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Bandera Road Ground Water Plume Superfund Site: Information Update (July 2009)

About this Document

At the request of the Bandera Road Community Advisory Group (CAG), this document provides information to Leon Valley residents and workers on the status of the Bandera Road Ground Water Plume (Bandera Road) Superfund site. This information update is the second in a series of updates that will be prepared approximately every six months.

The Bandera Road CAG includes individuals and organizational representatives from the Leon Valley area. The CAG was formed in 2007 to provide input to the U.S. Environmental Protection Agency (EPA) on issues regarding the site's investigation and cleanup. The Bandera Road CAG meets quarterly. Meetings are open to the public. Meeting notices are posted at the City of Leon Valley City Hall at 6400 El Verde Road.

Meeting notices and each information update may be viewed on the City of Leon Valley Web page at www.leonvalleytexas.gov by clicking on the link titled "EPA News – Bandera Road Superfund Site."

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Site Background

The Bandera Road Superfund site is located in the City of Leon Valley, Texas, in the northwestern section of the City of San Antonio. The site area is currently estimated to be approximately one mile long by one half mile wide.

The site consists of ground water contaminated with chlorinated solvents tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (cis-1,2,-DCE or DCE). PCE is the most frequently detected compound.

The Texas Commission on Environmental Quality (TCEQ) identified the site in 2004 while conducting an investigation at the Savings Square Shopping Center, near the intersection of Grissom Road and Bandera Road. In early 2007, the site was placed on EPA's National Priorities List, qualifying the site for long-term cleanup under the Superfund program.

Contamination was found to be entering the Edwards Aquifer, the primary drinking water source for Leon Valley residents, through improperly constructed or deteriorated water wells. EPA is working to properly plug and abandon these wells. Contamination may also be entering the Edwards Aquifer through minor geologic faults and fractures. However, geologic formations present in the area, such as the Del Rio Clay, may help to prevent further contaminant migration into the Edwards Aquifer.

Two City of Leon Valley public water supply wells are located within one mile of the center of the site. These wells have been sampled by EPA on a quarterly basis since November 2007 and have been sampled on a monthly basis since September 2008. To date, these wells have not been affected by contamination.

Several dozen private wells are located in or near the area containing the plume. Six of these wells were identified as being contaminated at levels above Federal Drinking Water Standards. Residences served by these wells were connected to a public water supply. Water well sampling is continuing to ensure additional wells are not being impacted.

Individuals may potentially be exposed to site contaminants through breathing contaminated air, skin contact, eating or accidentally ingesting contaminated soil, or accidentally ingesting contaminated ground water. Now that residents with impacted private wells have been connected to a public water supply, the chances for community contact with contaminated ground water are greatly reduced. Currently, the most likely way individuals may come into contact with site contamination is by breathing in vapor generated from contaminated soil or ground water that can accumulate in indoor air.

EPA is undertaking a number of activities to address potential human health threats at the site and better understand how the site can be cleaned up. These activities are discussed in more detail in this newsletter.

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Recent and Upcoming EPA Activities

Continued Ground Water Monitoring

EPA continues to monitor ground water to understand the extent of ground water contamination at the site. Figure 1 shows the maximum PCE, TCE, and DCE ground water concentrations detected in 2009. As part of its ground water monitoring efforts, EPA has sampled the Leon Valley municipal water wells 13 times since November 2007 (monthly since September 2008 and most recently the second week of June 2009). No PCE or related contaminants have been detected. EPA will continue Leon Valley municipal water well sampling on a monthly basis.

Installing New Wells for Ground Water Monitoring

The movement of contaminated ground water at the site is directly influenced by the interaction among three aquifers: the Austin Chalk Aquifer, the Buda Limestone Aquifer, and the Edwards Aquifer. Since January 2009, EPA has had six Austin Chalk Aquifer wells and two Edwards Aquifer wells installed as part of EPA's ground water monitoring network. EPA uses these wells to monitor water levels and to measure conductivity and temperature. Conductivity is a measure of the ability of water to pass an electrical current, which is affected by dissolved solids in the water. Select wells are being used to determine aquifer characteristics such as response to ground water pumping and capacity for breaking down contamination over time. Ground water samples from select wells are also analyzed for volatile organic compounds (VOCs). An EPA ground water sampling event was conducted the week of June 8, 2009.

EPA may also conduct a Dye Tracer Study with assistance from the Edwards Aquifer Authority (EAA) to measure ground water flow velocity and identify ground water flow directions, hydraulic connections, and the pattern of water movement. This study would involve injecting dye into ground water to see how long the dye takes to move from one well to another.

Properly Plugging or Securing Abandoned or Improperly Constructed Wells

Improperly constructed or abandoned wells in the Bandera Road Superfund site area can act as pathways for ground water contamination to the Edwards Aquifer. With support from EAA, EPA has been identifying such wells and working with property owners to properly plug and abandon or secure them. Since January 2009 EPA has properly plugged and abandoned four wells located near the Savings Square Shopping Center and along Grissom Road. EPA also recently secured an abandoned well which has now been incorporated into EPA's ground water monitoring network. If you discover or are aware of an improperly closed or abandoned well, contact the EAA at (800) 292-1047 or EPA Region 6 immediately. You may also call EPA's Superfund Hot Line at (800) 533-3508. EAA or EPA will then work with the well owner and discuss opportunities for properly closing the well. If you are a well owner, be sure to take all necessary steps to maintain the integrity of your well. Contact EAA if you have any questions about your responsibilities as a well owner.

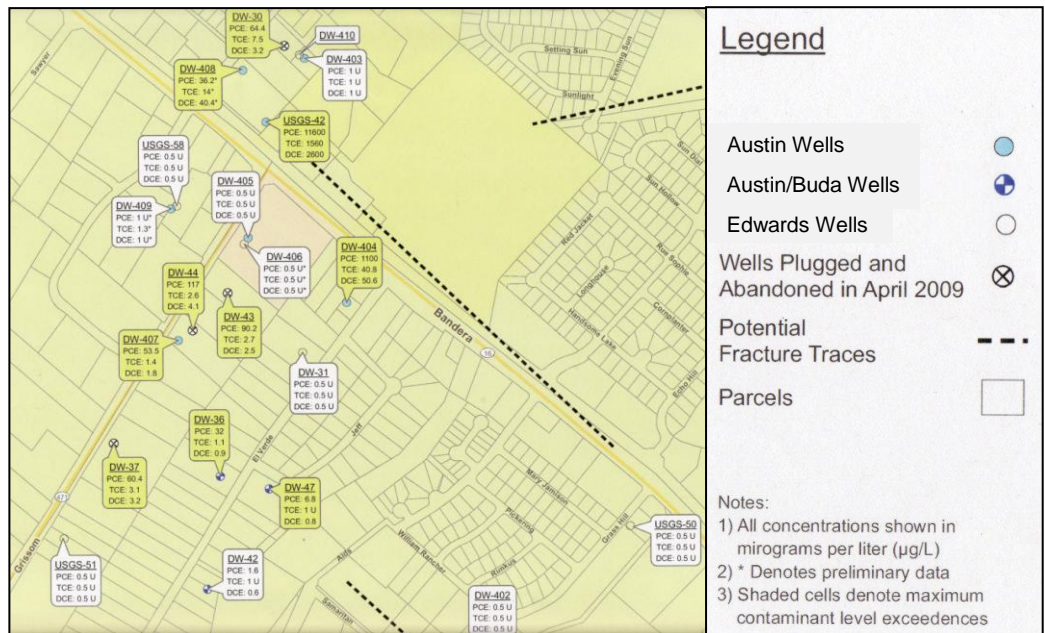


Figure 1. Tetrachloroethene (PCE), Trichloroethene (TCE) and Cis-1,2-Dichloroethene (DCE) Ground Water Sampling Results. Maximum concentrations from samples collected in 2009 are shown. Chemical concentrations are in units of micrograms per liter ($\mu\text{g/L}$) which are equal to parts per billion (ppb; see box below). EPA's Maximum Contaminant Level for PCE, for example, is $5 \mu\text{g/L}$. A "non-detect" sample, identified above with a "U", indicates that no concentration of PCE was detected above the lowest level that could be detected by laboratory equipment (i.e., $0.5 \mu\text{g/L}$). A "detect" sample indicates that some level of PCE was detectable in the sample. [Note: Circles indicate a well. The legend indicates if the well is completed in the Austin, Austin/Buda, or Edwards aquifers, or if the well was plugged and abandoned in April 2009.]



Figure 2. In January 2009, EPA secured an abandoned well.

Soil Sampling

In late 2008, EPA conducted passive soil gas sampling at the Savings Square Shopping Center in order to identify if chemicals were present in soil gas. This sampling did identify volatile chemicals present in the soil gas, particularly around the location of a former dry cleaning facility that had previously operated in the shopping center. In January 2009, passive soil gas sampling was also conducted at the Northside Learning Center – no chemicals were detected in the Northside Learning Center soil gas samples.

In April 2009, EPA conducted soil sampling at the shopping center. Samples were collected for analysis of VOCs, soil moisture, and *Dehalococcoides* organisms, which can break down DCE to vinyl chloride and into less harmful chemicals. *Dehalococcoides* organisms were detected in both soil and ground water samples. After soil boring was complete, the boring holes were modified for use as vapor monitoring wells. Additional evaluation of the sample data from the soil boring work is planned.



Figure 3. Recent soil sampling activity at the Savings Square Shopping Center.

Soil Vapor Intrusion Investigation, Monitoring, and Mitigation

In late January 2009, EPA conducted a vapor intrusion study in the area around the former dry cleaning facility at the Savings Square Shopping Center and at the Northside Learning Center. EPA contractors collected indoor, sub-slab, and crawl space air samples to determine if PCE and other chlorinated solvent vapors were present. EPA presented the results of the study to building tenants where sampling took place at a March 10, 2009 meeting at the Leon Valley Community Center. At EPA's request, the Texas Department of Health Services (TDSHS) conducted a Health Consultation based on its review of the indoor air vapor intrusion sampling data. TDSHS concluded in their Health Consultation that with the exception of the building space of the former dry cleaners, the occupied spaces pose no apparent public health hazard. In cooperation with the affected property owner, an exterior vapor mitigation system was installed. The system pulls vapor from underneath the slab and discharges it to open air; the system has been operating since March 2009. Follow-up indoor vapor intrusion sampling conducted in April 2009 found a substantial reduction in the concentration of PCE from the January 2009 sampling. Vapor mitigation efforts will continue.



Figure 4. Example of vapor mitigation system recently installed at the Savings Square Shopping Center.

Getting to Know Superfund Terms and Phrases

ppm and ppb - Parts per million (ppm) and parts per billion (ppb) are measurement units commonly used to express contamination ratios. These units may be used, for example, to express the maximum permissible amount of a contaminant in water, soil, or air or the measured amount of a contaminant present in water, soil, or air. A contaminant measured at 1 ppm in local ground water would be like a cup of water in a large swimming pool. A contaminant measured at 1 ppb would be like a drop of water in the same large swimming pool.

Risk level - EPA reviews a number of different factors when considering the most appropriate long-term cleanup option for a site. One factor is the extent to which various cleanup options, including a “no action” cleanup option, will achieve EPA goals for risk reduction. EPA's general acceptable risk range falls between 1×10^{-4} to 1×10^{-6} . These numbers represent the lifetime cancer risk resulting from exposure to hazardous substances at a Superfund site. A risk level of 1×10^{-4} represents a “1 in 10,000 chance” (a risk level of 1×10^{-6} represents a “1 in 1,000,000 chance”). This means that for every 10,000 (or 1,000,000) people exposed to the hazardous substances at a site at the highest level that is likely to occur, one extra case of cancer may occur beyond what would be expected from all other sources located at the site. Depending upon a variety of factors, EPA will ultimately select a cleanup option falling within EPA's acceptable risk range between 1×10^{-4} and 1×10^{-6} .

For More Information

EPA Region 6 Bandera Road Ground Water Plume Site Summary (<http://www.epa.gov/region6/6sf/pdf/files/0606565.pdf>)

EPA Terms of Environment (<http://www.epa.gov/OCEPAterms/aterms.html>)

EPA Superfund Today: Focus On Risk Assessment (http://www.epa.gov/superfund/community/today/pdfs/sf_com.pdf)

EPA Citizen's Guide to EPA's Superfund Program (http://www.epa.gov/superfund/students/clas_act/haz-ed/9thissf.pdf)

Phases of the Superfund Process

1. Preliminary Assessment and Site Investigation (PA/SI)
2. National Priorities List (NPL) Listing Process
3. **Remedial Investigation and Feasibility Study (RI/FS)**
4. Proposed Plan – Record of Decision (ROD)
5. Remedial Design / Remedial Action (RD/RA)
6. Construction Completion
7. Post-Construction Completion

What Phase is the Bandera Road Superfund Site in Now?

The long-term cleanup process of Superfund sites involves several phases. The Bandera Road site is currently in what is referred to as the Remedial Investigation/Feasibility Study (RI/FS) phase. As part of this, EPA is leading a detailed study of the site to identify the cause and extent of the contamination at the site and possible threats to the environment and people nearby (Remedial Investigation). It is also beginning to identify options for cleaning up the site (Feasibility Study). Together, these efforts will help inform EPA's Proposed Plan for the site. When completed, the Plan will describe the various cleanup options that could potentially be used to remediate site contamination and highlight the cleanup option(s) EPA prefers. Once EPA makes the Proposed Plan available to the public, Leon Valley residents and workers will have an opportunity to provide input on the Plan. After public concerns are addressed, EPA will publish a Record of Decision (ROD), which describes how EPA plans to clean up the site. EPA will then develop the final design to guide implementation of the cleanup option(s) selected. Afterward, the bulk of site cleanup will begin.

