K-STATE Research and Extension
Department of Agronomy MF3096 Brownfield Sites

Gardening on Brownfields: Historical Property Usage and Implications

Before establishing a garden on a previously used property, it is important to know what the historical uses of the site were and what contaminants may affect the soil. For information on how to research former property uses, see the K-State Research and Extension publication *Gardening on Brownfields: Obtaining Property Information and Site History*, MF3078.

Following are former property uses and their implications for soil quality.

Former Residential Use

Residential sites are the most innocent appearing former use; yet, undesirable "leftovers" could be in the soil.

Potential contaminants include the following:

- Lead from lead-based paint.
- Arsenic from the use of arsenical pesticides.
- Asbestos from insulation (boiler and pipe wrap), shingles, or floor tiles. Asbestos may get into the soil if structures are improperly demolished.
- Metals from coal ashes.
- PAHs (polycyclic aromatic hydrocarbons) from incomplete combustion of carbon-containing fuels (such as wood, coal, and diesel fuel)
- Pesticides, such as DDT (dichloro-diphenyl-trichloroethane), DDE (dichloro-diphenyl-dichloroethylene), and chlordane, used to spray for insects along foundations. The use of DDT was banned in the United States in 1972, but DDT is persistent in soil. DDE is a breakdown product of DDT.
- PCBs (polychlorinated biphenyls) from leaking transformers, capacitors, and other electrical equipment. PCBs are persistent in soils.

Former residential lots may harbor contaminants not easily identifiable without testing.

Abandoned service station sites present many issues for future use.

Former Service Station

Along with the gasoline or diesel, service stations often offered oil changes and mechanical repairs for automobiles.

Potential contaminants include the following:

- Metals and metalloids: arsenic, cadmium, and mercury from waste oil; persistent in soil.
- Benzene, volatile.
- Toluene, volatile.
- Ethylbenzene, volatile to semi-volatile.
- Xylene(s), volatile to semi-volatile.

Benzene, toluene, ethylbenzene and xylene(s) are constituents of petroleum hydrocarbons such as gasoline and diesel fuel.

Former Dry Cleaning Operation

Dry cleaning operations and the solvents they used were not always regulated. Solvents were often not disposed of properly, and accidental spills occurred.

Associated potential contaminants include:

- Chlorinated solvents such as:
  - » PCE/tetrachloethylene/PERC, volatile.
  - » TCE (trichloroethylene), less volatile than PCE, relatively persistent in soil and water.

Former Orchard

Fruit trees are sprayed with insecticides.

Associated potential contaminants include:

- Pesticides; some are persistent in soils.
- Arsenic, from arsenate-containing pesticides; persistent in soils.
- Lead from pesticides; persistent in soils

Former Grocery Store

The area around grocery store foundations may have been sprayed to deter rodents. This may be true for former residential properties as well.

Associated potential contaminants:

- Pesticides; some are persistent in soil.
- Arsenic from arsenical pesticides; persistent in soil.

Former Manufacturing Facility

Whatever was used in the manufacturing process could still be in the soil and have environmental implications.

Associated potential contaminants include:

- Solvents; some may be persistent in soil.
- Metals from paints; persistent in soil.
- Persistent organics.

Sites of former manufacturing facilities, such as this former Kansas City thermometer manufacturing site, may pose hazards for future use.

Sabine E. Martin, Ph.D.
Adjunct Professor
Hydrogeology, Brownfields, and Redevelopment

Ganga M. Hettiarachchi, Ph.D.
Professor
Soil and Environmental Chemistry

This publication was produced as part of the outreach for EPA grant number TR-83416101. Contact us at Kansas State University, Department of Agronomy, 2004 Throckmorton Plant Sciences Center, Manhattan, KS 66506; website: *www.gardeningonbrownfields.org*

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF3096 November 2017