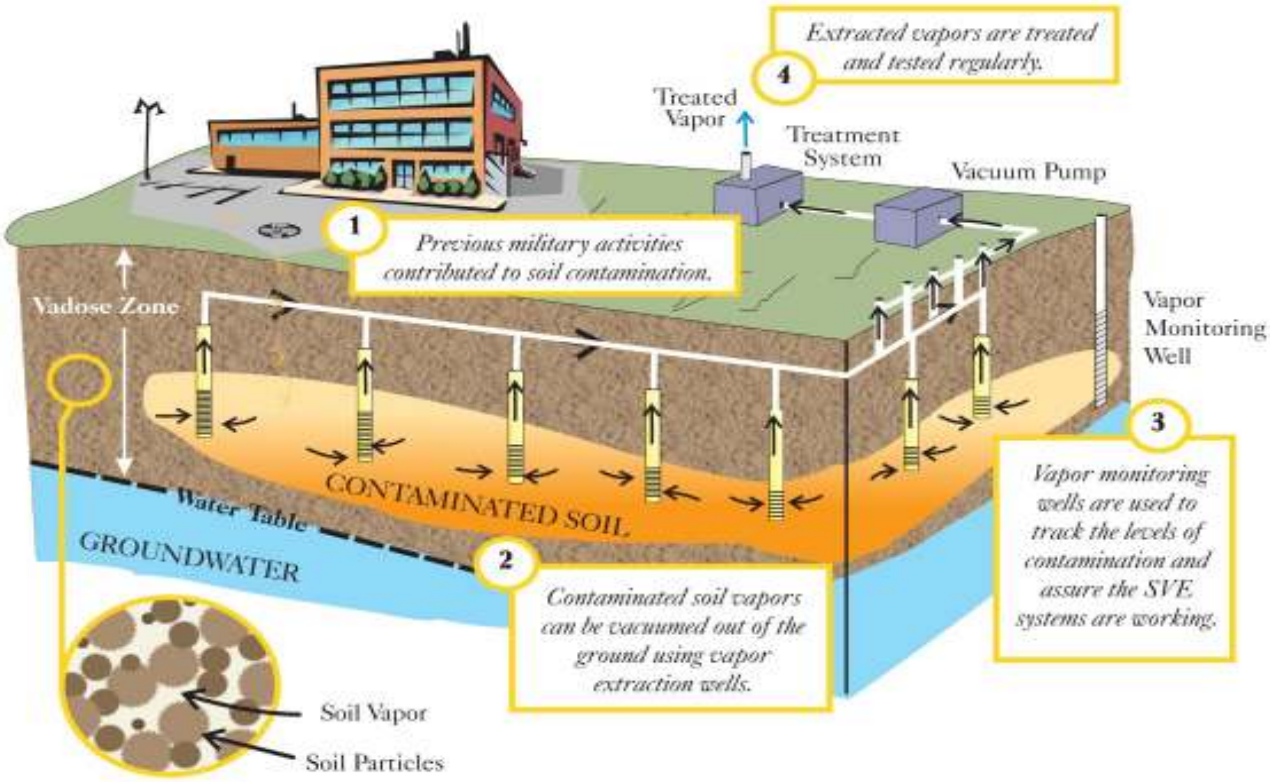
Former

Williams Air Force Base

Mesa, Arizona

Site ST035 Soil Vapor Extraction

November 2010



Site ST035 at a glance

- Former base gas station from 1960s-1986
- Gasoline leaked into soil/groundwater many years ago
- Site remains safe for school/work/living
- Cleaning up benzene, EDB, MTBE, 1,2-DCA
- Deep aquifer used for drinking water is not affected
- Air Force samples groundwater quarterly
- Air Force has started soil vapor extraction on site to clean soils

This illustration depicts how soil vapor extraction (SVE) technology operates. SVE is used at site ST035 to remove contaminants from the vadose zone, which is soil above the water table. Soil vapor is gas that exists in the spaces between soil particles. Soil vapor contains air, evaporated water, and in some cases at site ST035, gasoline products that leaked into soil. Many gasoline products evaporate ("volatilize") easily and are known as volatile organic compounds or "VOCs". The SVE system is designed to remove these volatilized gasoline products from soil.

SVE technology essentially introduces a vacuum to wells that were drilled through soils in the vadose zone. The wells pull soil vapors from the vadose zone, through the vacuum system and into a thermal oxidizer. This oxidizer effectively removes more than 99% of the VOCs using very high heat.

The remaining air (free of VOCs) is released into the atmosphere in compliance with air quality emissions standards. Treated vapors are tested to ensure protection of human health and the environment.

Site ST035 Soil Vapor Extraction (continued)

Site ST035 (also known as Building 760) is the site of the former Williams Air Force Base gas station, which operated for 20 years from the mid-1960s until 1986. The site now forms part of Arizona State University's (ASU) Polytechnic campus.

During the years the gas station was operated, gasoline leaked into soil and groundwater at the site through a leak in the elbow joint of a pipe that ran from one of the six underground storage tanks (USTs) to the dispenser island. The leak was discovered when all tanks, dispensers and piping were removed from the site in 1993, following base closure.

As a result, soil and groundwater at the site is contaminated with benzene, ethylene di-bromide (known as EDB), methyl-tertiary-butyl ether (known as MTBE) and dichloroethane (known as 1,2-DCA), which are components of gasoline or gasoline additives.

In 1996, the Air Force deeded the site to the Arizona Board of Regents through the U.S. Department of Education. Although the site is now part of the ASU's Polytechnic campus, the Air Force is still legally and financially responsible for its cleanup. Cleanup at the site is regulated by the Arizona Department of Environmental Quality (ADEQ) as part of its UST program.

Since this location houses an academic complex, the health and safety environment are closely monitored, both through long-term, quarterly groundwater monitoring and regular testing of emissions associated with the new soil vapor extraction system on the site.

The Air Force began a groundwater monitoring program at ST035 in 1997 and currently tests groundwater quarterly for concentrations of benzene, toluene, ethylbenzene, and xylenes (known as BTEX), as well as MTBE, EDB and 1,2-DCA.

The primary contaminant of concern (CoC) at the site is benzene. Other CoCs that exceed ADEQ's UST Tier 1 cleanup standards are EDB, MTBE and 1,2-DCA. These chemicals are components of gasoline or gasoline additives and are commonly found around gasoline storage facilities that have experienced leaks.

The Air Force, contractors and regulators are working together to evaluate this data and determine the optimal remedy for groundwater at the site. Meanwhile, the Air Force has started soil vapor extraction (SVE) at the site to clean any contaminated soil. SVE treatment also prevents further contaminants from migrating from the soil into groundwater.

Photo by Bill Timmerman

The Air Force partnered with Arizona State University and state environmental regulators to integrate plans for a new soil vapor extraction system and network of groundwater monitoring wells into designs for the university's new, environmental award-winning academic complex on the Polytechnic campus in Mesa.

During construction of its new academic complex at the site, the Air Force worked closely with ASU to integrate piping for the SVE system into an arroyo bridge, and around sidewalks, roads and landscaping.

In 2008, the Air Force installed 15 SVE extraction wells (in five locations) and 21 soil vapor monitoring points (in seven locations) at the site and conducted a pilot test of the system.

Based on the pilot test results, the Air Force designed the SVE system to be fully integrated into its surroundings and to effectively treat the site while taking university operations into consideration. For example, the system is surrounded by a sound dampening wall to ensure noise levels are kept below 65 decibels at the nearby Administration Building.

Human health and safety and the environment remain the top priorities. The SVE system received all required emissions permits from the Maricopa County Air Quality Department. Extracted vapors are tested regularly to ensure the system is working effectively and emissions are clean and safe.

The Air Force will continue to partner with ASU and regulators on the cleanup of soil and ground-water at site ST035. Additionally, regular updates on site cleanup are provided to the public at the quarterly Williams Restoration Advisory Board meetings and through the Information Repository.

Contacts:

Air Force Real Property Agency
Linda Geissinger, Western Region Public Affairs Officer
916-643-6420, ext.109 or toll free 866-725-7617
linda.geissinger@us.af.mil

Arizona Department of Environmental Quality
Adam Mohamed, Underground Storage Tank Program Project Manager
602-771-4305
aam@azdeq.gov
or
Andre Chiaradia, Federal Projects Unit Project Manager
602-771-2296
Chiaradia.Andre@azdeq.gov

Interested in learning more?

- **Explore the online administrative record (AR): https://afrpaar.lackland.af.mil/ar/docsearch.aspx**
- **Visit the Williams Information Repository at the Federal Depository, Hayden Library, on the ASU campus in Tempe**
- **Attend public Restoration Advisory Board and other advertised public meetings**
- **Sign up to be added to the mailing list by calling 916-643-6420, ext.109**