2. GROUND WATER CONTAMINATION

Ground water naturally contains many dissolved elements, most of which do not pose a danger to plants or animals. However, harmful substances that we discharge, spill, or bury may soak into the ground and result in ground water contamination. Although there are many clean-up technologies available, it is often very difficult to remove contaminants after they have entered the aquifer. Prevention is the most important strategy. Researchers at Columbia University, the University of Arizona and many other institutions study contaminant transport processes and help develop management strategies.

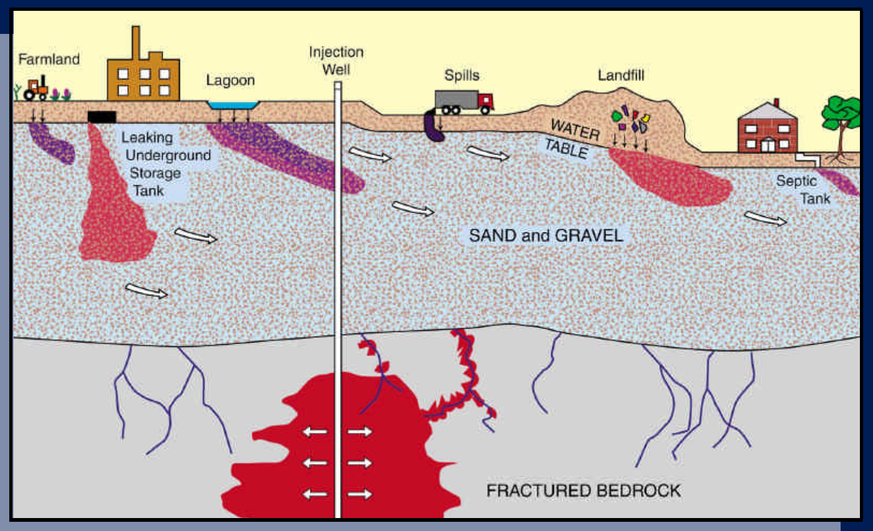

Figure 1. Typical Sources of Ground Water Contaminants. *Ground water is vulnerable to contamination from leaking landfills and fuel tanks, discharge from industrial plants, septic tanks, and from agricultural activities, just to name a few. Some of these contaminants dissolve in water — others do not dissolve well and float on top of the aquifer or sink to the bottom. The migration of contaminants is influenced by their chemical properties, the geology of the aquifer and also by how much water is pumped out of the aquifer.*

Source: after Hemond & Fechner-Levy, 2000

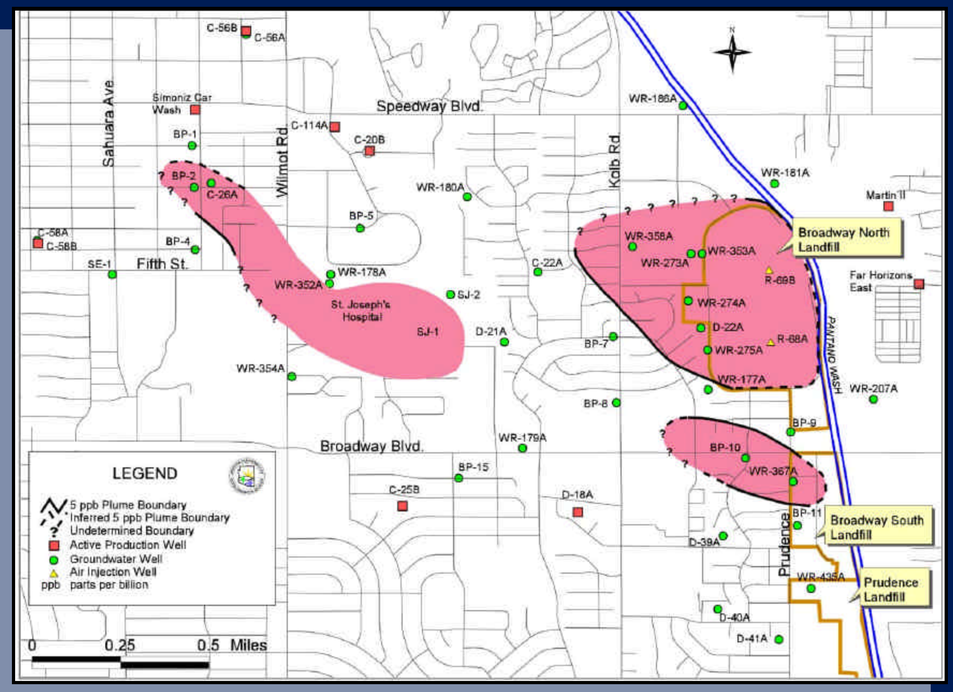

Figure 2. Contaminant Plumes at the Broadway/Pantano Landfill Site. *This municipal landfill is located in east-central Tucson and was operated until 1971. In 1987, tetrachloroethene (PCE) was detected in a city well located at the western edge of the landfill. Since then, trichloroethene (TCE), and vinyl chloride have been found in ground water at levels exceeding regulatory standards. The City of Tucson Water Department (Tucson Water) has lost the use of four municipal wells in its Central Wellfield as a result of the contamination. The contaminants have reached the water table by vapor transport through the unsaturated soil. A soil vapor and ground water containment system will be operational at the landfill in 2002. The map shows the extent of the PCE contamination plumes where the concentrations exceed the regulatory standards (5 micrograms/liter (µg/l)).*

Source: Arizona Department of Environmental Quality, 2002

For more information visit: http://www.bio2.columbia.edu/water/

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