

Maryland Square PCE Site

October, 2011

<http://www.ndep.nv.gov/pce>

The Nevada Division of Environmental Protection (NDEP) prepared this fact sheet to help keep residents informed of progress in the investigation and cleanup of the Maryland Square PCE Site. The Maryland Square PCE Site is located on the west side of S. Maryland Pkwy, just north of Twain Ave (see back page of this fact sheet for a map of the area). The **complete administrative record** for the Maryland Square PCE Site (including all reports referenced in this update) is available on-line at: <http://ndep.nv.gov/pce/foia.htm>.

Current Status of the Investigation and Remediation

Source Area Soil. In September, 2011, contaminated soil at the former dry cleaners was excavated and hauled to a permitted waste disposal facility. Excavated soils were sampled and analyzed prior to disposal. Additionally, a chemical oxidant was added to the bottom of the excavation to treat shallow groundwater. The effectiveness of the soil cleanup was documented through the collection of soil confirmation samples from the base and sides of the excavation. The effectiveness of the oxidant will be evaluated by collecting groundwater samples from monitoring wells located downgradient of the property. The report detailing cleanup of the source area soil is due to the NDEP in November, 2011.



Start of cleanup at the former dry cleaners.

Groundwater. Also in September, 2011, the NDEP concurred with the Corrective Action Plan (CAP) for cleanup of groundwater. The cleanup process will begin with field investigations and pilot tests. Data from these tests will be used to evaluate several cleanup alternatives and select the most appropriate technology. As part of the selection process, the NDEP will provide a **Proposed Plan** describing the technology selected for cleanup of the groundwater and will solicit public input on the proposed cleanup. The **Proposed Plan** will likely be drafted in the second quarter of 2013 and will be available for public review and comment.

Permanent Injunction Issued by U.S. District Court

A **Court Order** ("Permanent Injunction Governing the Cleanup of Hazardous Substances at and Emanating from Maryland Square Shopping Center") was signed **December 27, 2010** in U.S. District Court. Among other obligations, this Order requires the cleanup of PCE-contaminated soil and groundwater and annual testing of indoor air in potentially affected homes. The NDEP is providing regulatory oversight for the planning, implementation, and reporting of this work.

Nature of the PCE Contamination and Potential Exposure to Residents

The contaminant of concern is perchloroethylene (also known as tetrachloroethylene, perc, tetrachloroethene, perchloroethene, or, most commonly, PCE). It is a colorless, nonflammable liquid that does not occur naturally. PCE is a solvent/degreaser used by dry cleaners to clean fabrics, and is also found in some common household products. Because PCE is still used for dry cleaning and in some consumer products, many homes have some "background" level of PCE in indoor air.

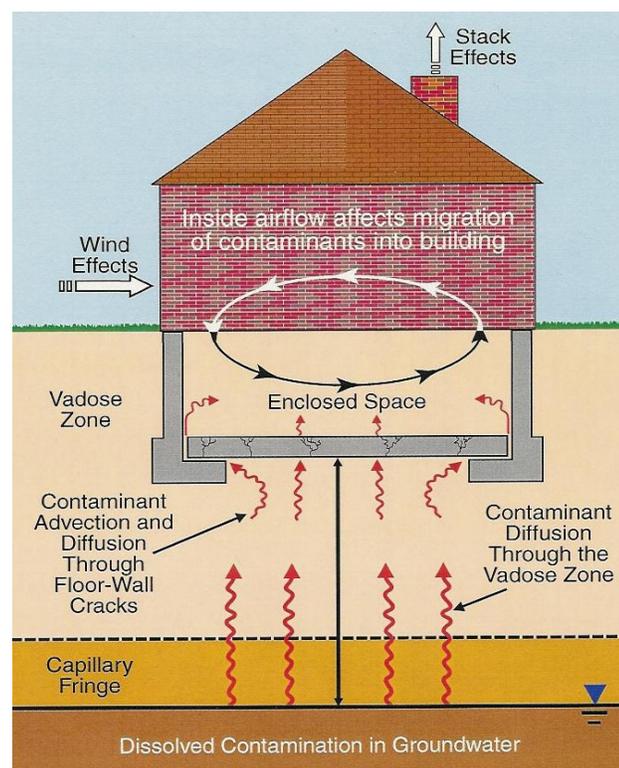
In this case, PCE from the former drycleaner appears to have leaked into soils at the location of the former cleaners. The PCE migrated downward through the soil until it reached groundwater. Upon reaching the water table, the PCE dissolved into the groundwater and migrated eastward with the flow of groundwater. It is the "plume" of dissolved-phase PCE in groundwater that underlies a portion of the Paradise Palms neighborhood (see figure on page 4 of this fact sheet). Soils under the Boulevard Mall and the Paradise Palms neighborhood are **not** contaminated with PCE, but **soil gas** contains PCE vapors that have evaporated from the groundwater. The contaminated soil gas may enter your home through a process known as "vapor intrusion" (see discussion below)

Potential exposures to PCE may occur when occupants breathe contaminated indoor air. Vapor intrusion has only recently (over the past decade) been recognized as an environmental issue. Draft guidance on vapor intrusion was issued by the U.S. Environmental Protection Agency (USEPA) in **2002**, and comprehensive guidance was issued by the Interstate Technology & Regulatory Council (ITRC) in **2007**. Additionally, some states have issued their own guidance. More information on vapor intrusion is available on-line at the NDEP's webpage for PCE at: <http://www.ndep.nv.gov/pce/>.

How Do Solvent Vapors Enter a Building? The Vapor Intrusion Process

PCE-contaminated groundwater may migrate away from the source area, moving in the direction of groundwater flow. As the PCE that is dissolved in the groundwater evaporates, it creates vapors that fill pore spaces in subsurface soil. Soil vapor, or soil gas, is the air found in the pore spaces between the soil particles. Contaminant vapors in the soil gas above the contaminated groundwater can migrate upward and into buildings that overlie the plume.

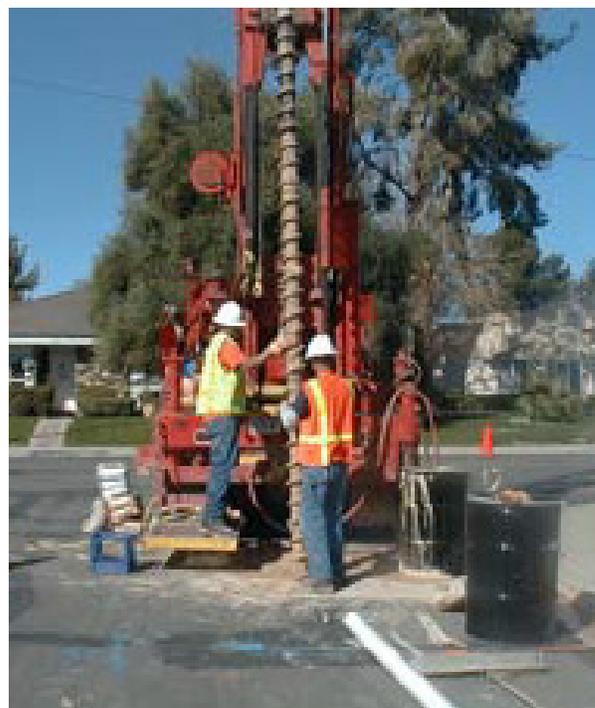
The vapors move from areas of high concentration to areas of low concentration (diffusion) and from areas of high pressure to areas of low pressure (advection). Air pressure inside your home is typically lower than the air pressure in the soil around your home's foundation. This pressure difference causes your house to act like a vacuum, drawing vapors into the house through foundation cracks and other openings. This transport process is called "vapor intrusion."



Additional Wells and the Indoor Air Monitoring Program

Additional monitoring wells are scheduled for installation in late 2011. These wells are being installed to further delineate (define) the downgradient extent of the PCE plume. Groundwater samples will be collected from these wells, as well as from the wells in the current groundwater monitoring network. As of September 2011, 33 monitoring wells had been installed across the site. Data from these wells are available in the quarterly reports at: http://ndep.nv.gov/pce/maryland_reports.htm.

Indoor Air Sampling: Groundwater data will also be evaluated to determine which homes will be offered indoor air sampling. The indoor air sampling is voluntary and the homeowner will be asked to sign an access agreement and follow instructions to ensure that the sample collected is representative of indoor air quality. This coming winter, the **indoor air sampling** will resume as an annual program for monitoring indoor air.



Drilling to install a groundwater monitoring well.

Cleanup of Groundwater: The process for cleanup of PCE-contaminated groundwater begins with field studies and pilot tests to evaluate which remediation technology is likely to be most effective in removing or destroying the primary contaminant and its chlorinated breakdown products. The geology and hydrogeology in the treatment zone(s) must be carefully assessed, along with the geochemistry of the groundwater. Laboratory tests and field tests will be performed and, depending on the results, a specific technology will be recommended for the cleanup of groundwater.

Recent Reports and the Administrative Record

The NDEP adds reports to the Maryland Square PCE website as these reports become available. The quarterly reports are available at http://ndep.nv.gov/pce/maryland_reports.htm.

- **2nd Quarter 2011 Groundwater Monitoring Report** (July 28, 2011)

Visit our public website any time to read the complete administrative record for the Maryland Square PCE Site, including correspondence, plans and reports: <http://ndep.nv.gov/pce/foia.htm>.

Questions? Contact us with any questions you may have on the Maryland Square PCE Site. You may call the **Maryland Square Resident Call-in Line** at **(702) 486-0975** and leave a message. We will return your call within one to two work days.

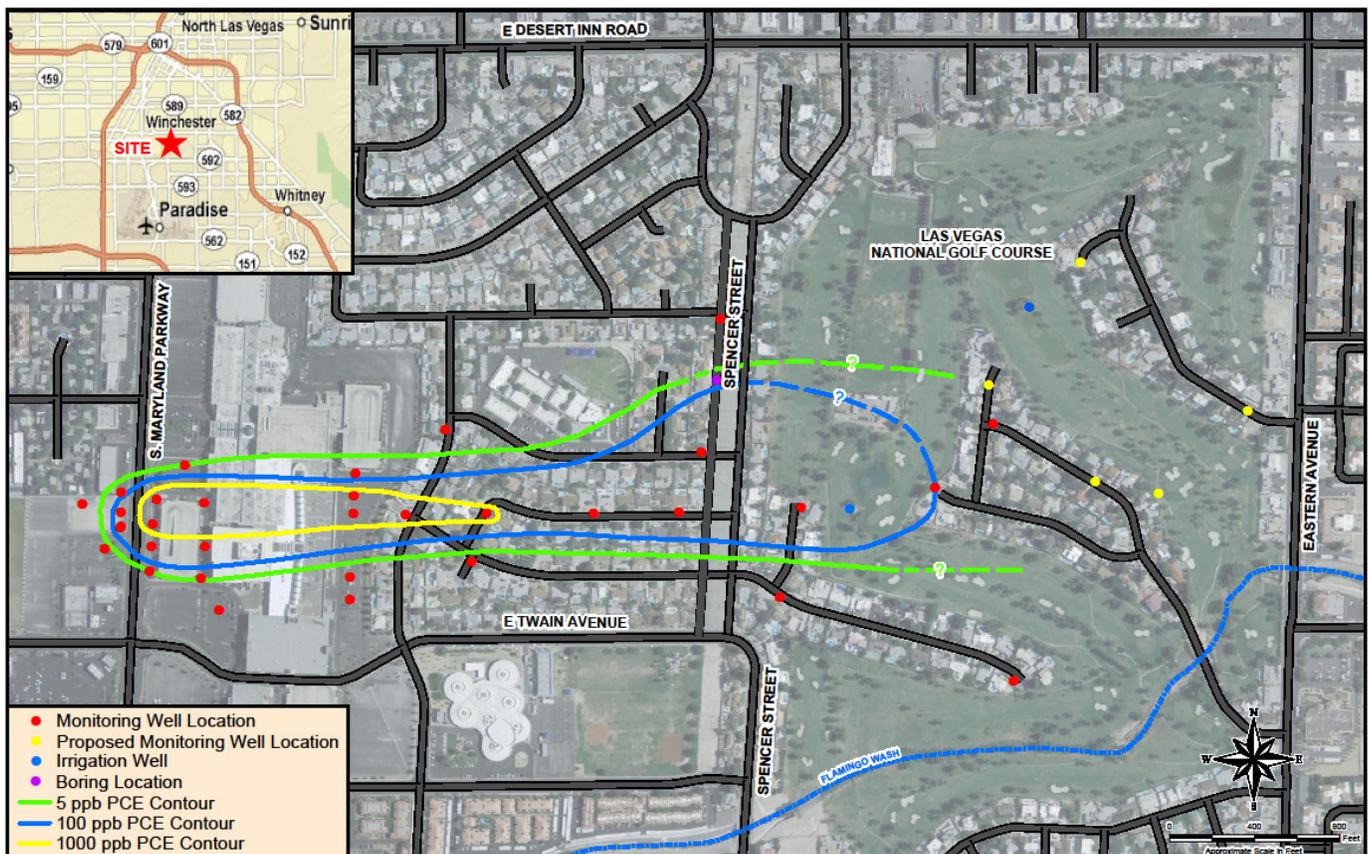
Please Note: City drinking water supplied by the Las Vegas Valley Water District (LVVWD) is **not affected** by this PCE plume. Moreover, municipal drinking water undergoes regular testing to ensure that it meets all federal and state drinking water standards.

The Cleanup Process at the Maryland Square PCE Site

The NDEP's process for evaluating hazardous waste sites begins with characterization of the nature and extent of the contamination. If contamination exceeds action levels and poses an unacceptable risk to human health and the environment, cleanup is required. If determined necessary, short-term mitigation actions may also be taken to alleviate any health concerns.

A **Corrective Action Plan** (CAP) is required before cleanup activities can begin. The CAP summarizes the history of the site and existing information, then discusses and evaluates possible remedies. The CAP also identifies additional information that is needed to thoroughly evaluate which remedy is best suited for cleanup of the site. This additional information may be acquired through bench and pilot-scale testing; sampling; installation of borings, piezometers or monitoring wells; and aquifer testing, among other activities. The NDEP reviews the CAP, provides comments, and either concurs with the plan or requires revision.

A **Corrective Action Report** is prepared after the additional data have been obtained; this document recommends the preferred remedial alternative, and provides plans and a schedule for implementation. Following NDEP review and concurrence, a **Proposed Plan** is prepared for the Maryland Square PCE Site; this Plan will provide a short description of the proposed remedy and solicit public comments on the proposed remedy. The **Record of Decision** (ROD) prepared by the NDEP will memorialize the selected remedy. The Responsible Party (RP) then prepares a **Remedial Design** and **Remedial Action** (RD/RA) plan for the cleanup. Long-term monitoring will follow the cleanup until cleanup goals are achieved.



The PCE plume in groundwater, showing the estimated 5, 100, and 1000 part-per-billion (ppb) concentration contours for PCE. (Note: For reference, the PCE drinking water standard is 5 ppb.)