

Multi-Source Soil and Groundwater Chlorinated Solvent Impacts and Vapor Intrusion Hazard: Investigation, Mitigation and Cleanup

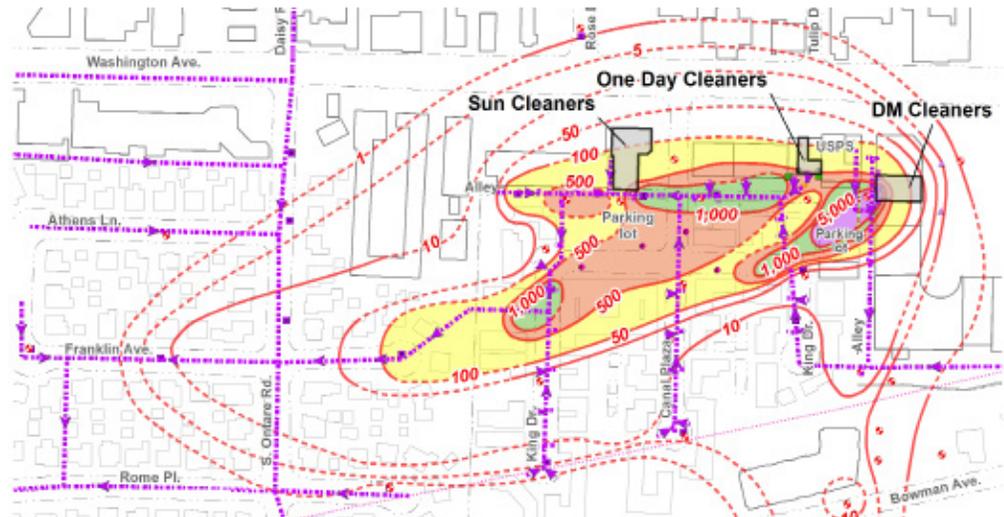
Santa Barbara, California

Client

San Roque Cleanup Fund

Highlights

- ◆ Contaminants of concern: PCE and degradation products
- ◆ Delineated soil, soil vapor, and groundwater chemical impacts across 24-acre plume
- ◆ Assessed site-specific human health risk from residential soil vapor intrusion
- ◆ Monitoring groundwater, soil vapor, and soil moisture
- ◆ Developed soil and groundwater remediation program
- ◆ Developed and led comprehensive public participation program



DBS&A completed a comprehensive groundwater investigation and hydrogeologic conceptual site model to support a vapor intrusion risk evaluation.

Loreto Plaza was converted from farmland to a commercial shopping center in the mid-1950s. Several former dry cleaning businesses at the site and nearby vicinity that used chlorinated solvents conducted operations dating back to the 1960s. Tetrachloroethene (PCE) was also historically released to leaking sanitary sewers that service (and run beneath) a nearby residential and light-commercial business neighborhood. Based on extensive studies conducted by one of its experts in a related litigation matter, DBS&A was retained to provide environmental consulting services.

DBS&A investigated the potential for indoor vapor intrusion by PCE that was volatilizing from groundwater to expose vicinity residents and commercial business employees to unacceptable levels of volatile organic compounds (VOCs). In addition to resolving the vapor intrusion issue, DBS&A was charged with characterizing and cleaning up site soil and groundwater VOC impacts.

DBS&A performed a vapor intrusion risk assessment in accordance with California Environmental Protection Agency (CalEPA) guidance. A preliminary risk screening that utilized pre-existing groundwater data indicated that vapor mitigation may be required within residences. However, DBS&A installed subsurface vapor monitoring probes and performed a site-specific vapor intrusion risk assessment that demonstrated that on-site vapor mitigation is not necessary. Critical to the client's potential legal liability, DBS&A's investigation and quantitative evaluation demonstrated that, while groundwater VOC impacts at the site are relatively extensive, hydrogeologic conditions beneath the site limit the vapor intrusion



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exposure to residents and commercial business employees to levels that are below human health risk thresholds of concern. Site regulators with the Regional Water Quality Control Board (RWQCB), Department of Toxic Substances Control (DTSC), and Office of Environmental Health Hazard (OEHHA) concurred with this assessment.

DBS&A evaluated soil vapor impacts downgradient of the source areas over an approximate 24-acre area. DBS&A installed more than 66 dual-nested soil vapor monitoring probes and instituted a quarterly soil vapor monitoring program. DBS&A also performed in situ measurements of soil diffusivity and collected soil cores for measurement of physical properties to critically inform vapor intrusion modeling. Soil testing procedures were conducted in accordance with CalEPA guidance. DBS&A was able to work with the RWQCB to reduce the monitoring to semi-annual and reporting to annual.



DBS&A field work provided the data that demonstrates vapor mitigation is not needed at the Site.

Soil vapor VOC concentrations exceeded CalEPA "preliminary screening levels" for several chlorinated volatile organic compounds; therefore, a site-specific vapor intrusion evaluation was conducted. Johnson/Ettinger vapor intrusion modeling was used to develop site-specific screening concentrations and estimate incremental cumulative cancer risk and non-cancer hazard. All sampled locations exhibited an incremental cancer risk less than 10^{-4} , so it was determined that vapor mitigation is not currently necessary. Monitoring is continuing.

Ultimately, DBS&A's work at the site will result in cleanup of the relatively extensive VOC groundwater plume at the site and in the vicinity and reduce current and future site financial environmental liabilities for SRCF. DBS&A is developing a public participation program that includes a neighborhood concerns survey, public meetings, an informational website, and a public information fact sheet.

A trustee of the San Roque Cleanup Fund recently commended DBS&A on its work.

"I have worked with many contamination 'experts' over the years, specifically since 1985 when I made it a predominant niche in my law practice. DBS&A is the best of them: prompt, diligent, accurate, and above all, absolutely up to date in every detail with respect to methodology, cost-benefit analysis, and the meaning and effect of the ever-changing regulatory guidelines set by the State of California and the federal government—and that says a lot."

~John DeLoreto, Attorney at Law

