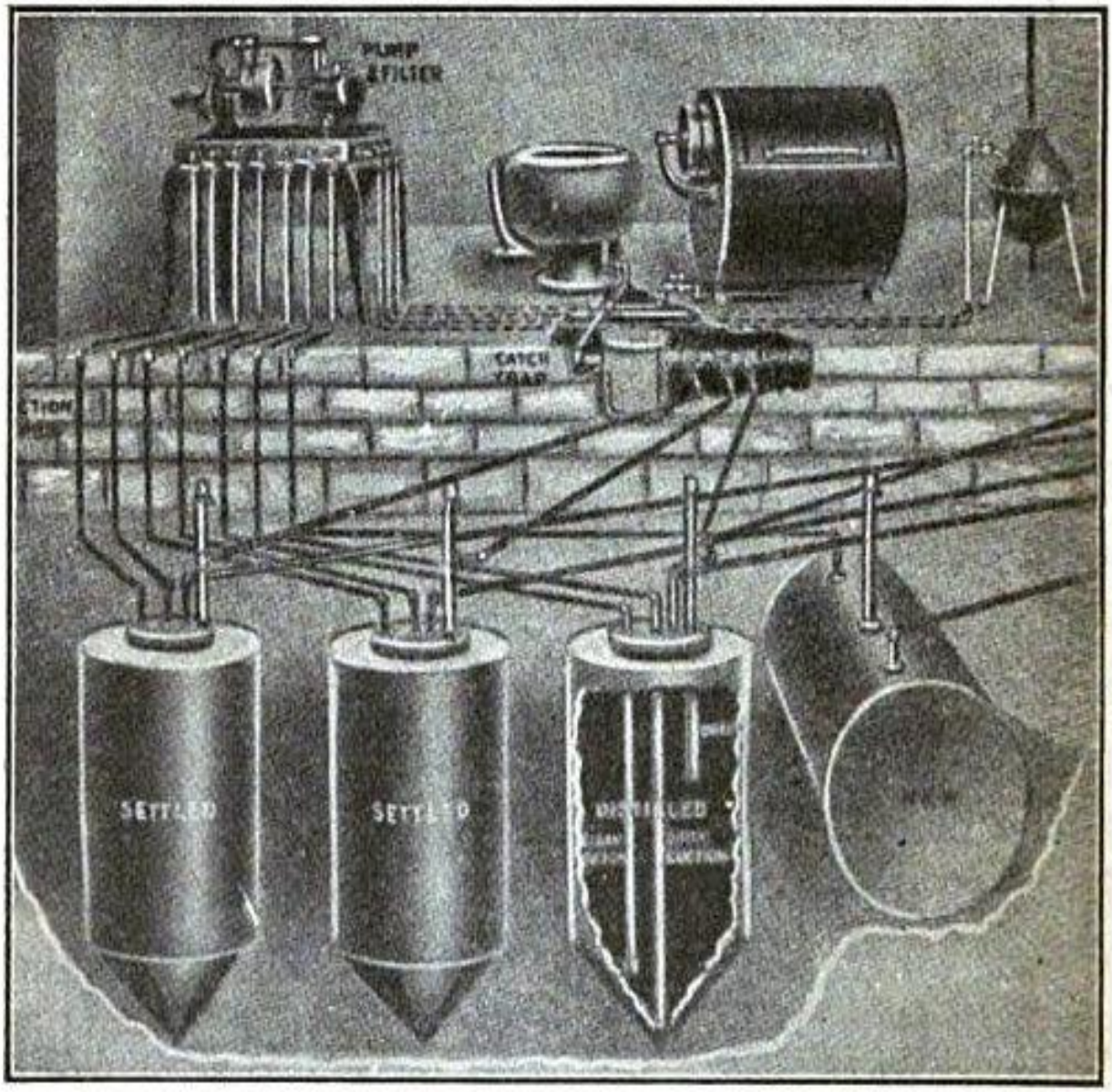
- Spills during solvent transfer or storage;
- Spills resulting from dry cleaning operation/equipment failure/poor maintenance;
- Discharges of dry cleaning wastes into septic systems and sewers;
- Improper waste disposal (disposing used filters in dumpsters, backyard storage, etc)



Solvent delivery/storage/transfers- Historically, most solvent spills have occurred during delivery or transfer of solvent product. In the past, solvent was delivered to the drycleaning facility by a tanker truck. The solvent would be pumped from the truck into a storage tank or directly to the dry cleaning machine. Currently, solvent is usually delivered by drums that are either placed below the dry cleaning equipment or placed within proximity of the equipment. PCE is either directly piped from the drum to the dry cleaning equipment or manually transferred using buckets or containers from the drum to the dry cleaner equipment.

The six leading scenarios for product delivery/transfer spills at dry cleaners are:

- Transfers from tanker trucks;
- Delivery hose uncoupled from tanker truck and reeling hoses back to the truck;
- Overfilling of solvent storage tanks;
- Transfer of solvent from an AST though leaking values or spills from buckets;
- Overfilling AST or dry cleaning machine

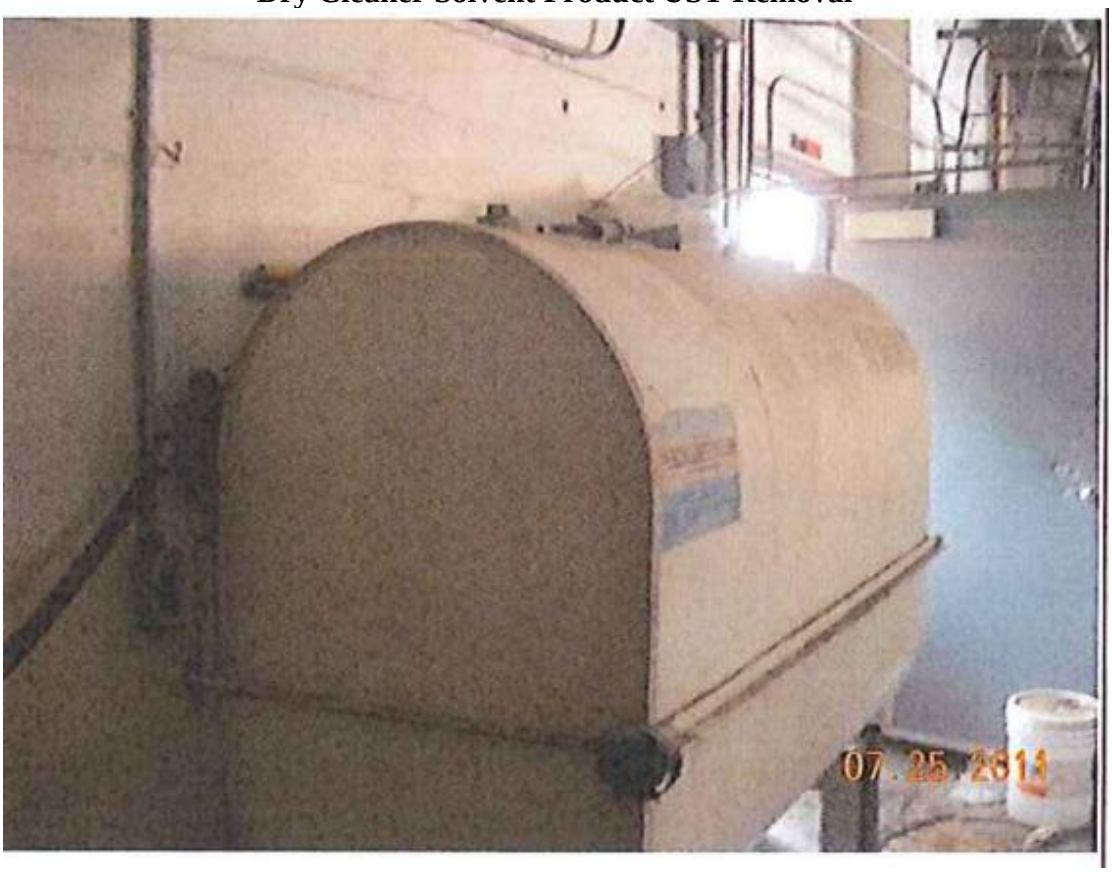


Schematic Drawing Depicting Tanks Used in Dry Cleaner Operation

Vertical and horizontal Product tanks at former dry cleaner site

Solvent Product UST at Rear of Dry Cleaner

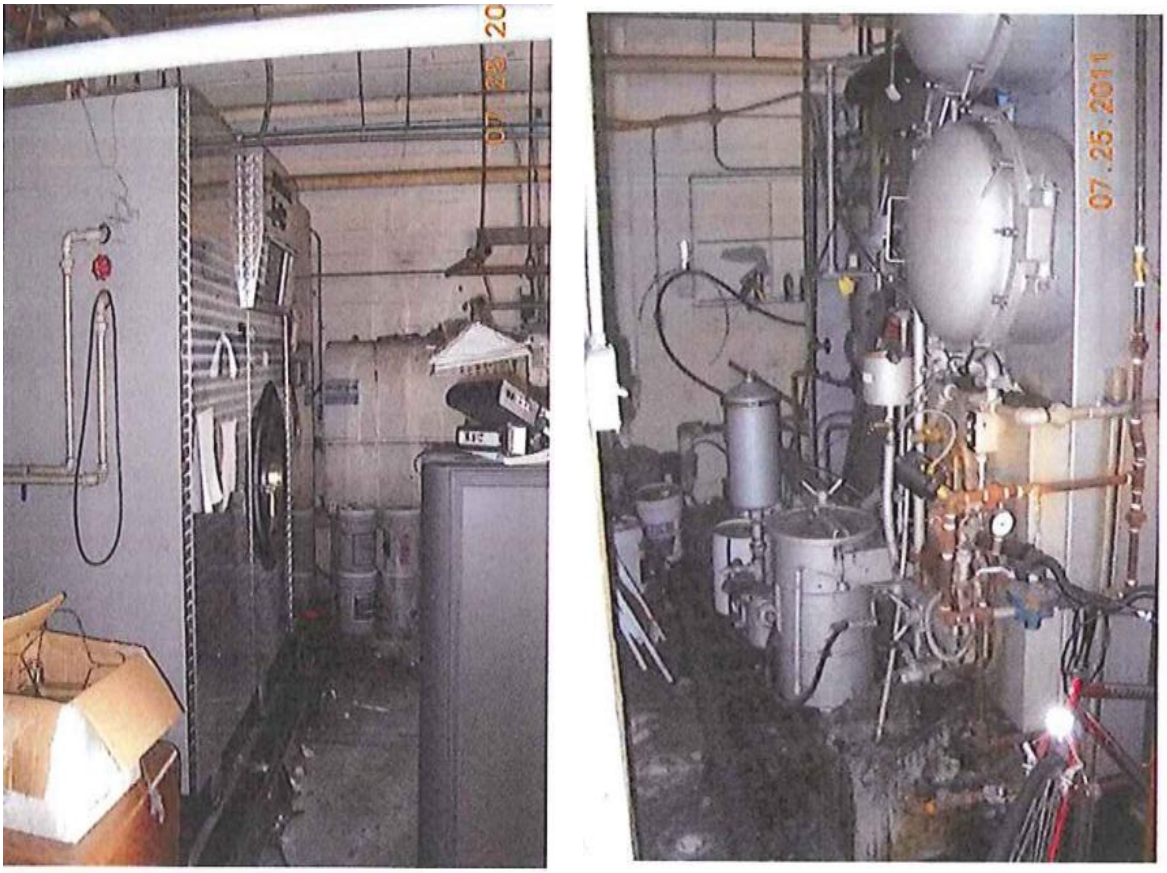
Dry Cleaner Solvent Product UST Removal



PCE Bulk Storage AST

Spills resulting from dry cleaning operation/equipment failure/poor maintenance- A 200s Florida study found that the largest source of reported spills/discharges was associated with dry cleaning equipment failure (39.2% of reported discharges). Equipment leaks can be the result of equipment wear and corrosion; expansion and contraction of metal from temperature changes; and vibration of equipment. The most common source of equipment spills was leaking door gaskets followed by leaks associated with piping and hoses, coupling failures (failed hose clamps, and piping joint failures). Other common sources of equipment leaks were associated with distillation units, gasket failures for button traps and cartridge filter housing.

Spills from operator failure were often due to boilovers of solvent/distillation residues from distillation units-usually from overfilling the distillation units or excessive operating Temperatures.

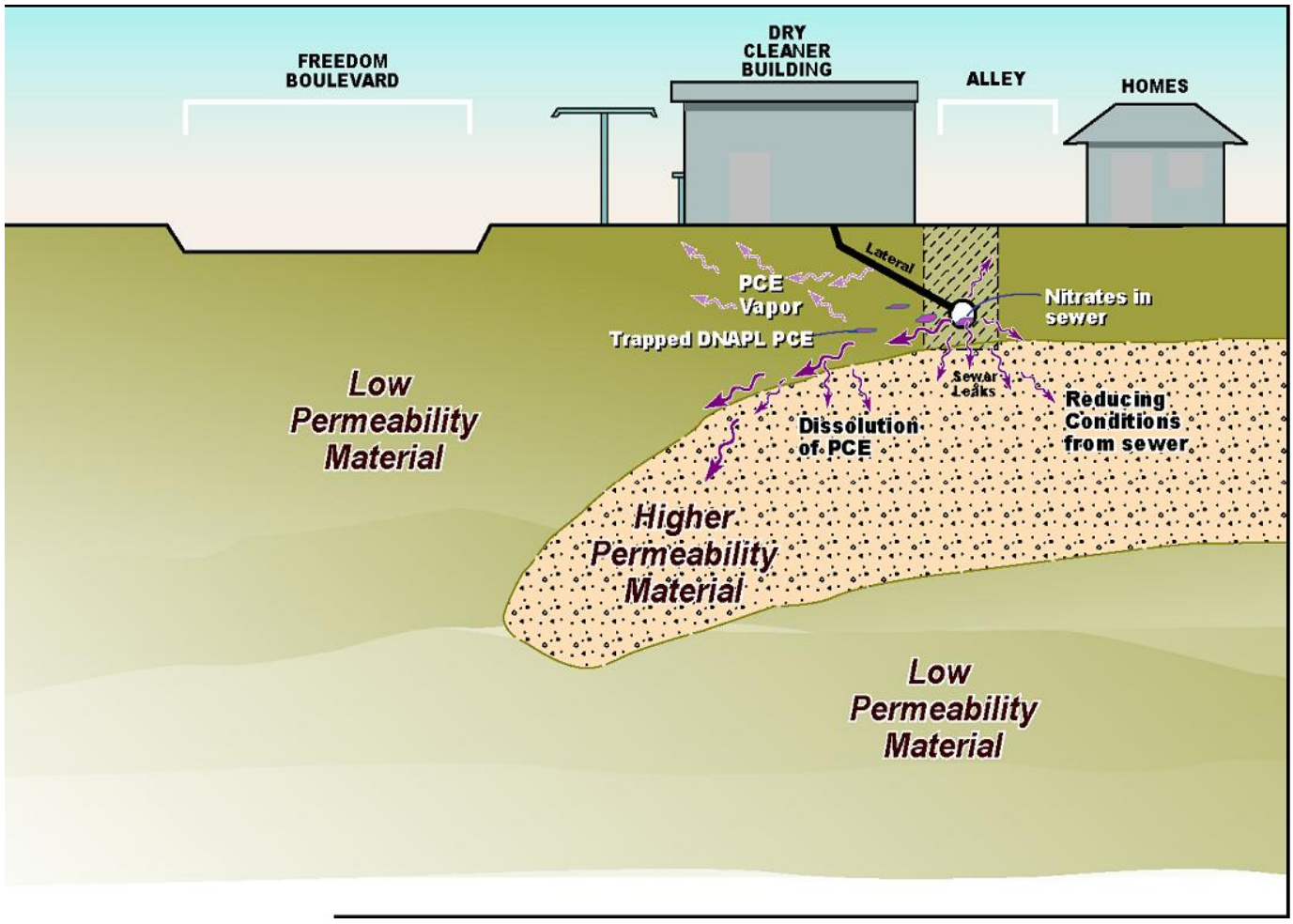


Spills in front (left photo) and rear (right) of dry cleaning equipment

Discharges to Septic Systems or Sewers- Discharges of solvent-laden separator water to sewers and septic systems pose the greatest cleanup and toxic tort liability. These discharges can result in significant soil and groundwater contamination problems and may allow solvent to travel considerable distances from the dry cleaner, often into residential communities where vapor intrusion becomes a concern. Indeed, a 1988 survey

by the International Fabricare Institute (IFI) found that 71% of the dry cleaners discharged separator water either down the sanitary sewer or septic tank.

A 1992 well investigation program conducted by the Central Valley Regional Water Quality Control Board identified 21 PCE impacted drinking water wells in Central Valley towns, and found that dry cleaners were the likely source of PCE for 20 of those wells. A report issued by the Radian Corporation in August 31, 1993 concluded that the contamination in California was probably caused by historical practices of dry-cleaners. A 2007 study by the Santa Clara Water District concluded that past dry cleaners that operated long as 50 years ago pose a greater threat to groundwater than current dry cleaners.



Discharge points: To bare ground (left photo) and to floor drain to sewer (right photo)

Trench Leading to Floor Drain

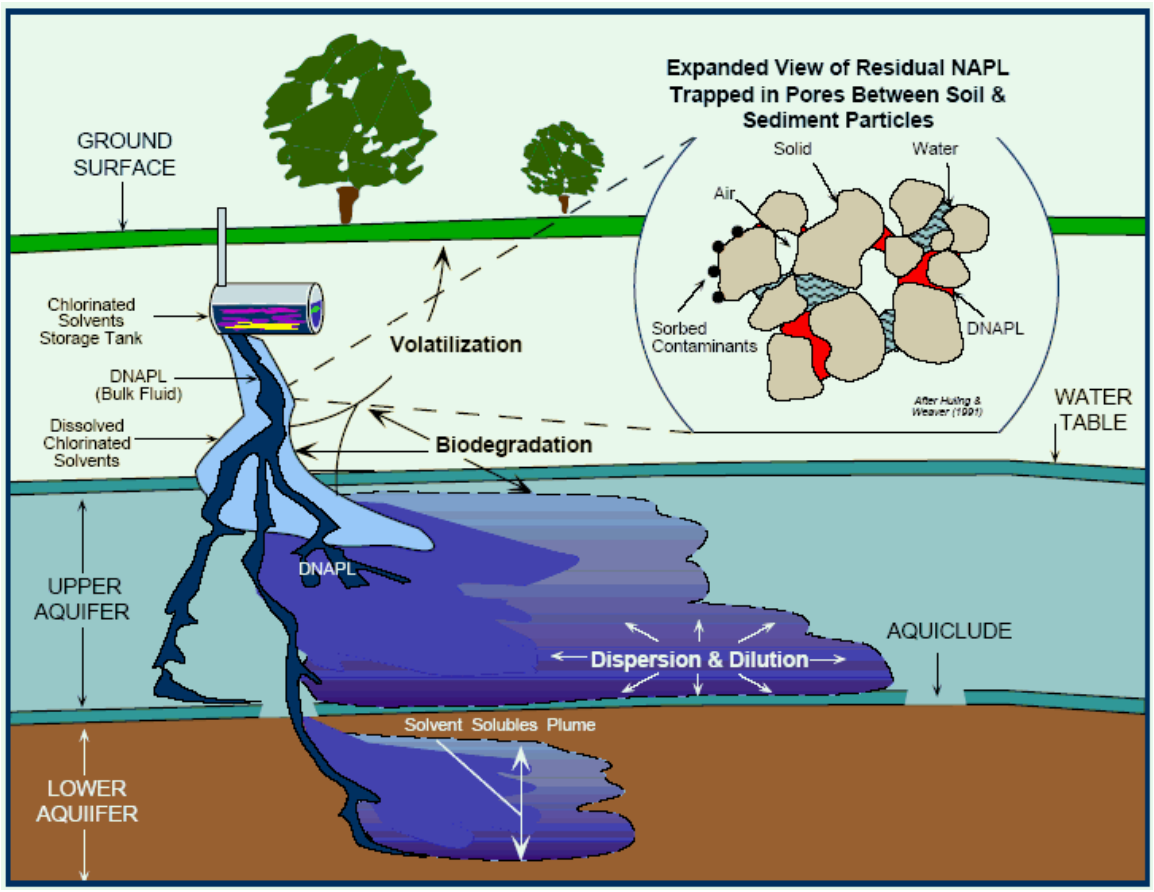
Hose Discharging to Sump

Sump after equipment removed

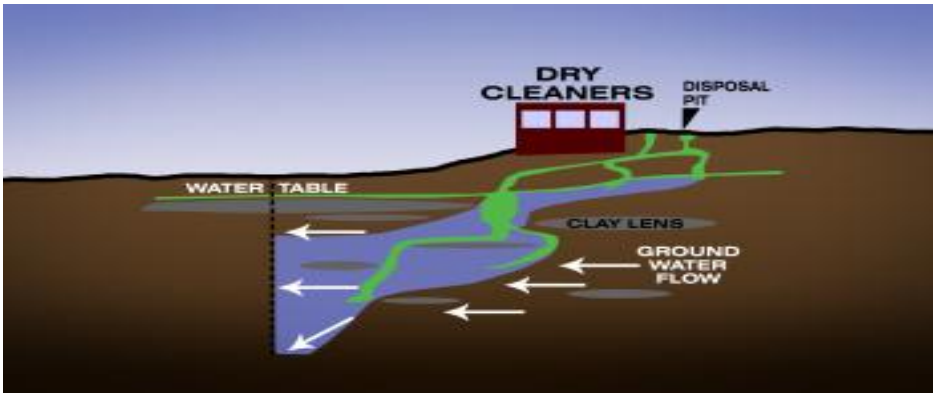
Discharge To Ground

Discharge to Septic System At Former Dry Cleaner

Remnant of Septic Tank At Former Dry Cleaner



Other Discharge Scenarios- It was common in the past for dry cleaners to store spent cartridge filters outside the back service door where solvent drained from the filters onto bare ground or pavement, or disposed dispose solvent wastes into dumpsters where the solvent escaped into the environment as runoff into dry wells, stormwater drains or bare soil.



In the past, regulators were not concerned about plumes when groundwater was not used for drinking water purposes. Often times, the regulators did not even delineate the extent of the plume. However, many regulators are now concerned about the potential for vapor intrusion when solvent plumes extend from the former dry cleaner location to beneath residential communities. Because of vapor intrusion, owners of property that formerly contained a dry cleaner have found themselves being increasingly pulled into toxic tort litigation

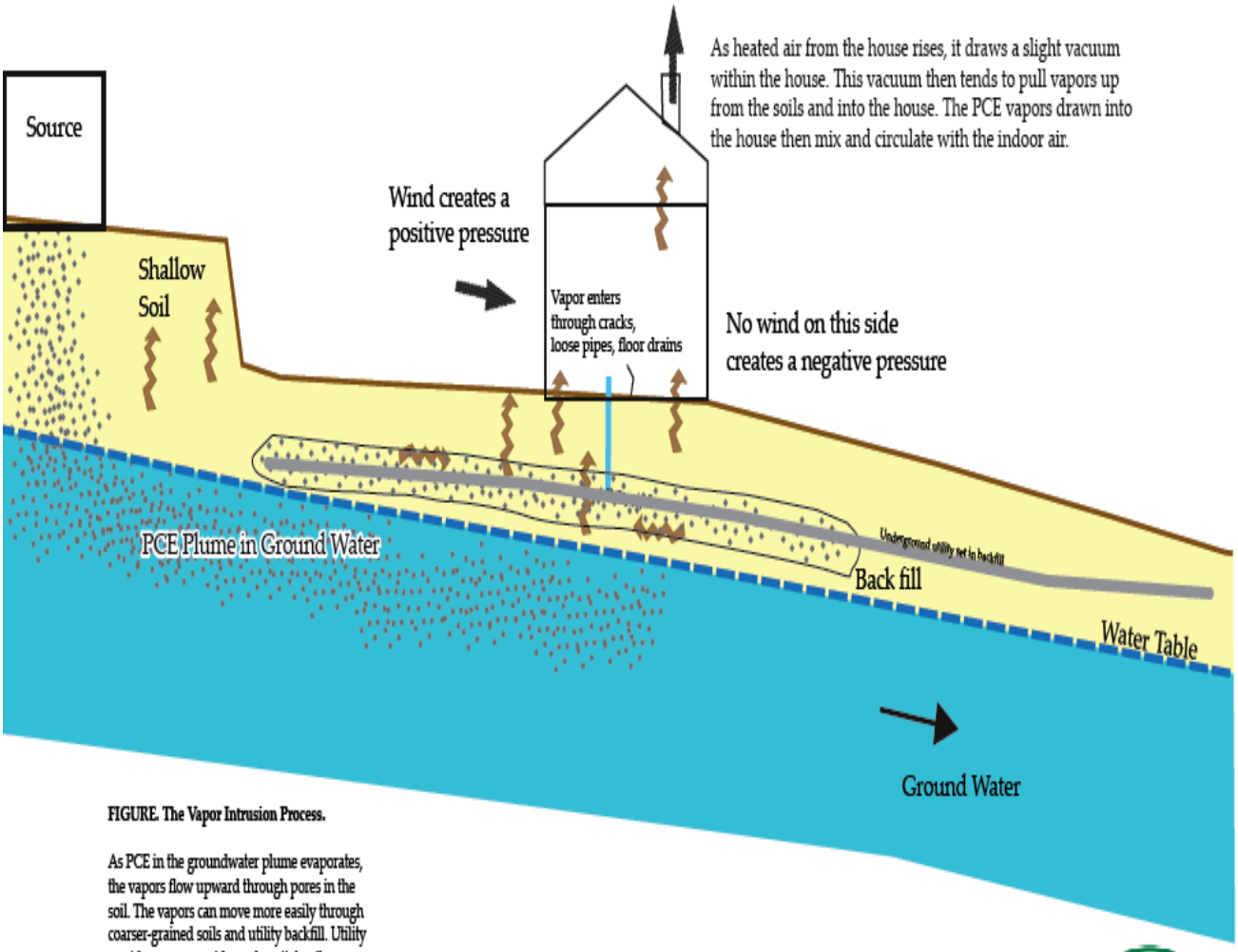


FIGURE. The Vapor Intrusion Process.

As PCE in the groundwater plume evaporates, the vapors flow upward through pores in the soil. The vapors can move more easily through coarser-grained soils and utility backfill. Utility corridors may provide preferential pathways for vapor migration. The vapors can enter into buildings through cracks in the concrete slab or foundation. Vapors may also move along utility lines, such as sewer and water pipes, and enter into the building through gaps in the lines. This process is called "vapor intrusion".

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