# Land Reuse and Redevelopment Toolkit

## A **Municipal Agency's** Guide to Creating Healthfields

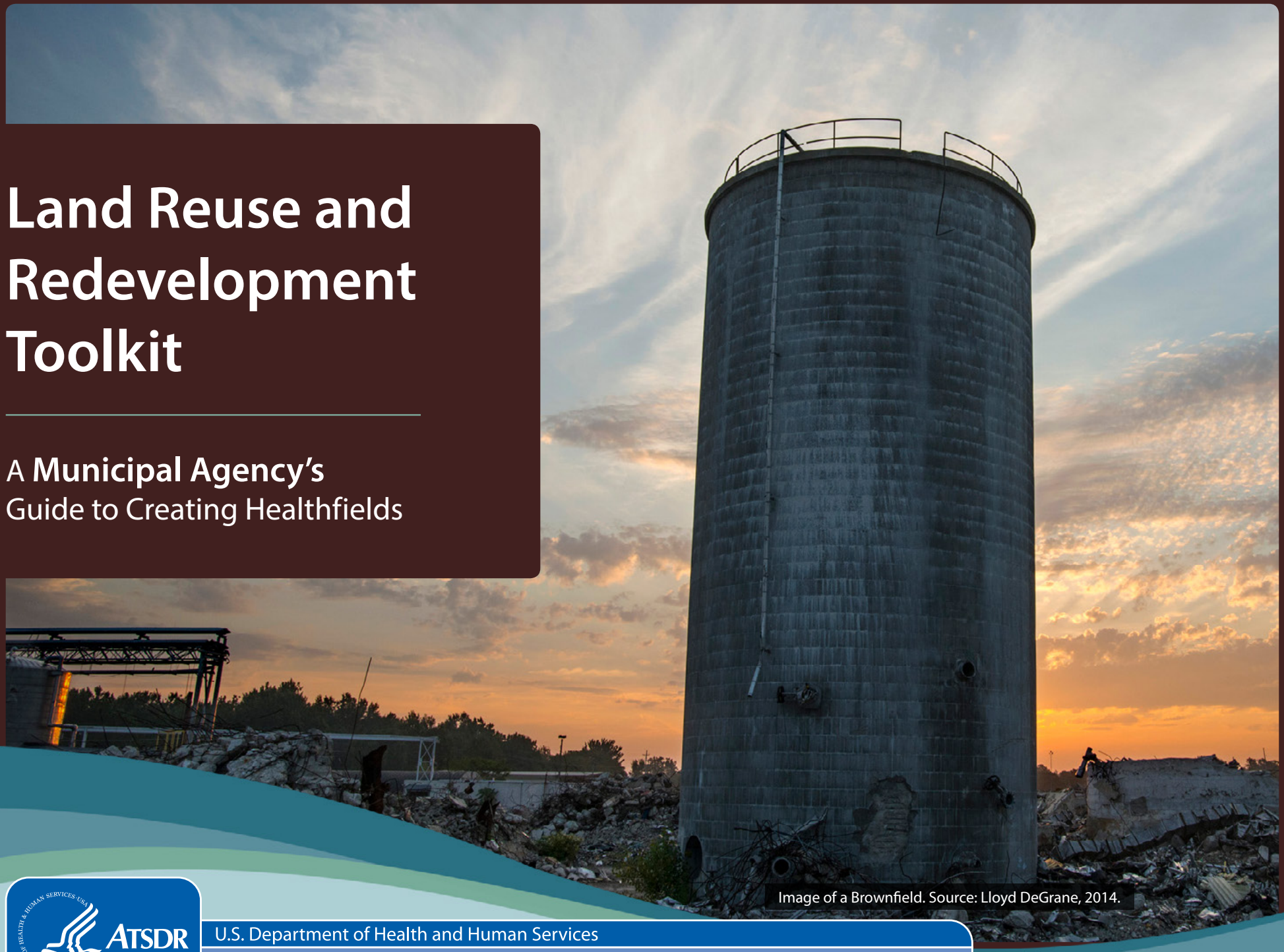

Image of a Brownfield. Source: Lloyd DeGrane, 2014.

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

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# Introduction

Image of a Brownfield. Source: Lloyd DeGrane, 2014.

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## This Toolkit's Purpose

The *Land Reuse & Redevelopment Toolkit* provides provides a Municipal Agency with the information, procedures, and resources needed to identify, cleanup, and redevelop Land Reuse Sites to positively impact a community's overall health. Let's start with the basics.

## The Basics

**Land Reuse Sites** are sites that are slated for redevelopment but may have chemical contamination. Land Reuse Sites include **Brownfields**, as well as other types of hazardous or potentially hazardous sites, such as landfills or Superfund sites. In essence, they are potentially contaminated sites that may be abandoned or underused industrial, commercial, or residential properties. A variety of Land Reuse Sites exist in the United States, including Brownfields.[1]

**Brownfields** are defined by the United States Congress through a 2002 amendment to CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) as 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. There are some exclusions to the definition of "Brownfield site," including facilities that are listed or may be placed on the National Priorities List, or are subject to corrective action under the Solid Waste Disposal Act.

The Environmental Protection Agency (EPA) estimates that there are **more than 450,000 Brownfield sites in the United States making them the most common** type of Land Reuse Site.[2] As foreclosures and manufacturing downturns increase, so may the number of Brownfields.

There are other types of sites that qualify as Land Reuse Sites.

**Federal facilities** include lands and improvements to lands, such as buildings, structures, and equipment owned by or leased to the federal government. Some of these sites may be contaminated. Federal facilities must comply with environmental regulations.[3]

**Resource Conservation and Recovery Act (RCRA) Regulated Sites** are regulated for the management of solid waste (e.g., construction debris or garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals. Past and present activities at RCRA sites sometimes have resulted in the release of hazardous waste and hazardous substances into soil, groundwater, surface water, sediments, and air. The RCRA requires investigation and cleanup of these hazardous releases.[3]

**Superfund Sites** are uncontrolled sites or abandoned places that contain hazardous waste and potentially affect local ecosystems or populations. These sites may be noted on the government's National Priorities List.[3]

**Underground Storage Tanks** refer to any underground storage tank and underground piping connected to the tank that has at least 10% of its combined volume underground. The EPA regulates tanks that contain petroleum or any hazardous substances.[3]

**Landfills** are sites that can receive solid waste from municipalities, industrial facilities, construction activities, and medical facilities. Landfills must be designed to comply with federal regulations to protect the environment from contaminants that may be present in the waste stream.[4]

## The Risks and Dangers of Land Reuse Sites

Land Reuse Sites can harm you and your community's health in many ways. The dangers include poor air quality, increased risk of disease, limited access to healthy foods, a lack of options for physical activity, poor housing quality, and environmental damage leading to toxic water. However, a process has been established to redevelop these sites into healthier and safer environments, which are referred to as "Healthfields." In addition to providing health benefits, the redevelopment of Land Reuse Sites can stimulate the local economy by bringing in new businesses and creating jobs.

Miles Ballogg, a member of the Brownfields & Reuse Opportunity Working Network (BROWN), is one of the original supporters of the "Brownfields to Healthfields" concept. Ballogg has promoted and helped to develop Healthfields throughout his home state of Florida.[5]

**Healthfields** are redevelopment projects that address community needs such as access to healthcare, fresh food, community centers, and parks.

Image of a Brownfield.
Source: GettyImages, 2017.

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## Redevelopment Benefits

Cleaning up and investing in Land Reuse Sites:

**P**rotects the health of communities
**R**emoves development pressures off undeveloped land
**O**ptimizes the use/reuse of existing infrastructure
**F**acilitates job growth
**I**ncreases local tax bases
**T**ransforms environments into healthy and safe places

## Who We Are

The **Agency for Toxic Substances and Disease Registry** (ATSDR) is a federal public health agency headquartered in Atlanta, Georgia. ATSDR is responsible for evaluating and protecting community health by preventing effects from harmful exposures and diseases related to toxic substances.

We emphasize the importance of community involvement throughout the redevelopment process. This requires earnest, respectful, and continued attention. To successfully create a collaborative environment, it's important to establish clear expectations, communicate effectively and always put your community first. Community health considerations are a crucial part of ATSDR's land revitalization activities, which strive to:

- Encourage early community involvement in decision-making
- Improve ways to talk about health and environmental risks
- Promote relationships among, agencies, partners, and communities
- Promote a well-rounded, health-focused approach to redevelopment
- Restore and revitalize communities in a way that is fair to all community groups
- Measure and evaluate changes in community health

Image of a Brownfield. Source: Lloyd DeGrane, 2014.

# Do You Work for a Municipal Agency?

This toolkit is designed for people who are working for a local municipality and are taking proactive steps to redevelop a Land Reuse Site into a Healthfield. A **Municipal Agency Employee** is a person who works at a local municipality and commits time, resources and plans to developing a Land Reuse Site. They are responsible for providing public input and assisting in the areas where public municipalities are strongest, like funding, project coordination, and communications support.

- Do you work for a municipality that is investing resources into community development?
- Have you identified one or more Land Reuse Sites to which your local agency is dedicating resources?
- Do you care about your community and try to be a good leader?
- Would you like to improve your ability to communicate complex changes in a simple way to your community members?
- Is your Municipal Agency looking at ways to decrease health disparities within your municipality?

If you identify with one or more of these questions, you can use this toolkit throughout all phases of your Land Reuse Site redevelopment project.

*Image of Mike Palm, Mayor.*
*Source: City of Baraboo, undated.*

**Mike Palm**
Mayor of Baraboo, WI

"The health benefits of cleaning up a Brownfield are automatic, and by redeveloping a site like this, the community just feels better about itself."

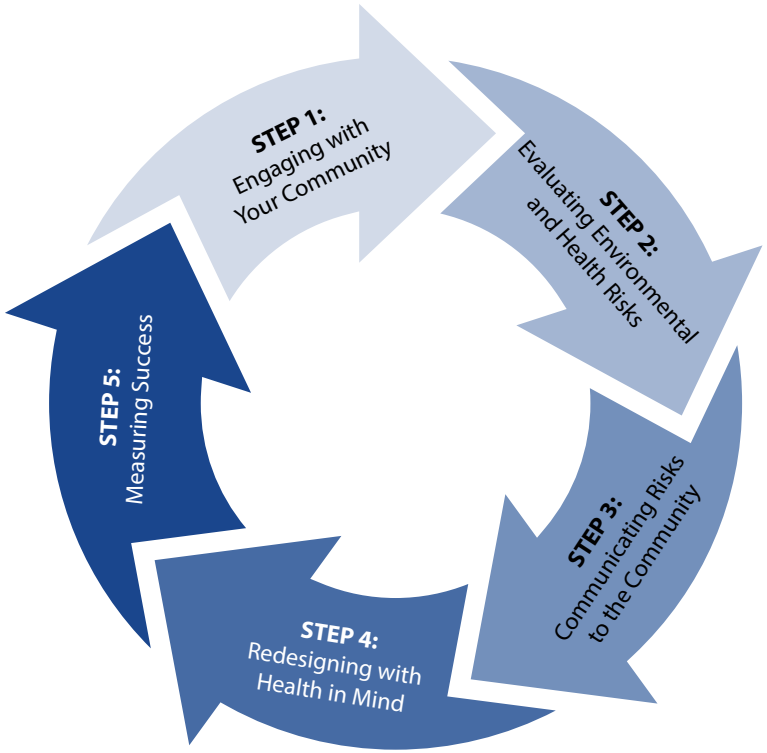
*Image of Ed Johnson, Manager.*
*Source: City of Tampa, undated.*

**Ed Johnson**
City of Tampa, Urban Development Manager for East Tampa, FL

"We started with Brownfields funding and ended with the creation of the Tampa Family Health Center. As a direct result, the surrounding areas have enjoyed renewed economic investment and increased employment opportunities. In addition, property values have increased 8%."

## Understanding How You'll Work within the 5-Step Land Reuse Model

The structure of this toolkit follows the comprehensive **ASTDR 5-Step Land Reuse Model** used by communities to transform potentially contaminated sites. As a Municipal Agency, you play a critical role in many of these steps.



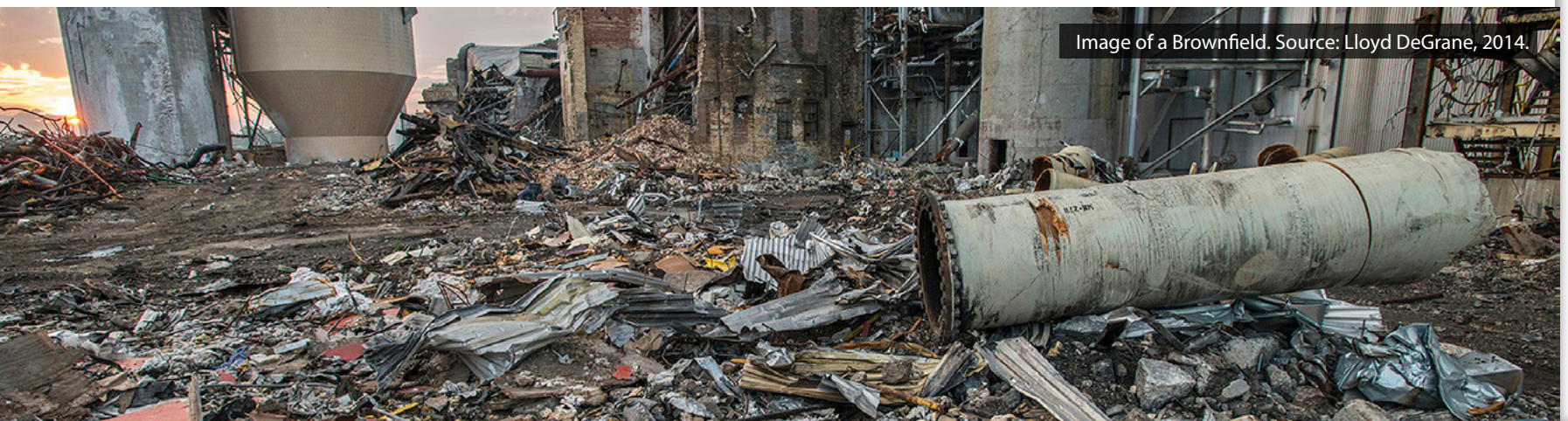



Image of a Brownfield. Source: Lloyd DeGrane, 2014.

# ATSDR 5-Step Land Reuse Model

### Step 1: Engaging with Your Community

First, get your community's support to address a Land Reuse Site. Then, come together to establish a community vision, address your community needs, and define how you will spread information throughout the project. Make sure to create a broad "Development Community" – residents, nonprofits, Environmental or Health Professionals, and anyone who shares a vision for a cleaner environment and improved health.

### Step 2: Evaluating Environmental and Health Risks

A qualified Environmental or Health Professional will conduct an Environmental Site Assessment (ESA) to determine what, if any, contaminants and liabilities are associated with the Land Reuse Site. An ESA typically has one or two phases:

- For an ESA I, the professional collects basic information — including inspecting the site, interviewing former owners, and reviewing local records.
- If there are concerns about possible contamination, an ESA II might be necessary. This means collecting and analyzing environmental samples (such as soil or water) to determine exact contaminant levels at, or from, the site. Environmental or Health Professionals can review those contaminants to determine possible harmful exposures and recommend protective actions.
- *NOTE:* ESA I or II is often referred to as a Phase 1 or Phase 2 Site Assessment.

### Step 3: Communicating Environmental or Health Risks

After the ESA report is finalized, you can help communicate the findings to your community. You can call on the environmental health professionals in your Development Community to translate the technical findings of the ESA report into easy-to-understand language. They may even meet with the community to explain any environmental and health impacts.

### Step 4: Redesigning with Health in Mind

Once the community understands the ESA findings, you can discuss site cleanup and reassess the vision before you begin redevelopment. For example, the end result of a Healthfield redevelopment could include housing, produce markets, community gardens, health clinics, or parks.

### Step 5: Measuring Success

It is important to measure and communicate any successes of the project to your community throughout redevelopment. Even small milestones show the community that the site is progressing in the right direction.

Keep reading to learn about each step of the Land Reuse Model and expected activities.

# Step One

## Engaging with Your Community

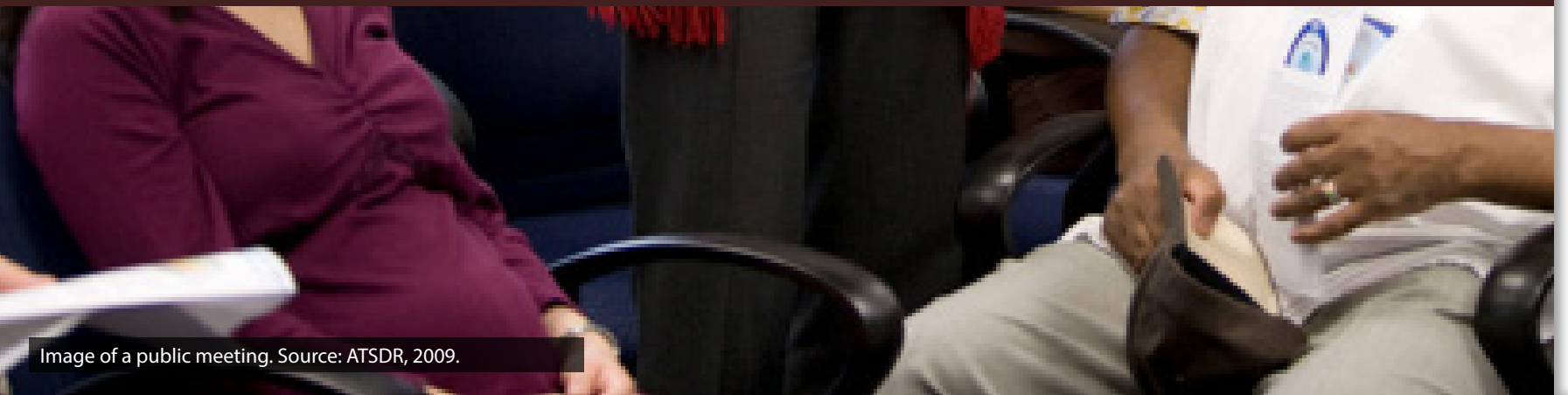


Image of a public meeting. Source: ATSDR, 2009.

## Where to Start

Your municipality can begin redevelopment on a Land Reuse Site by establishing a primary point of contact within your agency. This person will help facilitate the project timeline, budget allocation, logistics, and coordination. If your municipality cannot dedicate a person to the project full-time, it is helpful to recruit a person with similar community development experience to allocate some of their time to the redevelopment.

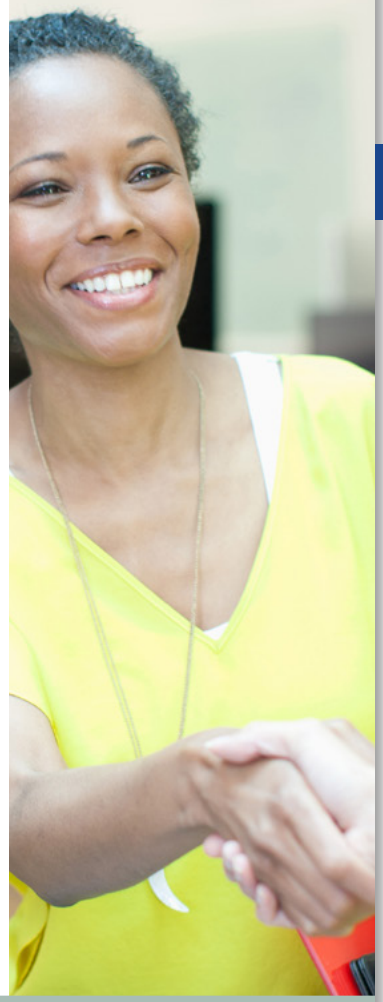
## Understanding who Lives Near the Site in Question

If you have identified a Land Reuse Site, it's important to begin with a proximity analysis. This analysis should identify individuals who live near the site in question and what, if any, negative effects they feel as a result of their proximity. It's especially important to understand who is at increased risk from exposure to toxic agents, often referred to as the **sensitive or special populations**, people who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.[6] Sometimes, low income communities or communities of color are disproportionally impacted by Land Reuse Sites.

## Developing Relationships and Engaging Stakeholders

In order to build a Healthfield, it is critical that you engage with your community to establish their needs and vision. Begin by identifying individuals in the community who are passionate about and actively driving for change. These people are called Community Champions, and they can both catalyze the project and help spread information. By identifying Community Champions, community organizations, and local or state environmental and health agencies who can all potentially contribute to the project, you will create your "Development Community" — those with a shared vision for redevelopment.

Beginning initial conversations with the community. Source: Getty Images, 2017.



**Toxic agents** are chemical or physical agents that, under certain circumstances of exposure, can harm humans, animals, or other living organisms.

## Identifying Community Needs and Creating a Unified Vision

It can be difficult to identify and understand all of your community's potential needs or visions, and even more challenging to get them to align on a unified goal. Nevertheless, establishing a unified community vision is essential to a successful land reuse and redevelopment project. It's also important to consider long-term sustainability. And because long-term sustainability typically involves discussing complex issues, it can be daunting for any community or municipality to tackle.

These questions are great thought-starters, but also provide guidance to keep the community and facilitators grounded throughout the process.

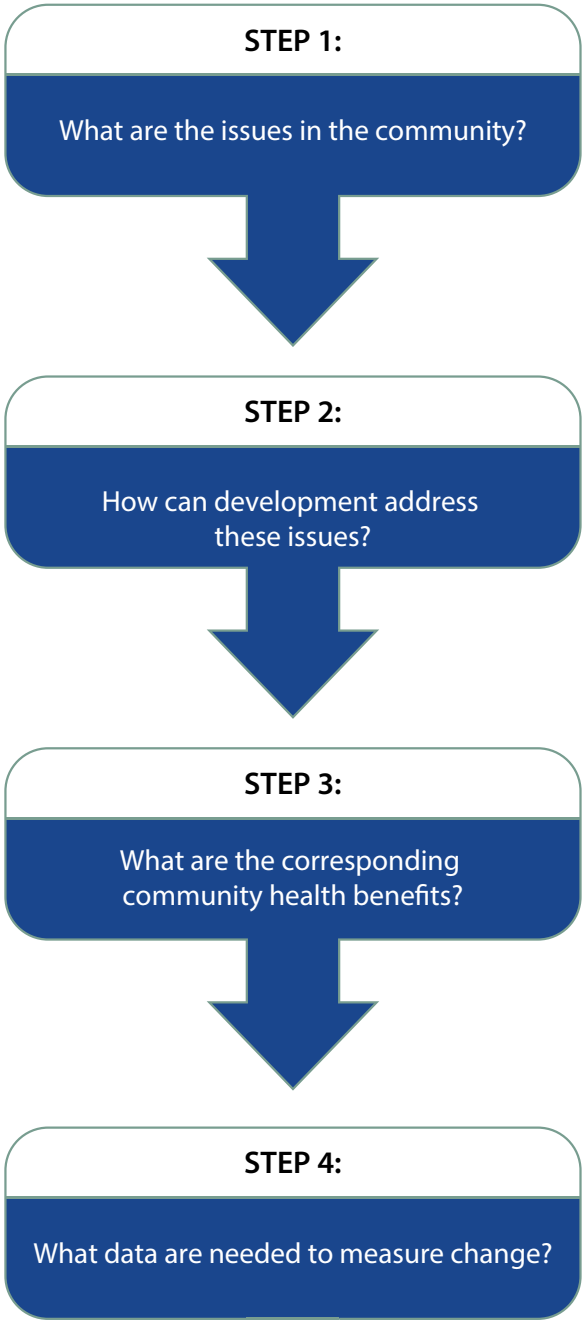
1. How do we create an inclusive process?
2. How can we set a guiding vision for sustainability for our community?
3. How do we measure progress toward that vision?

The following resources provide great approaches and questions to facilitate these conversations.

## The ATSDR Action Model Toolkit

The ATSDR Action Model Toolkit helps the wide range of members of the Development Community find ways to integrate health into the redevelopment. In addition to municipal agencies, health and Environmental or Health Professionals, and planners and developers, the community can also use the Action Model to identify common goals or visions and ensure they're incorporated in strategic planning.

The Action Model consists of four steps, using questions to help identify community needs and empower groups to align on unified visions and goals.



## Understanding How You'll Work Within a 5-Step Land Reuse Model

It's important to understand the process of redeveloping a Land Reuse Site holistically. The following chart details the primary types of personnel you can expect to work with during each stage of the project.

| Roles | Who are they? | What's their role? | Who do they work with? | What key steps are they involved in? |
|---|---|---|---|---|
| **Community Champion** | A person living in the community who is passionate about his or her community's health. | • Activate the community to make them aware of the site.<br>• Convey all potential risks to the Community and convice them to invest time and resources into redevelopment.<br>• Share all relevant information with the community. | • Community Planners<br>• Municipal Agencies<br>• Environmental or Health Professionals | • Engages the Community<br>• Communicates Risks<br>• Measures Success |
| **Community Planner** | A person who plans the logistics of a redevelopment project. | • Engage community members to understand their needs for redevelopment.<br>• Create project plans to ensure site assessment, remediation, and redevelopment are on time and on budget. | The Community Planner works with **everyone** in the process. | Involved at **all** steps |
| **Municipal Agency** | A person who works for a local municipality. | • Bridge the capabilities of local, state, and/or federal government to the community project.<br>• Provide network of resources, including community outreach, grant writing, staffing, etc. | The Municipal Agency works with **everyone** in the process. | Involved at **all** steps |
| **Environmental or Health Professional** | A person who is qualified to provide environmental and health services for a community. | • Conduct site assessment.<br>• Conduct environmental cleanup of site.<br>• Conduct community health analysis. | • Community Planners<br>• Municipal Agency | • Evaluates the Environmental and Health Risks<br>• Communicates the Risks |
| **Developer** | A person in charge of the development aspects of the project. | • Provide practical redevelopment options that address community needs.<br>• Execute the redevelopment of land into functioning real estate. | • Community Planners<br>• Municipal Agency | Involved at **all** steps but their primary role is redesign. |

# Key Roles Within the Model

| Step | Roles | Activities |
|---|---|---|
| **Step 1:** Engaging with Your Community |  | Work with the **Community Champion** to engage and activate the community towards a unified vision for healthy land reuse. |
| |  | Work with the **Community Planner** to understand the community's health needs and develop options for healthy land reuse. |
| **Step 2:** Evaluating Environmental and Health Risks |  | Coordinate a site assessment and community health analysis by working with your **Environmental or Health Professional** who is conducting the site assessment and identifying contamination. |
| **Step 3:** Communicating Environmental and Health Risks |  | Work with the **Environmental or Health Professional** to translate the results into plain language so the community understands the risks. |
| |  | Work with your **Community Planner** and **Community Champion** to share the results of the site assessment with the community. |
| **Step 4:** Redesigning with Health in Mind |  | Work with the **Community Champion** to share the community's health needs and vision with the **Developer** and assist in project planning for cleanup and redesign while adhering to compliance and regulatory mandates. |
| |  | Assist in the planning of an environmental cleanup with an **Environmental or Health Professional**. |
| **Step 5:** Measuring Success |  | Work with the **Environmental or Health Professional** to quantify the health benefits from the healthy land reuse. |

## Get Started Now

If you and your Community Champions are ready to begin engaging the community, contact ATSDR at:

 www.atsdr.cdc.gov/sites/brownfields

 ATSDR.LandReuse@cdc.gov

# Step Two

## Evaluating Environmental and Health Risks

Conducting site assessment. Source: Getty Images, 2017.

## Understanding a Site Assessment

Before the redevelopment of Land Reuse Sites, your site(s) may need an Environmental Site Assessment to determine the health risks associated with exposure to potential contamination to protect the health of people who live near or access the Land Reuse Sites.

An **Environmental Site Assessment** (ESA) is the process of identifying the presence or likely presence of hazardous materials on a property. This could include identifying a release or threatened release of hazardous materials into structures on the property, into air, or into soil and groundwater or surface water on or near the property.

The two primary phases of the ESA process are designed to increase the level of understanding of the site condition.

1. ESA Phase I is sometimes referred to as "due diligence" or "all appropriate inquiry." It identifies potential environmental concerns by conducting:
   - Historic record searches
   - Interviews with property owners
   - Reviews of local, state, and federal databases
   - A site visit
2. ESA Phase II identifies actual contaminants through laboratory testing of samples, including:
   - Soil samples
   - Groundwater samples
   - Ambient air samples
   - Asbestos-containing material
   - Lead-based paint samples

Understanding the ESA reports can be difficult. The reports are very technical in nature, and have the potential to return more than 250 toxicological results – or environmental contaminations – between ESA I and II. Because this phase of the redevelopment process is technical, it's important to consult your Environmental or Health Professional for clarity. For additional information, please refer to pages 22 - 25 of the Environmental or Health Professional Toolkit.

The Environmental Protection Agency (EPA) has established standards for conducting all appropriate inquiry— the requirements for assessing the environmental conditions of a property prior to its acquisition. For properties purchased after May 31, 1997, the law requires the use of procedures developed by the American Society for Testing Materials (ASTM), as they meet the "all appropriate inquiry" requirement for site characterizations and assessments.[7] **The American Society for Testing and Materials** (ASTM) International is a worldwide standards organization, which has strict guidelines for both ESA I and II.

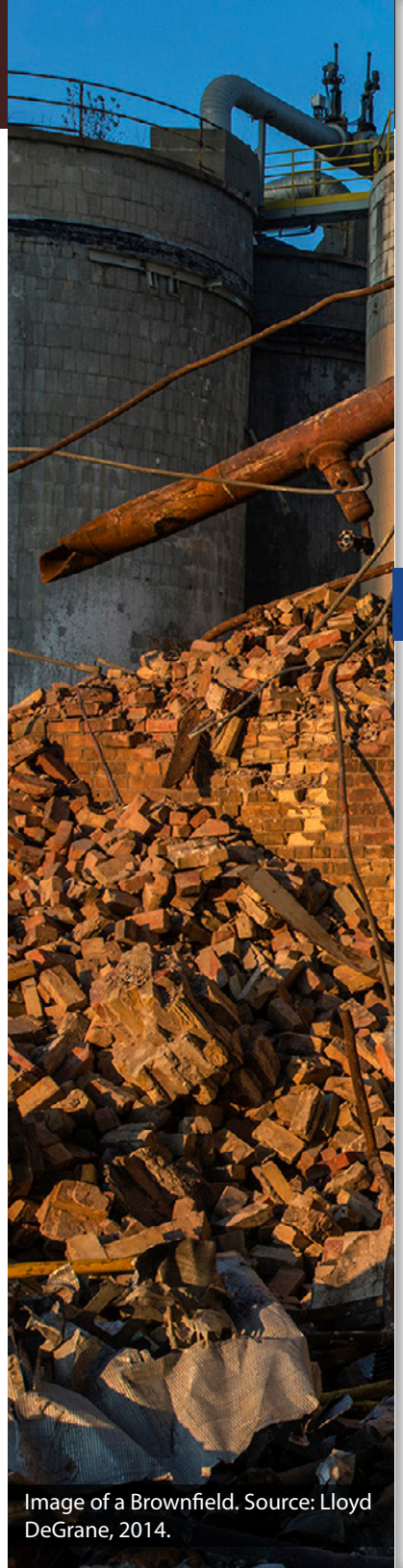


Image of a Brownfield. Source: Lloyd DeGrane, 2014.

## Assessing Potential Contamination – Public Health Assessment

If a Land Reuse Site has been evaluated for contamination, either through an ESA II or by a state or federal regulatory agency, your community members may have concerns about exposure to contamination. Through the ATSDR Partnership to Promote Local Efforts to Reduce Environmental Exposure (APPLETREE), ATSDR can fund a variety of state, county, city/township, special district, and tribal governments or organizations to conduct activities at Land Reuse Sites. In 2017, for example, ATSDR funded 25 State Health Agencies to investigate and respond to harmful exposures in communities and educate the public on exposure protection.

During the health assessment process, either ATSDR or an APPLETREE partner may review environmental data to determine potential adverse health effects on people who may live near or access a Land Reuse Site. Often, your state health partners can provide a rapid, shorter assessment which can alleviate concerns you or your Development Community may have. ATSDR has more information available about obtaining a Public Health Assessment.

## Free Technical Assistance

Several organizations offer free technical assistance to communities and other stakeholders conducting a Land Reuse Site redevelopment. Examples include ATSDR and the EPA-funded Technical Assistance to Brownfields (TAB) programs. There are three TAB centers, each of which serves several states:

- Kansas State University's TAB Program
- New Jersey Institute of Technology's (NJIT) TAB Program
- Center for Creative Land Recycling resources

Once you understand all potential risks, you can clearly communicate them to your community. You've most likely already established several lines of communication, but make sure to **convey these findings on a platform that supports a two-way conversation**. Bring in Environmental or Health Professionals from your Development Community to help you discuss risks with your community.

Image of a Brownfield. Source: Lloyd DeGrane, 2014.

**ATSDR** and partners have completed over 2700 health assessments at Land Reuse Sites across the country, of which 274 were Brownfields. ATSDR discovered health hazards at 42% of these Brownfields sites.[8]

## Allocating Public Funds to Conduct ESA Phase I and II

A developer may take on the responsibility of cleaning up and redeveloping a site. In some instances, a state environmental agency may help with initial site assessment or remediation advice. Many communities may need to hire an Environmental or Health Professional to execute a site assessment. However, federal and state grants are available to help fund these projects. The EPA offers assessment grants up to $200,000, which could fund the full site assessment process.

The costs of ESA Phase I and II site assessments vary and can be estimated based on Internet searches. Typically, these costs will be linked to private companies that do site assessment work. An ESA Phase II is only required if "Recognized Environmental Conditions" appear in the ESA I report, which require further investigation.

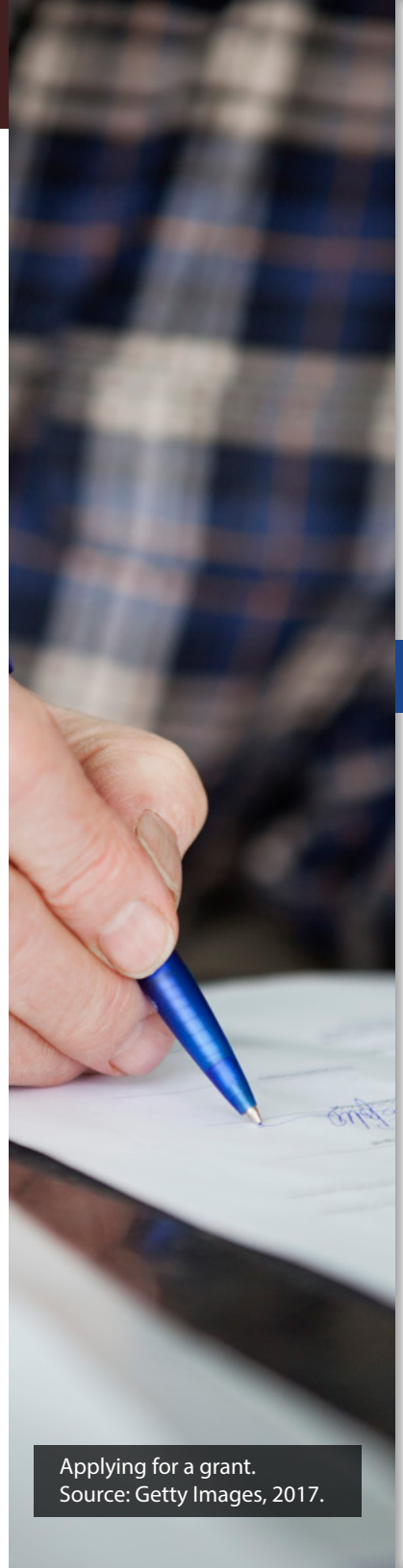
A few ways to **obtain funding** for this process include:

- Applying for a grant
- Requesting funds from your state agency
- Asking your state if they can perform a free ESA
- Setting up a crowdfunding campaign for donations (e.g. Kickstarter, GoFundMe)

## Funding Vehicles

It's no secret that money is the most crucial resource of all. Without funding for the actual redevelopment, it's nearly impossible to execute these projects. Therefore, **it's critical to understand the grants that might be available** to you. You can also learn about compelling grantwriting. Here are some good resources for getting started:

- Learn about site eligibility for funding opportunities from the Environmental Protection Agency (EPA) for assessment, cleanup, and other redevelopment activities.
- While not currently an actively funded program, ATSDR highlights their past funding opportunities for health education, community engagement, and planning, specific to Brownfield or Land Reuse Site development. The information and summaries of these projects may provide guidance for other communities.
- A much more robust resource, Grants.gov can help you learn about and search for grants and apply on their site.
- The University of North Carolina's Environmental Finance Center provides a great tool for grant writing tips and obtaining grants, featuring Grants.gov too.
- Finally, eCivis has worked with various states and major cities across the country on best practices to be "grant-ready".



Applying for a grant.
Source: Getty Images, 2017.

## The Risks

Contaminated Land Reuse Sites can pose a direct threat to public health. The dangers include poor air quality, increased risk of disease, limited access to healthy foods, a lack of options for physical activity, poor housing quality, and environmental damage leading to toxic water, soil, air, or land. When these sites present physical hazards and toxic pathways to airways and waterways, they can become extremely dangerous for children or other sensitive communities. Investing in these sites can simultaneously address public safety and public health needs.

## Understanding Determinants of Community Health

At first, you must understand the basic health profile of your community. The determinants that comprise this profile include:

- Income and social status
- Social support networks
- Education
- Employment/working conditions
- Social environments
- Physical environments
- Personal health practices
- Coping skills
- Healthy child development
- Gender
- Culture

All of these factors may need to be considered when you evaluate the health of your community and begin to communicate it to your members.

## Understanding Community Health Assessments

There are several frameworks you and your community may use for a community health assessment. Here are three commonly used methods:

- The aforementioned **ATSDR Action Model**
- **Health Impact Assessment**
- **Protocol for Assessing Community Excellence in Environmental Health**

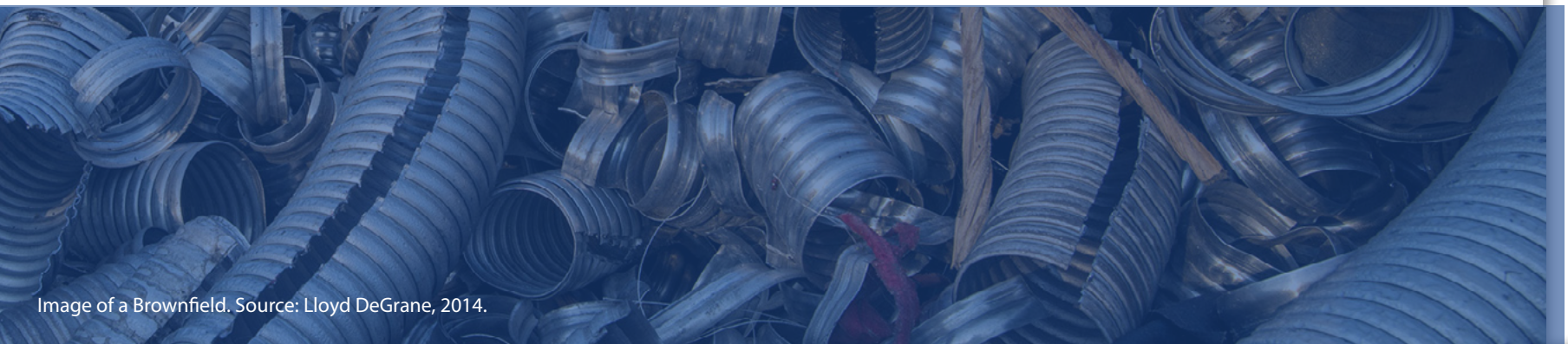


Image of a Brownfield. Source: Lloyd DeGrane, 2014.

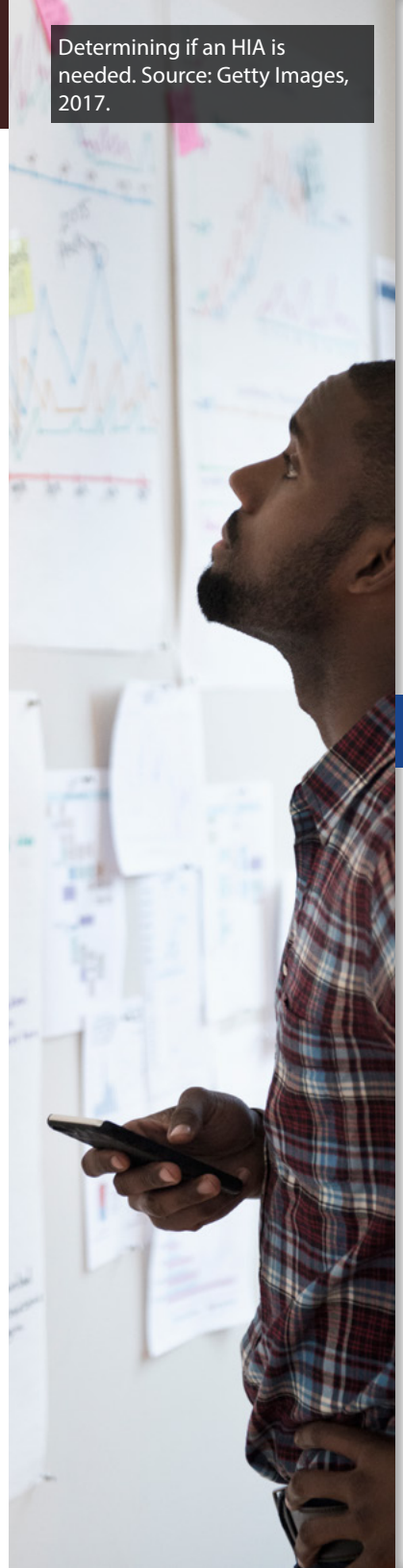
# Evaluating the Risks

The **Health Impact Assessment** (HIA) can help you understand how a Land Reuse Site redevelopment plan can affect your community's health, as well as what options are most effective when evaluating proposals for a new health initiative. An HIA uses scientific data, professional expertise, and stakeholder input to identify and evaluate the public health consequences of proposals **before** they are implemented. It also suggests actions that can minimize adverse health impacts and bolster beneficial health impacts. An HIA consists of six steps:

1. **Screening** – Determines the need and value of an HIA
2. **Scoping** – Determines which health impacts to evaluate, the methods for analysis, and the work plan for completing the assessment
3. **Assessment** – Develops a health profile of the community, including baseline conditions for various health conditions, literature reviews, and quantitative methods to assess likely effects of the proposed project
4. **Recommendations** – Provides strategies to manage identified adverse health impacts
5. **Reporting** – Develops the HIA report and communicates findings and recommendations
6. **Monitoring** – Tracks impacts of the HIA on decision-making processes and the decision, as well as impacts of the decision on health determinants

The **Protocol for Assessing Community Excellence in Environmental Health** (PACE EH) was developed by the CDC's National Center for Environmental Health and the National Association for County and City Health Officials to provide guidelines for local health officials. This methodology guides communities and local health officials in conducting community-centered environmental health assessments, by relying on community collaboration to involve stakeholders in:

- Identifying local environmental health issues
- Setting priorities for action
- Targeting populations most at risk
- Addressing identified issues



Determining if an HIA is needed. Source: Getty Images, 2017.

## From Risks to Reward

Each site has unique challenges, contaminants, and liabilities. The following examples illustrate some specific site risks — and how the communities overcame them.[9]

In Kenosha, Wisconsin, a 29-acre piece of land was once home to America's largest brass company. Once closed, it left a multitude of environmental contaminants, including polychlorinated biphenyls (PCBs), metals, and oil in the soil. The land was cleaned up and successfully **redeveloped into an affordable housing neighborhood** with a grocery store and a new school.

In Jefferson County, Alabama, Five Mile Creek was a source of coal mining and steel manufacturing. By the early 20th century, acid mine drainage and other industrial contaminants had made Five Mile Creek—dubbed "Creosote Creek" because of its chemical odor and slick sheen—one of the most polluted waterways in Alabama. The waterway was broken into different sections and evaluated for each contaminant present. It was then cleaned up, and **the area was turned into public parks, sidewalks, and open space to promote physical activity** in the region.

In Boise, Idaho, an abandoned church had become a haven for methamphetamine (meth) use and production. Further, the church was found to be contaminated with toxic materials—lead paint, methamphetamine, and suspected asbestos. Cleanup and redevelopment **turned the church into a hub for children's learning**, well-being, and artistic growth.

These stories are proof that you and your community can create anything with the right resources and motivation.

## Get Started Now

Want to obtain your ESA or have questions about the process? Are you concerned about a potentially contaminated or hazardous site and threats to your community's health? Contact ATSDR to learn how Environmental or Health Professionals can assist.

www.atsdr.cdc.gov/sites/brownfields

ATSDR.LandReuse@cdc.gov

# Step Three

## Communicating Environmental and Health Risks

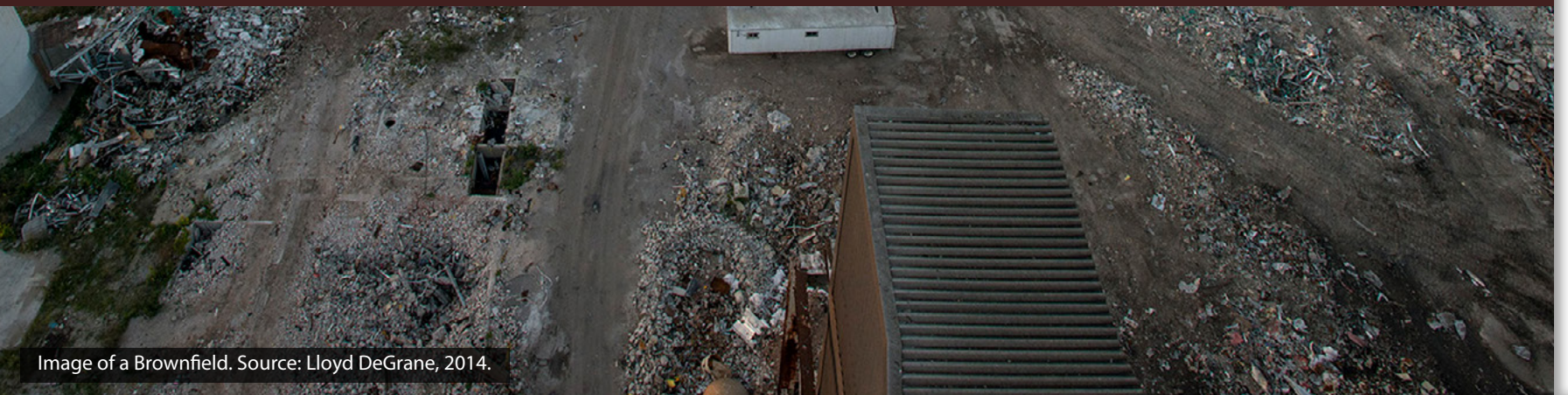


Image of a Brownfield. Source: Lloyd DeGrane, 2014.

## Supporting Communication of Reports

After a successful ESA or Community Health Assessment has been conducted, the findings will inform your evaluation of the environmental and health risks — which you may need to communicate to all community stakeholders. ESA and community health assessment reports are robust and complex. Simplify your message to the general community so they can understand the full risks and findings. Translating and synthesizing the documents into plain language will help your message reach the community.

Convey this information on a platform that supports a two-way conversation. People will have questions and concerns about the redevelopment. Ensure this conversation is an open forum, rather than a presentation. During this step, you can rely on your Environmental or Health Professional and Community Champion to accurately address the community and build trust.

The EPA provides some best practices when talking to people about risk.

**Risk communication** is the process of informing people about potential hazards to their person, property, or community.[9]

The EPA originally developed the **Seven Cardinal Rules of Risk Communication** in 1988, which has been adapted and updated to evolve with our times. However, the rules themselves are the same; they, along with the support of your Environmental or Health Professionals, will help you communicate any risks your community may face.

1. Accept and involve the public as a legitimate partner.
2. Listen to the audience.
3. Be honest, frank, and open.
4. Coordinate and collaborate with other credible sources.
5. Meet the needs of the media.
6. Speak clearly and with compassion.
7. Plan carefully and evaluate performance.

The EPA can provide more information on risk communication along with best practices and strategies for communicating with your audience.

Conducting site assessment.
Source: Getty Images, 2017.

## Message Maps

The actual messages, whether written or verbal, should be structured in a way that resonates with your audience. The EPA suggests using a Message Map to assist with your communication. The following examples of message mapping and best practices draw on real-life examples from previous Brownfield redevelopment projects.

### Message Map Template

| Key Message | Key Message | Key Message |
|---|---|---|
| Supporting information 1-1 | Supporting information 2-1 | Supporting information 3-1 |
| Supporting information 1-2 | Supporting information 2-2 | Supporting information 3-2 |
| Supporting information 1-3 | Supporting information 2-3 | Supporting information 3-3 |

A **Message Map** is a detailed, visual description of organized answers to anticipated questions and concerns from key community stakeholders.

Explaining results to the community. Source: Getty Images, 2017.

## My School Daycare: Avoiding Arsenic Exposure

**Background:** Sinco, Inc., a former plastic safety net manufacturing facility, based in Connecticut, was redeveloped into a daycare center. The site's soil has historically contained high levels of arsenic, a naturally occurring element that is used primarily in wood preservation or pesticides, as well as other contaminants.

**Risk(s):** Although much of the site had been cleaned up, the soil in the playground was never sampled to determine whether it contained harmful levels of arsenic to children who attended the daycare.

**Outcome:** In February 2008, the Connecticut State Department of Public Health worked with the daycare property owner to successfully test the soil. It was determined that while the playground surface and subsurface soil was contaminated with arsenic, a remedial plan was possible to prevent exposure.

**Results:** The state worked with the property owner to ensure arsenic in the soil would be covered with wood chips to prevent exposure. The state developed a fact sheet and held a public meeting to address parent and community concerns. During the meeting, the state confirmed that children had likely not been exposed prior to the cleanup and were not at risk of direct contact in the future.

### Daycare Center Message Map

| | | |
|---|---|---|
| **Key Message**<br>Connecticut Department of Public Health has worked with the owner and operator to ensure arsenic in the soil will be covered with wood chips to prevent exposures | **Key Message**<br>Children attending the daycare will not have direct contact with the residual arsenic contamination in the soil | **Key Message**<br>Children were not likely exposed as the daycare center has been open less than a year and during winter children were not using the playground |
| **Supporting information 1-1**<br>Limited soil removal will take place in areas with highest arsenic levels | **Supporting information 2-1**<br>The playground has a layer of woodchips covering the soil | **Supporting information 3-1**<br>A child would need to play directly in the soil on a daily basis, for several years to be harmed by arsenic |
| **Supporting information 1-2**<br>Cleanup plan will likely include placing additional layers across the entire playground | **Supporting information 2-2** | **Supporting information 3-2** |
| **Supporting information 1-3**<br>After additional layers added, children will not be able to come into contact with the soil | **Supporting information 2-3**<br>One would need to play directly in the soil on a daily basis, for several years to be harmed by arsenic | **Supporting information 3-3** |

## ABC Asbestos Mine: Contaminated Streams and Potential Health Risks

**Background:** During most of the 1900s, a region in the U.S. was home to an active asbestos mine ("ABC Mine" for this case study). During operation, millions of tons of asbestos ore were excavated, generating tons of waste rock and mine tailings.

**Risk(s):** People skied and hiked on old asbestos mine tailing piles. Runoff from the site, white with asbestos fibers, entered a local stream — contaminating the water and sediments and extending downstream to wetland areas. Environmental health professionals were concerned about the presence of airborne asbestos fibers. If inhaled, the fibers can remain inside a person's lungs forever, causing lung disease, lung cancer, and in some cases, death.

**Outcome:** Environmental health professionals evaluated the site to determine the route, frequency, and duration of exposures for people who worked or recreated at the site. Based on these results, they recommended restricting access to the mine property, preventing the reuse of any of its materials, and prohibiting access to the affected downstream areas.

**Results:** Once access was restricted, federal and state agencies enacted a public awareness campaign to educate residents about asbestos and ways to minimize their exposure. Ultimately, the site was identified and acknowledged as a hazardous place where recreation can be dangerous to people's health.

### Asbestos Mine Message Map

| | | |
|---|---|---|
| **Key Message**<br>Being exposed to asbestos does not mean you will develop health problems | **Key Message**<br>Health status and behavior can exacerbate and accelerate exposure risk | **Key Message**<br>You can minimize your own exposure |
| **Supporting information 1-1**<br>Asbestos-related illness depends on duration and frequency of exposure | **Supporting information 2-1**<br>Cigarette smoking with asbestos exposure increases your chances of getting lung cancer | **Supporting information 3-1**<br>Stay off mine property |
| **Supporting information 1-2**<br>Asbestos-related illness depends on how much you were exposed to | **Supporting information 2-2** | **Supporting information 3-2**<br>Do not use wetlands up to a mile downstream for camping or other activities |
| **Supporting information 1-3**<br>Harm depends on size and type of asbestos you were exposed to | **Supporting information 2-3** | **Supporting information 3-3** |

ATSDR has communication and messaging information, as well as a message map template that can be used to structure your communication.

## Strategies for Social Media Communication Support

Social media is one of the most cost-effective and efficient ways to communicate with a large group of people. Below are some best practices to help you begin thinking of ways to integrate social media tools into your communication efforts.

Municipal Agencies can use social media to share information with community stakeholders and identify opportunities for redevelopment of Land Reuse Sites.

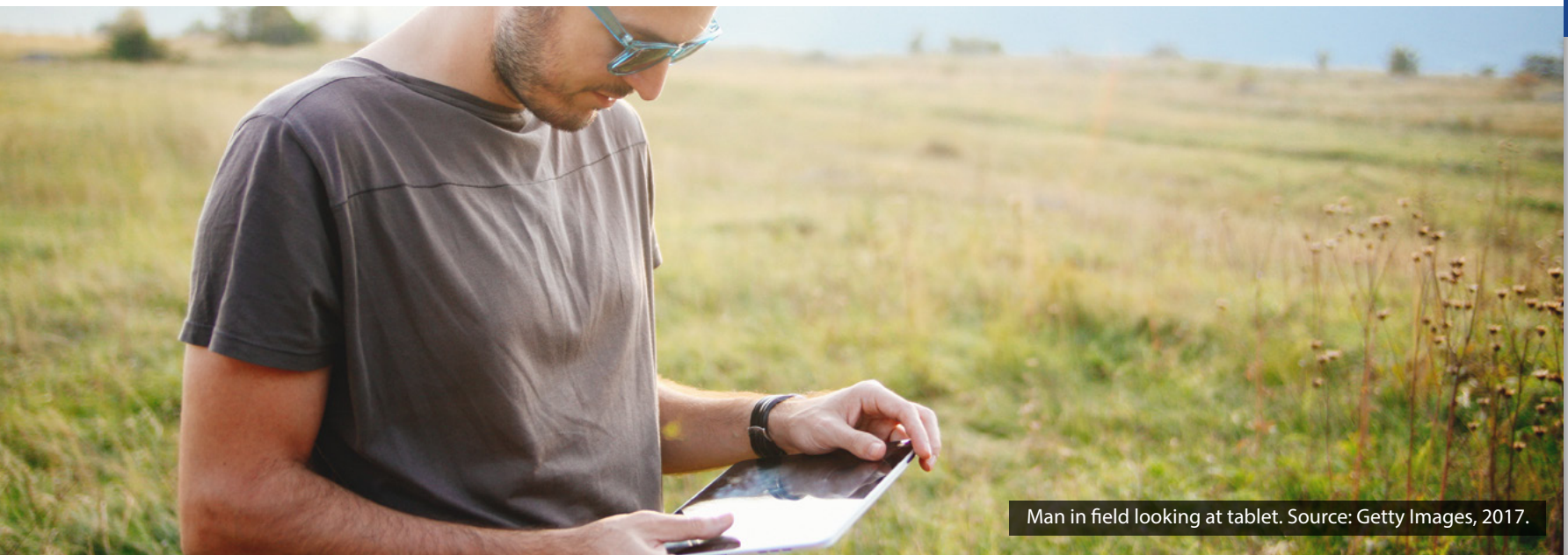
1. **'Social' isn't just a channel or a platform, it's a behavior.**

   Social media should not be viewed as solely a message dissemination vehicle. Rather, it's an environment where millions of people connect to contribute in virtual dialogue. This is why social media practitioners must listen as much as they speak. For example, you can use social media to:

   a. Engage with or start a conversation with stakeholders, potential partners, and job candidates
   b. Host a live video chat to have some "face time" with community members, answer their questions, and listen to their concerns
   c. Share a time-lapse video of redevelopment projects.

2. **If you can't measure something, it didn't happen.**

   It's essential to develop quality social media metrics. Those metrics should serve as Key Performance Indicators (KPIs), which comprise quantitative and qualitative data sets. The right metrics will help you determine if your social media efforts are reaching your intended audience — and whether your messages are translating into action. You can change your tactics as you go and refine your target audience.



Man in field looking at tablet. Source: Getty Images, 2017.

3. **Just because you CAN, doesn't mean you SHOULD.**

   Social media platforms (e.g. Twitter, Facebook, Instagram) are constantly evolving and providing users with new features to enhance the overall user experience. While some of these features appear to be new and exciting, you may not necessarily need to use them. Whenever possible, be sure that your social media work aligns itself with the purpose of each platform.

4. **If you want your audience to do something, just ask!**

   Having an explicit call to action may seem obvious, but it really does work! Here are a few examples:

   - Click here to see how funds are being allocated for Land Reuse Site redevelopment across the United States.
   - Like our page to receive updates on upcoming Land Reuse Sites.
   - Please share this post to spread awareness of the risk of asbestos inhalation near the Land Reuse Site.
   - Comment below if you would like more information on Land Reuse Site rehabilitation programs in your neighborhood.

5. **"If you build it, they will come" only works in movies.**

   If you want to generate interest, establish an audience, or increase perception about anything related to Land Reuse and redevelopment, you must do more than publish content to a channel. In short, if you plan, target, build, create, track, and optimize, they will come. But they will also stay and engage with your profile. Use social media platforms to:

   - Design a group or digital space, using paid targeting to reach community stakeholders and potential partners, facilitate open discussion, address concerns, or plan meetings.
   - Create Twitter polls to share data points or gain insight from community members on specific topics (e.g. knowledge of ESAs, how dollars are being spent, sentiment towards projects).

6. **Optimize your social media presence.**

   Humanization is key. Social media is about connecting with people and building trusting relationships. Use a high-quality, bright profile photo and create a bio that is inviting and informative, yet straight to the point.

## Get Started Now

Need to communicate environmental and health risk results, but not sure how to begin? ATSDR can help you identify resources and personnel.

www.atsdr.cdc.gov/sites/brownfields

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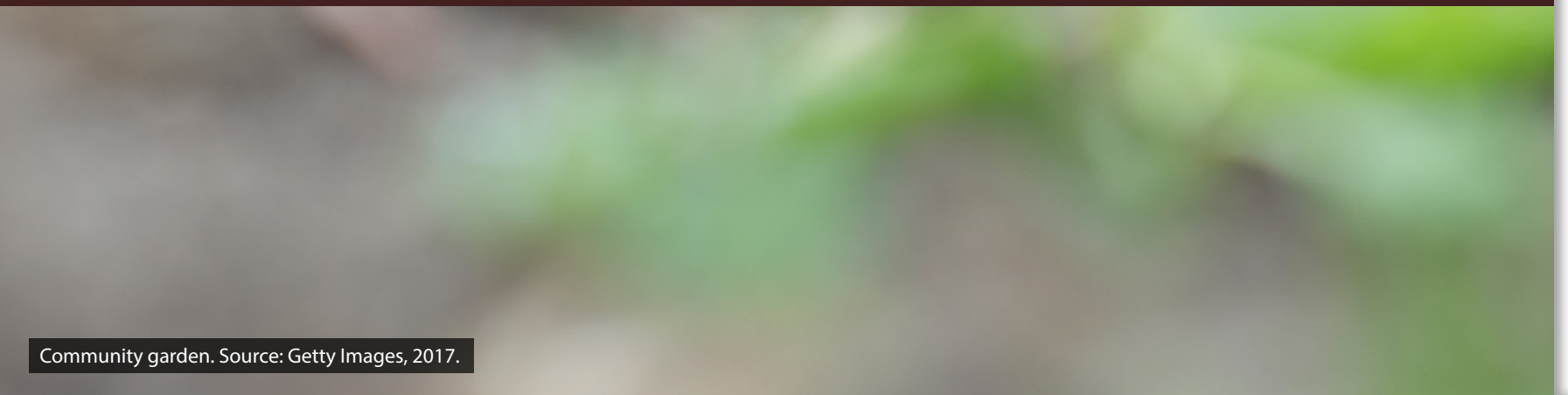
# Step Four

## Redesigning with Health in Mind



Community garden. Source: Getty Images, 2017.

## Executing a Project Plan to Administer Funds for Site Cleanup

After money has been allocated to the Land Reuse project, you can help coordinate site cleanup or a Land Reuse Site redevelopment. Identify the Environmental or Health Professionals and developers who can help cleanup and redevelop the site. It is important to:

- Define the key objectives of the redevelopment project
- Provide all background information about the site, including threats to public health, public safety, and the environment
- Establish the proposed action plan and the reasons for the specific course of action

Municipal employee engaging with their community. Source: Getty Images, 2017.

## Emphasizing Health with Redevelopment

The Land Reuse Site in your city can be transformed to benefit the health of your citizens. That's why it's important to establish a community vision at the start of the project in Step 1 (Engaging with Your Community). This vision may guide all the decisions for the future site. If the project lacks a vision for a healthier community, it may never happen. When developers and other groups pitch ideas to develop the land, they should **understand the community's needs and integrate them into the central design of the site**. If they fail to do this, consider finding other partners.


The U.S. Economic Development Administration (EDA) resource directory is a great tool, offering a reliable network to critical resources, from the local to regional level, identified by state.

Image of a Brownfield. Source: Lloyd DeGrane, 2014.

## Identifying and Developing Strategic Partnerships

One way to ensure a success is to identify and **work with strategic partners who can add business value or organizational value**. For example, a local business may want to expand into your community, or a local nonprofit might have values aligned with your project and desires to improve the health of the community. Some common strategic partnerships include hospitals, high schools, local merchants, local health departments, and recreational organizations and park districts.

Developing partnerships. Source: Getty Images, 2017.

## Get Started Now

Breaking ground on a site cleanup is a major milestone. If you're ready to begin, but still have questions, contact ATSDR to learn about your next steps.

www.atsdr.cdc.gov/sites/brownfields

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# Step Five

## Measuring Success

Reviewing project progress. Source: Getty Images, 2017.

## Communicating Small Wins

Land reuse and redevelopment projects can be daunting. They may take a long time, causing community members to lose hope if they can't see the light at the end of the tunnel. So it is critical to communicate even small victories, such as the opening of a new pocket park or obtaining a small grant. This gives the project momentum and reassures citizens that there has been progress. Social media is a great way to communicate these milestones.

At the beginning of the project, it is important to define some metrics so you can gauge your progress. With this data, you can prove quantitatively that your work has created real economic, health, and environmental impacts. The goal is to **connect your measurements to the issues and needs that your community has identified**.

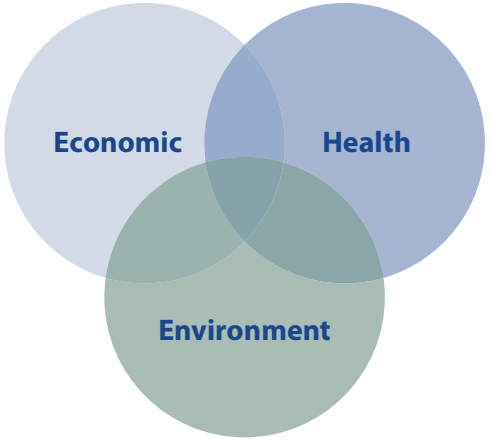
## Applying Metrics to Measure Outcomes (Quantitative)

There are three overarching categories you can measure during your redevelopment project:

**Economic:** Jobs created, sales and revenue generated, new business entities created

**Health:** Health monitoring data, public safety qualitative community surveys

**Environment:** Data about air & water quality to understand exposure pathways




The following are a few examples:

| Issue | Measurements |
|---|---|
| Community-wide employment and business issues | • Number of college-educated residents<br>• Workforce statistics<br>• Number of people shopping and dining |
| Access to recreation and amenities | • Trail expansion projects<br>• Number of citizens using recreational trails<br>• Number and usage of parks<br>• Amount of green space per person<br>• Number of grocery stores and medical clinics within walking distance of residential areas |
| Contaminated and blighted properties | • Site inventories<br>• Overview of contaminants at sites and associated health effects<br>• Site maps |

## Applying Methods to Measure Public Sentiment

Because you work for a publicly funded organization, you might want to assess the **Public Sentiment** of your project. You can do so by creating surveys, speaking at community gatherings, and leading focus groups with individuals who are involved with the project or live near the site in question. It is important to account for your community's thoughts, feelings, concerns, questions and input about the redevelopment project. A few ways to measure Public Sentiment include:

- Community Pride and Satisfaction surveys
- Odor surveys (if near a site, such as a waste transfer facility)
- Access to Healthy Food surveys
- Access to Open Space surveys (uncommon, but possible)

Municipal employee engaging with community about project progress. Source: Getty Images, 2017.

## Identifying Health Impacts and Outcomes

Because the purpose of this toolkit is to create positive health impacts in your community, the **success of the project depends on tracking and evaluating the community's overall health**. By tracking and evaluating, you can identify the most important health impacts and outcomes your community wants to achieve.

For example, if you create more community gardens, the impact is "access to healthy foods." If you build a health clinic, the outcome is "access to health care." You can **track these exact health impacts and outcomes of the project** and communicate them to all community stakeholders. The following case study gives a few examples of impacts and associated outcomes.

Residents using their new community garden. Source: Getty Images, 2017.

# Case Study: Ringling Riverfront Redevelopment Project — Baraboo, WI

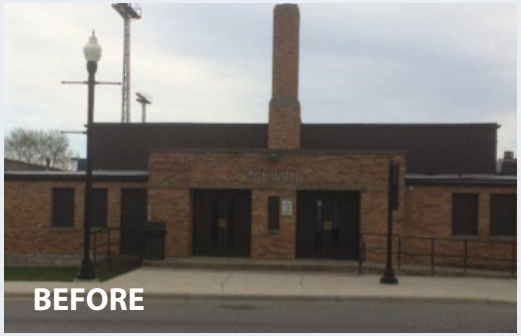



*Image of abandoned gas station in the community. ATSDR Case Study, 2017.*


*Image of new restaurant in the community. ATSDR Case Study, 2017.*


*Map of Baraboo site. ATSDR Case Study, 2017.*

Baraboo, Wisconsin, has a population of 12,048 and is located about 40 miles northwest of Madison.

## What were the contaminants and risks?

The Development Community targeted 10 sites of concern, such as vacant properties and Brownfields. They included a manufactured gas plant, former garage/service stations, heating oil bulk distribution, a waste transfer facility, propane and fertilizer distribution, and abandoned and deteriorated buildings. Contaminants and concerns included polychlorinated biphenyls (PCBs), coal tar residues, impacted sediments, petroleum compounds, lead, heating oil, odor, rodents, leachate, vapor intrusion, anhydrous ammonia, diesel fumes, stormwater runoff, and physical hazards. The Development Community's goal was to improve community health and quality of life through redevelopment.

## What did the Development Community do?

In 2004, with public input and support, municipal and community leaders launched an effort to redevelop an old industrial area along the Baraboo River. They planned to cleanup several Brownfield sites, relocate industries that no longer fit the area, and improve the central part of the city. Residents, the downtown business community, and elected officials all welcomed and supported the plan.

By 2008, the City put together a variety of funding for redevelopment, including Environmental Protection Agency (EPA) Brownfields assessment grants, and Wisconsin Department of Commerce funds.

| STEP | KEY DATE | ACTIVITY | ACCOMPLISHMENT |
|---|---|---|---|
| **Step 1:** Engaging with the Community | January 2008 to September 2010 | The Action Model was introduced as a means of engagement and for community-driven health outcome indicators | Development Community created 33 indicators of community health outcomes associated with the planned Riverfront Redevelopment |
| **Step 2:** Evaluating Environmental and Health Risks | July 2008 | ATSDR and Wisconsin Department of Health Services (WDHS) conducted a technical assist site visit to the public composting area. They noted physical hazards of a former corn silo storage area, such as empty storage bins and a trough filled with water and corn slurry. The site had unrestricted access, and the area had been used for dumping | The city immediately capped the trough, removing a physical and drowning hazard. By January 2010, the propane/fertilizer distributor removed all corn silo equipment, including the capped trough |
| | Winter 2009 | WDHS and the Sauk County Health Department inspected the manufactured gas plant property. WDHS completed a health consultation. They reviewed environmental sampling data for PCBs and coal tar residues | Though soils and groundwater were still contaminated with PCBs and coal tar residues, they **did not pose human health concerns**. WDHS recommended vegetation of the site to prevent exposures to people |
| **Step 3:** Communicating Environmental and Health Risks | July 2008 to Fall 2010 | The City, ATSDR, WDHS, and Sauk County Health Department communicated results of site inspections and health consultation to the Development Community | They informed the community of all potential risks and addressed their questions and concerns |
| **Step 4:** Redesigning with Health in Mind | 2008 to Present | The City set a theme for redevelopment that was eco-friendly to the Baraboo Riverfront | New businesses and investments fit the theme of redevelopment |
| **Step 5:** Measuring Success | 2011 and 2012 | ATSDR and the city, respectively, created "Report Cards" to track changes in health outcomes | Key indicators showed improved health outcomes |

## List of Impacts and Return on Investment:

| OUTCOMES | IMPACTS |
|---|---|
| Cleaned up environmental contaminants creating a safer, healthier community | **4 of 10 (40%) of sites were removed, remediated, or redeveloped,** removing potential exposures to contaminants |
| Engaged the community in the redevelopment from the early planning stages | Redevelopment plans were shaped around public input, including plans for mixed-use, mixed-income housing<br>The community volunteered to create a stormwater biofiltration pond, which reduced impacts to the Baraboo River |
| Completion an extension of the Riverwalk | The expansion **increased access to riverfront recreation for the 12,000 residents and 60,000 visitors** who visit Circus World Museum each year |
| Began construction in March 2017 of new Public Safety/ Administration building in the redevelopment gateway area along the south bank of the river — the main artery into downtown | The site combines the former manufactured gas plant and additional properties, reducing blight and potentially harmful exposures<br>The facility is approximately $13.5 million and 48,000-square feet. Other properties in the redevelopment area are slated to be sold to private investors, essentially **offsetting the $13.5 million expense** |
| Increased jobs, tax base, and land reuse goals | The City contributed land for distillery and restaurant buildings. Fifteen new jobs have been created. The City also provided a **development incentive of $250,000, which added approximately $3 million to the local tax base**<br>**Three additional properties are slated for reuse**: a former train depot, the historic home at the gateway to the redevelopment, and a former service station |

## Get Started Now

Contact ATSDR to learn how you can begin the process of healthy land reuse.

www.atsdr.cdc.gov/sites/brownfields

ATSDR.LandReuse@cdc.gov

# Appendix

# Appendix A: Bibliography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# Appendix B: Resource Matrix

| Link | Section | Description |
|---|---|---|
| National Priorities List | Introduction | Information about EPA's Superfund program |
| BROWN | Introduction | Information about the Brownfields & Reuse Opportunity Working Network (BROWN) |
| ATSDR Action Model Toolkit | Step 1 | The ATSDR Action Model Toolkit |
| Action Model | Step 1 | Information on the ATSDR Action Model |
| guidelines for both ESA I and II | Step 2 | The American Society for Testing and Materials (ASTM) International |
| ATSDR Partnership to Promote Local Efforts to Reduce Environmental Exposure | Step 2 | Information on APPLETREE state cooperative program |
| health assessment | Step 2 | Public health assessments & health consultations reports |
| more information | Step 2 | The ATSDR Petition Process |
| TAB program | Step 2 | TAB program at Kansas State University website |
| TAB program | Step 2 | TAB program at New Jersey Institute of Technology website |
| resources | Step 2 | TAB program at Center for Creative Land Recycling website |
| offers assessment grants | Step 2 | EPA's list of Types of Brownfields Grant Funding |
| site eligibility for funding | Step 2 | EPA's list of Types of Brownfields Grant Funding |
| funding opportunities | Step 2 | ATSDR Brownfield/Land Reuse Health Program Funding Opportunities |
| Grants.gov | Step 2 | Grants.gov website |
| tool for grant writing tips and obtaining grants | Step 2 | Presentation on how to write a grant application via UNC.edu |
| best practices | Step 2 | Best Practices to Be Grant-Ready |
| Health Impact Assessment | Step 2 | Information on health impact assessments |
| guidelines for local health officials | Step 2 | "Protocol for Assessing Community Excellence in Environmental Health (PACE-EH) Guidebook" |
| adapted and updated | Step 3 | EPA's Seven Cardinal Rules of Risk Communication |
| more information on risk communication | Step 3 | Information about risk communication via EPA |
| arsenic | Step 3 | Information about arsenic via ATSDR's Toxic Substance Portal |
| asbestos | Step 3 | Information about asbestos' impact on your health via ATSDR |
| message map template | Step 3 | ATSDR's Message Mapping Template, Worksheet, and Checklist |
| resource directory | Step 4 | EPA Economic Development Directory |