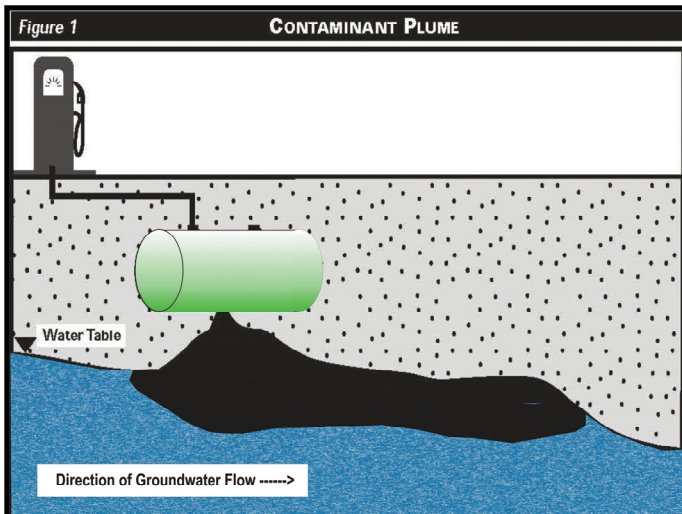


## GROUNDWATER CONTAMINATION PREVENTION AND CLEANUP IN THE CENTRAL AND WEST COAST BASINS

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### What is Groundwater Contamination?

Groundwater contamination happens when naturally-occurring or man-made substances seep into groundwater. This Technical Bulletin addresses man-made groundwater contamination, which may develop through accidental or deliberate releases of chemical products into the subsurface. For example, leaky underground storage tanks and pipelines have often discharged chemicals into groundwater (Figure 1). Improper disposal at commercial (and sometimes residential) facilities has also resulted in chemicals being



Source: USEPA, 1993

dumped on or into the ground. And in some cases, transportation accidents may release chemicals at ground surface and thence into the ground.

Table 1 describes common sources of groundwater contamination as identified by the U.S. Environmental Protection Agency (USEPA). Unfortunately, WRD's service area of southern Los Angeles County is highly urbanized, so almost every potential source shown on this table is found within the District: e.g., landfills, gas stations, oil refineries, and chemical processing facilities. Common groundwater contaminants issuing from these sources include petroleum-based fuels and fuel additives, metals, and solvents such as trichloroethylene (TCE).

Groundwater contaminant chemicals may cause short- and/or long-term adverse health effects through human consumption of the water. Our Fall 2008 Technical Bulletin discussed in detail the drinking water quality standards that protect human health.

**Table 1: Typical Sources of Groundwater Contamination**  
(Source -- USEPA)

<b>Industrial:</b>	
Asphalt plants	Petroleum production/storage
Chemical manufacture/storage	Pipelines
Electronics manufacture	Seepage lagoons
Electroplaters	Storage tanks
Foundries/metal fabricators	Toxic and hazardous spills
Machine/metalworking shops	Wells (improperly abandoned)
Mining and mine drainage	Wood preserving facilities
<b>Commercial:</b>	
Airports	Jewelry/metal plating
Auto repair shops	Laundromats
Boat yards	Medical institutions
Construction areas	Paint shops
Car washes	Photography establishments
Cemeteries	Railroad tracks/yards
Dry cleaners	Research laboratories
Gas stations	Scrap and junkyards
Golf courses	Storage tanks
<b>Agriculture:</b>	
Animal burial areas	Irrigation sites
Animal feedlots	Manure spreading areas/pits
Fertilizer storage/use	Pesticide storage/use
<b>Residential:</b>	
Fuel oil	Septic systems, cesspools
Furniture stripping/refinishing	Sewer lines
Household hazardous products	Swimming pools
Household lawns	(chemical storage)
<b>Other:</b>	
Hazardous waste landfills	Recycling/reduction facilities
Municipal incinerators	Road deicing operations
Municipal landfills	Road maintenance depots
Municipal sewer lines	Stormwater drains/basins
Open burning sites	Waste transfer stations

### Why Should Groundwater Contamination Be Prevented or Cleaned Up?

Groundwater contamination is detrimental to water supplies not only because of its potential health effects, but because the contamination itself ("plume") tends to migrate and spread throughout the aquifer, thereby impacting a larger volume of groundwater over time.

Ideally, groundwater contamination should be prevented in the first place, by eliminating contamination sources

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(e.g., maintaining the integrity of pipelines and storage tanks) and removing conduits to groundwater (e.g., properly destroying unused water wells in accordance with state well destruction standards).

However, there are many cases where the release of chemicals has already taken place. In these situations, timely investigation of the extent of groundwater contamination and prompt cleanup is the best alternative.

## What Are Agencies Doing To Prevent and Clean Up Groundwater Contamination?

Through their various duties, federal, state, and local agencies serve as a network to prevent and clean up groundwater contamination in California. For example, county or city agencies (e.g., environmental health departments, fire departments) annually inspect underground storage tanks for leaks. County or city agencies also issue permits and conduct field inspections for well installations and well destruction.

Depending on the nature and severity of the spill, federal, state and/or local agencies (e.g., USEPA's National Response Center, California Governor's Office of Emergency Services, California Department of Toxic Substances Control [DTSC], California Regional Water Quality Control Board [RWQCB], local fire departments) may respond to an accidental release of chemicals to the environment and implement cleanup.

If contaminants have been released to groundwater, these same federal and/or state regulatory agencies typically manage and enforce site investigations and cleanups. Groundwater contamination site investigations usually include drilling and installing monitoring wells, from which water level data and water samples may be obtained. Groundwater cleanup (a.k.a., "remediation") strategies often involve pump-and-treat systems, where contaminated groundwater is extracted and treated via activated carbon vessels, resin beds or other mechanisms to remove the contamination.

In some cases, other agencies or even private parties may take action to investigate and clean up groundwater contamination. Accordingly, WRD has broad powers conferred by State law (California Water Code, Section 60224) to protect the groundwater of the Central and West Coast Basins from contamination. WRD exercises

these powers to protect groundwater in the basins and ensure a safe and reliable supply. As part of this work, the District undertakes numerous programs, including the following:

- **Safe Drinking Water Program:** Through the installation of wellhead treatment facilities at existing production wells, the District helps water providers remove contaminants from the groundwater supply and deliver the clean, treated water to the public.
- **Title 22 Groundwater Monitoring Program:** WRD provides services to its participating pumpers by sampling drinking water wells and preparing annual water quality reports as required by state law, to ensure that the water continues to be safe for the public.
- **Groundwater Contamination Prevention Program:** The District works with federal and state regulatory agencies to track the investigation and cleanup of various contaminated groundwater sites in WRD's service area, and provides technical and financial assistance to expedite site cleanups.
- **Regional Groundwater Monitoring Program:** WRD regularly collects water level and water quality data from its network of 250 groundwater monitoring wells and other wells to assess current groundwater quality conditions. A report of findings is prepared each year.

## What Can People Do To Help Prevent Groundwater Contamination?

Simple measures can do much to minimize the possibility of household contaminants entering the groundwater supply. Some examples include the following:

- Recycle used oil by disposing of it at a service station or recycling center;
- Reduce or eliminate pesticide application by planting California friendly and/or native plants.

For more information on what you can do to help, visit the "It All Flows To Me" page on our website at [www.wrd.org](http://www.wrd.org).

Click on "Education"

Click on "It All Flows To Me".



### Reference Information used for this Technical Bulletin:

1. U.S. Environmental Protection Agency, 1993, "Wellhead Protection: A Guide for Small Communities".
2. California Governor's Office of Emergency Services, 2006, "California Hazardous Material Spill/Release Notification Guidance".



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