

Environmental Health Resources Self Learning Module

Land Reuse Sites



**Agency for Toxic Substances
and Disease Registry**
Division of Community
Health Investigations



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Overview and Objectives

This module has been created to provide local health agencies a quick overview of land reuse sites as well as optional, more in-depth self-study resources. While geared to local health departments (LHDs), the materials may be useful for other environmental health professionals.

Objectives:

- Gain familiarity with land reuse **terminology**
- **Raise or enhance understanding** of land reuse and the role of local health agencies
- Use the modules to **prepare for community engagement** or more detailed engagement (e.g. funding) in communities with land reuse sites, such as landfills, brownfields, or corrective action sites



Module Organization

This Brownfields and Land Reuse Sites resource is organized by:

1. A [printable summary](#) of land reuse basics.
2. A [self-study module](#) that contains more detailed training and resources about land reuse sites.

Land Reuse Sites

Part One: **Summary Overview**





Land Reuse Sites: ATSDR Definition



Images of abandoned drums and an above-ground storage tank, ATSDR 2015

The Agency for Toxic Substances and Disease Registry (ATSDR) defines land reuse sites as a class of potentially contaminated or hazardous waste sites that are designated for reuse, or simply “[land reuse sites](#)”.

Land reuse sites may include:

- Brownfields
- [Superfund](#) or other potentially hazardous waste sites
- Underground or above ground oil storage areas, among many others

The majority of potentially hazardous sites are brownfields. ATSDR follows the same guidance and procedures to assess all types of potentially hazardous sites, whether brownfields or other land reuse sites, to protect people from harmful exposures that may be associated with these sites.



Brownfields: US Environmental Protection Agency (EPA) Definition

Potentially hazardous sites are numerous and occur across the globe. The term “brownfields” is now commonly recognized and used to refer to potentially contaminated sites, such as old factories, under-utilized sites, or former military installations.

The US EPA definition of Brownfields is:

“real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.”

Brownfield sites range from former residential properties, service stations, and dry cleaning operations to commercial and industrial properties.

Brownfields are not always vacant sites, they can be “underused” sites—potentially contaminated sites where an alternative use would be beneficial to the community.

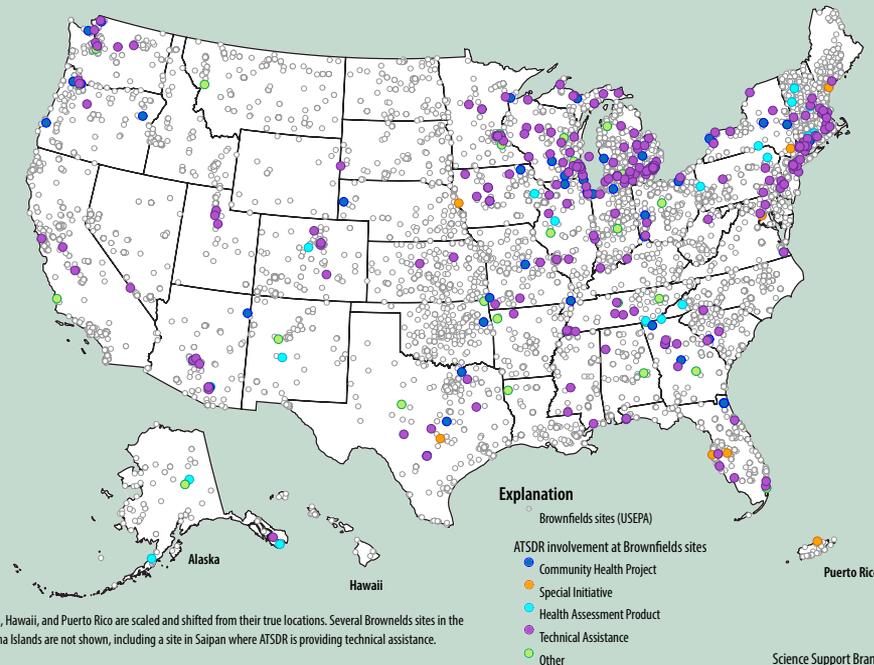


Images of brownfields, ATSDR 2013



Where are Brownfields Sites?

In this map, ATSDR activities at brownfields sites across the country are shown. The sites designated by **gray circles** represent over 22,000 USEPA Brownfields sites. The **colored circles** represent ATSDR community health projects, special initiatives, health assessment products, technical assistance, and other assistance projects.



The US Environmental Protection Agency (USEPA) Brownfields sites shown (open grey circles, n=22,885) are those that USEPA Brownfields Program grantees have voluntarily entered in the Brownfields Assessment, Cleanup and Redevelopment Exchange System (ACRES). These sites represent a small percentage of the estimated 450,000 or more brownfields in the United States. USEPA ACRES data are from a comprehensive geodatabase available at <https://www.epa.gov/enviro/geospatial-data-download-service>, downloaded on May 25, 2016. Information about ATSDR involvement at Brownfields sites is from ATSDR Region 4 data, May 19, 2016.

Science Support Branch
data organization • analysis • visualization

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How Many Land Reuse Sites Exist?

The U.S. Conference of Mayors and the General Accountability Office (GAO) estimate that there are over 450,000 brownfields sites in the United States. Others have estimated that the number of brownfields are over 1,000,000.

The true number of brownfields is not known, and these sites are expanding due to foreclosures, abandonment, and discovery of new sites.

In comparison, there are about 1378 [National Priorities List](#) (NPL) and over 3000 [Resource Conservation and Recovery Act](#) (RCRA) corrective action sites.

This means that brownfields are at least 60 times more prevalent than other types of land reuse sites.

NPL sites, or “Superfund” sites tend to have extensive contamination and or present more complicated exposures to contaminants than many brownfields sites. [RCRA corrective action sites](#) may be smaller than brownfields sites and can include manufacturing or other facilities, such as steel mill sites, at which waste has been mismanaged, such as a spill of chemical waste.



Regardless, the large number of brownfields in the U.S. and their potential to have hazardous conditions can cause concern for municipalities, residents, environmental advocates, and regulators.



Brownfields in the Midwest. Images by L. DeGrane, with permission.

500,000 Brownfields

1,387
NPL

3,000+
RCRA

Brownfields
> 60 times
more sites

Brownfields are the greatest number of potentially contaminated sites that pose threats to community health.

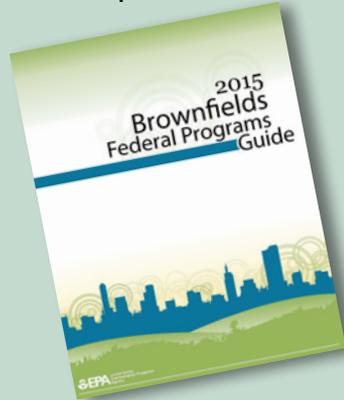


Federal Agency Roles

Both EPA and ATSDR provide funding and technical assistance to communities with brownfields and land reuse sites

[EPA's Brownfields Program](#) provides grants and technical assistance to communities, states, tribes and others to assess, safely clean up and sustainably reuse these contaminated properties

[ATSDR's Brownfield/Land Reuse Health Program](#) provides grants and promotes health, community involvement, partnerships, communication, and education to safely reuse land, reduce exposures to contaminants, and improve community health.



Other federal agencies provide funding and resources that can be used to address brownfields and associated effects on communities. See the EPA [2015 Brownfields Federal Programs Guide](#) or simply click on the cover image.



The EPA Brownfields and Land Revitalization Program

At the federal level, the [EPA Brownfields and Land Revitalization Program](#) empowers states, communities, and other stakeholders in economic redevelopment to work together to prevent, assess, safely clean up, and sustainably reuse brownfields.

To learn more about the [EPA Brownfields and Land Revitalization Program](#), access the [SELF STUDY Module](#).

The screenshot shows the EPA website's 'Brownfields' page. At the top, there is the EPA logo and navigation tabs for 'Learn the Issues', 'Science & Technology', 'Laws & Regulations', and 'About EPA'. A search bar is located on the right. The main heading is 'Brownfields', followed by a paragraph explaining the program's purpose. Below this, there are two columns of links: 'Basic Information' (including 'Brownfield Overview and Definition', 'Program Accomplishments and Benefits', 'Laws and Regulations', and 'Liability and Enforcement') and 'Competitive Grant Funding Information' (including 'Types of Grant Funding', 'Grants Fact Sheets', 'Apply for Grant Funding', and 'Learn More About Other EPA Grants'). On the right side, there are sections for 'Current News and Highlights' and 'Current Funding Opportunities', each with a list of recent announcements and links. The page also features images of brownfield sites and a person writing.

Screen capture of EPA Brownfields Website, 2016



The ATSDR National Land Reuse Health Program

Community health considerations are important parts of ATSDR's land revitalization activities.



Left to right: images of a vacant school (2016), a former industrial building (2009), open dumping in an abandoned building (2009), and old fuel tank (2014).

Through its [Land Reuse Health Program](#), ATSDR works to:

- **promote a well-rounded approach** to redevelopment
- **include health** as an important part of redevelopment
- **grow community resources** to promote health
- **measure changes** in community health
- **encourage early community involvement** in decision making



- **restore and revitalize communities** in a way that is fair to all community groups
- **promote relationships** among, agencies, partners, and communities
- **improve ways to talk about health** and environmental risks

ATSDR has special programs, tools, and resources to support local health agencies and communities in reducing harmful exposures and promoting healthy redevelopment.

To learn more about the [ATSDR Land Health Reuse Program](#), access the [SELF STUDY Module](#).



Environmental Regulatory Roles

EPA works with state environmental programs through Voluntary Cleanup Programs (VCPs) to address the cleanup of brownfields and to build program capacity.

The VCPs allow individual states and tribes to provide oversight of brownfields cleanups.

To learn more about the state VCPs, access the [SELF STUDY Module](#) .



Involving Health Agencies in Land Reuse

Health agency involvement in land reuse can focus on community health monitoring: evaluating health risk from exposure to contaminants; community involvement; health and risk communication; crime or injury prevention; community health care and services; and may also include:

- **Educating community residents** about environmental health issues and cumulative stressors that impact health
- **Targeting other chronic disease prevention**, health education or other complementary activities in land reuse sites areas
- Developing or working with existing local or state inventories of land reuse sites and vacant properties and **assessing site proximity to sensitive populations**
- **Inviting health agencies to serve** on land reuse and redevelopment planning teams
- **Evaluating community awareness of land reuse sites** or site contaminants and developing fact sheets and multilingual information about contaminants for nearby residents
- **Planning redevelopment** to consider and improve public health



Local, state, tribal governments as well as units of local governments and quasi-governmental agencies, including health departments, can apply for [EPA grant funds](#) to assess or clean eligible brownfields sites or [ATSDR grant funds](#) to address community health associated with land reuse sites.

Through the ATSDR Cooperative Agreement Health Assessment Program, State Health partners have conducted over 270 [health consultations or assessments](#) specifically at brownfields sites.

In these assessments, state health agency staff reviewed environmental data, such as soil or air concentrations of site contaminants to determine the effects on public health for residents living near or accessing these sites.

State health agency staff follow the same guidance and procedures to assess brownfields sites as they do to assess all types of potentially hazardous sites.



Local health agency partners may assist in providing data or engaging the local community during the health consultation or assessment process.

Local and state health departments are eligible to receive funds to address issues at land reuse sites. As an example, local and state health departments received [ATSDR funding](#) for several years. Example projects include:

- **conducting health impact assessments** of how a redevelopment may impact community conditions
- **creating community-driven indicators** of community health over the course of redevelopment
- **addressing food deserts** through agriculture projects
- **creating “Healthfields”**—redeveloping land reuse sites to create clinics, schools, grocery stores, and other amenities

As more land is revitalized, the role of local health departments may expand, helping to bridge the gap between land revitalization from an economic development perspective to that of a community health perspective.



Examples: Local Health Agencies and Land Reuse Projects

At the local level, health officials may be asked to provide public health support such as risk assessment, risk communication, site assessment support, and other expertise.

In **Oregon**, **two local health agencies** worked with Oregon Health Authority to assess community concerns and engage residents in redevelopment strategies to improve health. These local health agencies received funding from Oregon Health Authority through an ATSDR grant.



*Blood Lead Screening event during a Blue Island Health Fair
(ATSDR image, 2011)*

In **Blue Island, Illinois** the **Cook County Department of Public Health** helped the city of Blue Island understand the remediation process and potential contaminants associated with the redevelopment of a former manufactured gas plant.

In addition, they participate in community events to provide health education to residents about lead exposures associated with brownfields and older housing stock.



The **Sauk County Health Department** benefited from a Health Monitoring allocation under an EPA Brownfields Assessment Grant to the City of Baraboo, Wisconsin. The Sauk County Health Department helped lead an [ATSDR Action Model](#) project to envision riverfront revitalization.

Sauk County Health Department staff facilitating a community health event as part of a redevelopment plan (ATSDR image, 2008)



Cuyahoga County Board of Health applied ATSDR grant funding to collaborate with local government, a school district, the local hospital, county community development, grassroots organizations, community members, and other partners to establish the East Cleveland Health and Development (H&D) Committee.



Community garden in Cuyahoga County, Ohio (ATSDR image, 2009)

Between 2007 and 2011, the **H&D Committee started 9 community gardens** with more than **130 gardeners**, reinvigorated a local farmers market, **built 4 new playgrounds**, passed an **urban agriculture resolution**, **engaged 2,077 youth** in environmental justice education, and **conducted numerous events** to engage the community.



End of summary overview.

For a hard copy of the Land Reuse Sites **summary overview**,
print pages 5–21.

Proceed to the [self-study module](#) on Land Reuse Sites.

Land Reuse Sites

Part Two: **Self-study Materials**





ATSDR Land Reuse Resources

For information about ATSDR's National Land Reuse Health Program, visit this website: <http://www.atsdr.cdc.gov/sites/brownfields/>. You can also watch this ATSDR webinar to learn more about land reuse sites and tools and resources you can use to help communities with land reuse:

ATSDR and Brownfields/Land Reuse Health Initiative



Webinar: Improving Community Health
through Land Reuse and Development
November 8, 2012
2:00 – 3:00 EST

*To hear audio you MUST
call into the number listed
below:
(877) 820-7831
Passcode: 569858*

The findings and conclusions in this report have not been formally disseminated by the Agency for Toxic Substances and Disease Registry and should not be construed to represent any agency determination or policy.



U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry



Visit ATSDR's National Land Reuse Health Program website to

- Learn more about [Redeveloping into a Healthy Community](#)
- View [videos that showcase healthy redevelopment](#)
- Access and download tools and resources:
 - » The [ATSDR Action Model](#) helps communities find ways to make health part of the redevelopment process
 - » The [Community Health and Site Inventory Tools](#) helps environmental and health professionals identify and catalog contaminants and health concerns associated with property
 - » The [Community Partnerships Project](#) is a network with a wide range of expertise facilitating community health improvements in redevelopment plans
 - » [Meet our Stakeholders](#) who are experts from a diversity of agencies and fields.
- View our past [Funding Opportunities](#)
- Read our [Publications](#)
- Learn about [Success Stories](#)



ATSDR has numerous resources focused on land reuse (e.g., hazardous waste) sites. These include:

The ATSDR Land Reuse [Site Screening Tool](#)

ATSDR Land Reuse Site Screening Tool

This tool provides two functions: 1) searchable inventory and 2) compares environmental sampling data to health comparison values. Note: neither exposure dose calculations nor cancer risk estimations are included in this tool.

Vacant lots Old gas stations Abandoned factories Polluted waterfronts

- Enter, View, Query, or Print Site Data
- Import Inventory data from a Spreadsheet
- Exit

This tool allows users to rapidly assess sites by site history, proposed use, contaminants, and future use.



The EPA Brownfields and Land Revitalization Program

Brownfields are the most numerous and common type of land reuse sites. The EPA provides a detailed overview of its brownfields and land revitalization program. You can explore this [EPA website](#) to learn about the definition of brownfields, grants and funding, state programs, and other resources that help communities address brownfields.



Acquiring and Assessing Brownfields Properties

The EPA has guidelines and standards for acquiring and assessing brownfields properties that also provide property owners with a liability defense against [CERCLA](#).

For example, prior to acquiring or accepting a donated brownfield property, it is important to conduct due diligence activities, as described in the EPA Anatomy of Brownfields Redevelopment (2006): https://www.epa.gov/sites/production/files/2015-09/documents/anat_bf_redev_101106.pdf



During the due diligence process, the property is evaluated to identify potential environmental contamination. The property is also assessed for potential liability for any contamination present at the property.

As part of due diligence, a **Phase I environmental site assessment (ESA)** identifies potential environmental concerns. It establishes historical and current uses of the site, and activities at the site and surrounding area.



State health department employee conducting a site assessment (ATSDR, 2008).

The Phase I ESA typically includes:

- Records searches
- Interviews with property owners
- Site visit

If required, a **Phase II ESA** may be conducted to sample or test for specific hazards that may have been identified in the Phase I ESA.

The Phase II ESA evaluates recognized environmental concerns identified during the Phase I ESA and evaluates whether there has been a release of a hazardous substance at the site.



The ultimate goal of a Phase II ESA is to determine if environmental cleanup of the property will be necessary.

The EPA requires that only **licensed environmental professionals** conduct Phase I and Phase II ESAs following ASTM International Standards ASTM E1527-13 and ASTM 1903-11, respectively. These standards are available for purchase from ASTM International. Because ASTM E1527-13 does not address asbestos, lead paint or controlled substances, assessment of these additional contaminants needs to be identified in the initial scope of work.

For an overview of PHASE I ESAs, access: [Kansas State University TAB Brownfields Resources](#)  —Phase I Environmental Site Assessments.



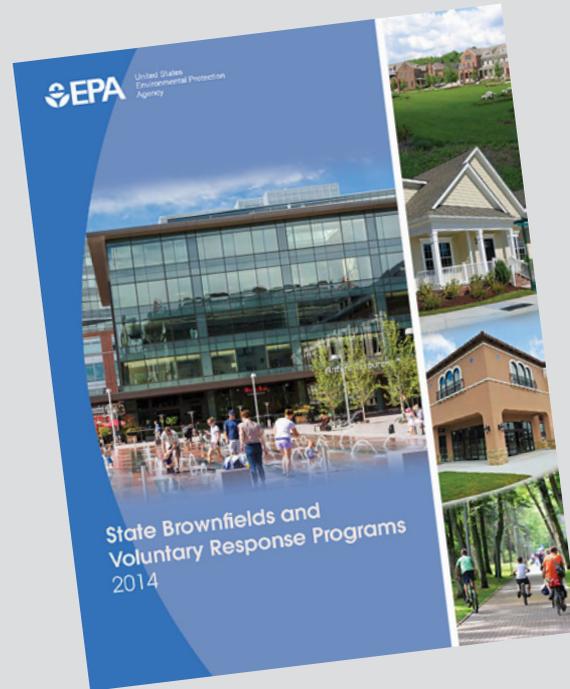
In many states, a **No Further Remediation Letter** is issued to Remediation Applicants who have demonstrated, through proper investigation (e.g. Phase I and Phase 2 ESAs) and any necessary remedial action, that all environmental conditions at their sites no longer present a significant risk to human health and the environment.

Example: “No Further Remediation” letter Illinois definition <http://www.epa.illinois.gov/topics/cleanup-programs/srp/overview/index> 



Cleanup of Brownfields Sites

With support from CERCLA 128 (a) funding, state brownfields programs oversee assessment and cleanup activities at the majority of brownfields properties across the country. To learn more about state programs, click the [EPA State Brownfields and Voluntary Response Program](#) document.





State Programs: A Tiered Approach to Brownfields Cleanup

The Michigan Department of Environmental Quality provides a useful example of the tiered approach to cleanup here: [http://](http://www.michigan.gov/eq/0,1607,7-135-3311_4109_4215-17592--,00.html)

www.michigan.gov/eq/0,1607,7-135-3311_4109_4215-17592--,00.html 

Tier 1 consists of a qualitative risk-assessment based on general site assessment information. At this stage, data identifies obvious environmental impacts:

- Sensitive receptors (e.g., schools, homes, water bodies)
- Significant exposure pathways (drinking water wells, vapor transport, other)



Tier 2—more site-specific data is utilized to determine the appropriate risk-based actions, including:

- Characterization and monitoring
- Projects of expected levels of contamination after treatment
- Potential plume migration
- Reasonable maximum exposure scenarios



Tier 3 focuses completely on the site-specific conditions. For example:

- Fate and transport phenomena
- Descriptions of the range of possible exposures/risks
- Site specific risk assessment models may be developed
- Due to the costs involved, this analysis is suited to only large sites



EPA Brownfields Resources

Guidance is provided in these EPA resources:

- [General Guidelines on All Appropriate Inquiries](#) (due diligence process)
- [Fact Sheet on EPA Brownfields Grants, CERCLA Liability and All Appropriate Inquiries, April 2009 \(PDF\)](#)
- [All Appropriate Inquiries Fact Sheet, April 2003](#)



Land Reuse and Community Health Monitoring



Community Health Monitoring (EPA, 2006, <https://www.epa.gov/sites/production/files/2015-09/documents/finalphandbifact.pdf>).

The [Brownfields Law](#) focuses on the health impacts of brownfields. It allows a local government to spend up to 10% of a brownfields grant for:

- “(i) monitoring the health of populations exposed to one or more hazardous substances from a brownfield site; and
- (ii) monitoring and enforcement of any institutional control used to prevent human exposure to any hazardous substance from a brownfield site.”



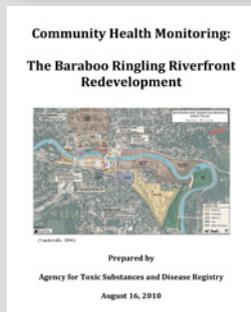
EPA and ATSDR Health Monitoring Resources:

For more information about Health Monitoring, visit the EPA Brownfields, Protecting Public Health webpage (<https://www.epa.gov/brownfields/brownfields-public-health-and-health-monitoring>).

You can also access these ATSDR website publications:



[An Indicator Framework to Measure Effects of Brownfields Redevelopment on Public Health \(Jul/Aug 2013\)](#)



[Community Health Monitoring: Baraboo Ringling Riverfront Development \(Aug 2010\)](#)



Additional Land Reuse Resources

- [Exposure Pathway Site Count Report](#)
Indicates at how many waste sites people were exposed to particular contaminants in the environment
- [Public Health Assessments](#)
ATSDR documents that evaluate the potential for contaminants in the environment at a site that might cause people to suffer adverse health effects.
- [Environmental Health WebMaps](#)
A geographic display of health information in context with environmental hazards, roads, political boundaries, schools, landmarks, and hazardous waste sites.
- Agency for Toxic Substances and Disease Registry (ATSDR)
www.atsdr.cdc.gov
- ATSDR National Land Reuse Health Program
www.atsdr.cdc.gov/sites/brownfields



- National Association of County and City Health Officials
www.naccho.org 
- National Environmental Health Association
www.neha.org 
- U.S. Environmental Protection Agency (EPA) Brownfields and Land Revitalization www.epa.gov/brownfields

If you need assistance in understanding concepts in this resource, please contact your State Health Department, your [ATSDR Regional Office](#), or send an email to atsdr.landreuse@cdc.gov.