

Brownfield Basics Overview



Elizabeth Limbrick, PG, LSRP
University of South Florida, Tampa, FL
June 6, 2018

What is a Brownfield?

“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.” USEPA



Newer Brownfield Sites

Not just the industries of the 19th century...



Disadvantages of Having a Brownfield Site

- Potential harm to human health
- Degradation of the environment – soils, water, air
- Lowers surrounding property values
- Contributes to neighborhood deterioration
- Contributes to negative perception of the neighborhood



https://en.wikipedia.org/wiki/Brownfield_land



http://fieldsenvironmentalinc.com/brownfield_redevelopment

- Reduces local employment opportunities
- Reduces or loss of tax revenue
- Limits economic growth



<http://www.bnd.com/news/local/community/highland-news-leader/article33406179.html>

- Attracts vandals, open dumping, or other illegal or unwanted activity
- Contributes to sprawl – as activities locate on greenfields

Why is Brownfield Redevelopment Important?

- Fostering New Growth on Old Land
- **Opportunity** to become a Community Asset
- Economic, Environmental, and Societal Benefits
 - Economic – Links the Environment and Economy
 - Return abandoned and underutilized properties to the tax rolls
 - Increase local tax base
 - New jobs
 - Typically brownfield properties are available at reduced real estate prices



http://blog.cleveland.com/metro/2008/11/pittsburghs_renaissance_holds.html

Why is Brownfield Redevelopment Important? (Continued)

– Environmental / Societal Benefits

- Cleans up the Environment
 - Eliminates health and safety hazards
 - Alleviates fears and worries for neighbors
- Values Existing Infrastructure
- Reduces Development Pressure for Undeveloped Land – Preserves Greenspace and Farmland
- Prevents Sprawl – Encourages Planned Growth



<http://www.deedworks.org/>

Benefits to the Public

When Brownfields sites are not addressed – they may become public health threats:

- Occupant Exposure
- Off-Site Exposure
 - Runoff
 - Fugitive Dust / Emissions
 - Vapor Intrusion
 - Contaminated Drinking Water (less likely)

Eye Sores

Attractive Nuisances

Why Should I Care About Brownfields?

Brownfields are hidden assets.

You should be interested in Brownfield Redevelopment, if you :

- Improving the Environm
- Improving the Local Eco
- Sustainability



Redevelopment: Parks, Recreation, and Open Space

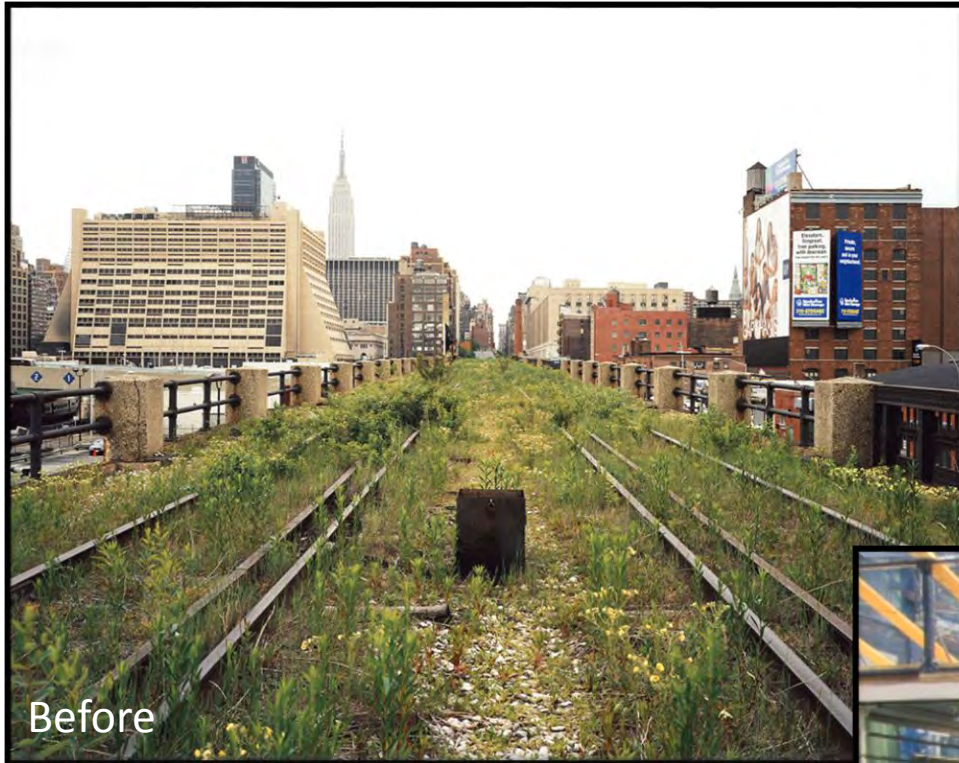


Lardner's Park Point / East Coast Greenway, PA



Cynwyd Heritage Trail, PA

Redevelopment: Parks, Recreation, and Open Space



Before

The HighLine, NYC



After

Redevelopment Option: Commercial, Light Industrial



Bronx Terminal Market, New York



**FedEx Facility,
Newark, NJ**

Redevelopment Option: Residential



Alexan Cityview, Bayonne, NJ

Redevelopment Option: Mixed Use



Harrison Commons, Harrison, NJ

Redevelopment Option: Green Energy



Solar Farm, PSE&G, Trenton, NJ

Redevelopment Option: Public/Government



Camden ECDC School, NJ



**Mercer County Criminal
Courthouse, Trenton, NJ**

Redevelopment Option: Urban Agriculture



Urban Commercial Farm, Lynchburg, VA



**Community Garden,
Philadelphia, PA**

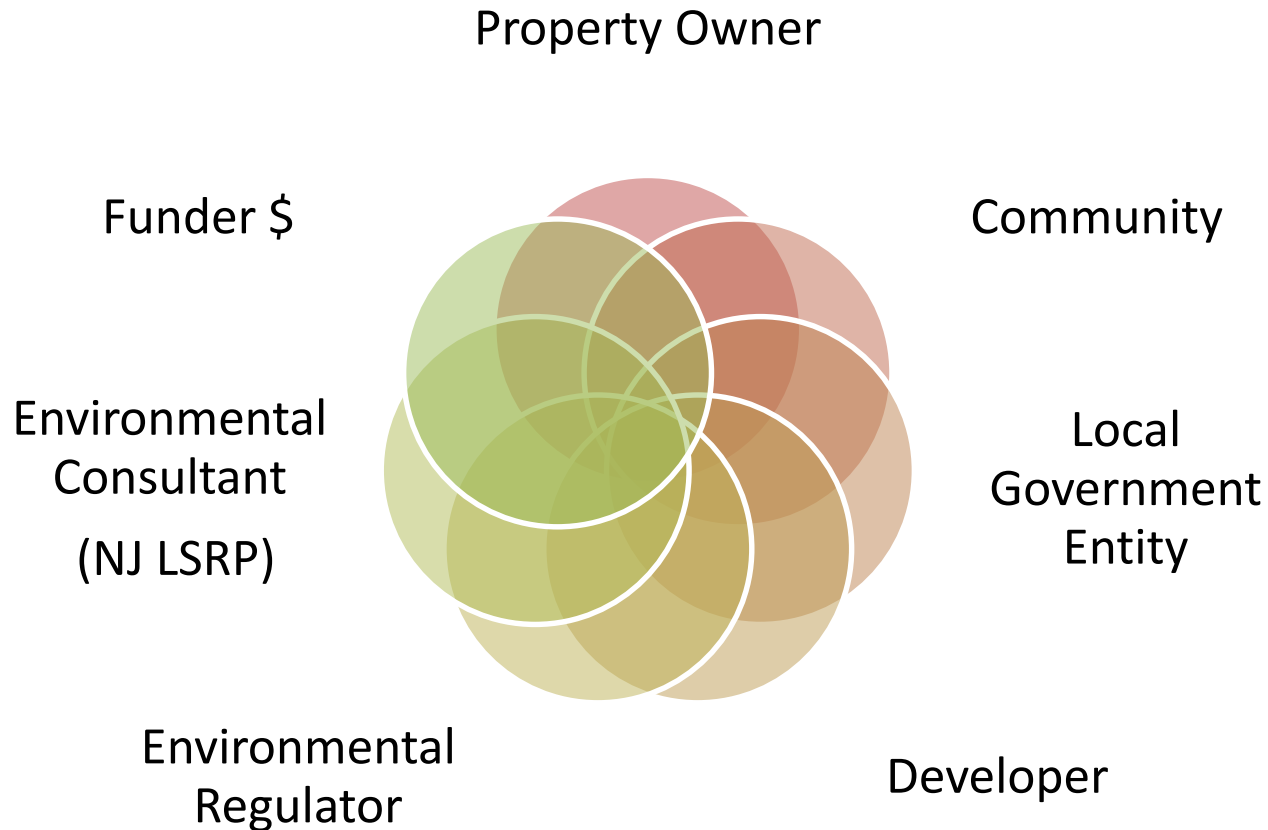
Steps in the Brownfield Redevelopment Process

Yes – I
have
brownfield
site....
Now
What?



<http://wisconsinwatch.org>

Who is Typically Involved with Redeveloping a Brownfield?



The Brownfields Road Map illustrates the general steps involved in the investigation and cleanup of a brownfields site.

Actual steps may vary depending on site conditions and applicable state and federal regulations. Stakeholders should consult with appropriate regulatory agencies throughout the process and enlist qualified technical and legal services.

View an interactive, online map at www.brownfieldstsc.org/roadmap that contains links to information about the general phases and spotlight topics.

Learn the Basics

Before you begin down the path outlined in the road map, it is important to get prepared. Preparation typically consists of the following activities:

- Setting reuse goals and planning
- Understanding regulations, regulatory guidelines and liability concerns
- Engaging the community
- Identifying funding
- Seeking professional support

Begin Here

Brownfields Road Map



Spotlights

The Road Map "spotlights" highlight key issues, processes and initiatives. Each spotlight provides a summary of topics relevant to brownfields projects and identifies related resources. The following spotlights are included in the Road Map:

Learn the Basics

1. Redevelopment Initiatives (p. 15)
2. Supporting Tribal Revitalization (p. 16)

Assess the Site

3. All Appropriate Inquiries (p. 18)
4. Project Life Cycle Conceptual Site Model (p. 22)

Investigate the Site

5. Data Quality (p. 25)
6. High-Resolution Site Characterization and In Situ Technologies (p. 29)
7. Vapor Intrusion (p. 30)

Assess and Select Cleanup Options

8. Challenging Cleanups (p. 35)
9. Understanding the Role of Institutional Controls (p. 36)

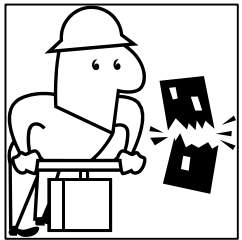
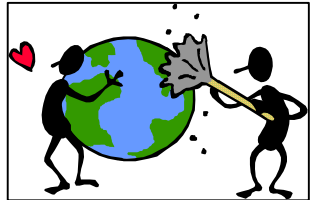
Design and Implement the Cleanup

10. Greener Cleanups (p. 40)

The Brownfields and Land Revitalization Technology Support Center

Provided by the U.S. EPA, Argonne National Laboratory, and the U.S. Army Corps of Engineers

What is Typically Involved with Redeveloping a Brownfield?



Site Identification/Community Involvement/
Planning

Acquisition / Site Control /
Environmental Investigation

Environmental Remediation

Site Preparation

Redevelopment

What is Typically Involved with Redeveloping a Brownfield?

What is driving your need to redevelop a site?

- Community
- Initiative of Local Governing Unit
- Developer Interest
- Other
- Reuse Goal

What is Typically Involved with Redeveloping a Brownfield?

Site Identification

- Inventory
- Single Site
- Common Types of Sites
- Area-wide Approach to Sites

Community Involvement

- Analyze community needs and preference to prioritize development strategies
- Can be a critical piece of redevelopment
- Often ignored by developers
- Video Links <http://www.nyc.gov/html/oer/html/Videos/revitalization.shtml>
<http://www.nyc.gov/html/oer/html/Videos/communities.shtml>



What is Typically Involved with Redeveloping a Brownfield?

Planning

- Evaluating existing environmental conditions, local market potential, and area infrastructure improvements needed;
- Developing strategies for brownfields site cleanup/reuse;
- Identifying resources or leveraging opportunities to implement their plans.



What is Typically Involved with Redeveloping a Brownfield?

Acquisition / Site Control

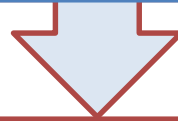
All Appropriate Inquiry
(Phase I Environmental Site Assessment)



Steps in the Brownfield Redevelopment Process

Phase I Preliminary Assessment

What environmental issues could we have?



Phase II Site Investigation

Qualify: Do we have contamination/environmental issues?

Yes or No?



Phase III Remedial Investigation

Quantify: What is the nature and extent of our contamination?

How much?



Phase II Subsurface Investigation

- Test Pit Excavation
- Drilling
- Soil & Groundwater Sampling
- Vapor Intrusion Testing

Test Pit Excavation



Buried Tannery Waste



Soil Borings & Wells



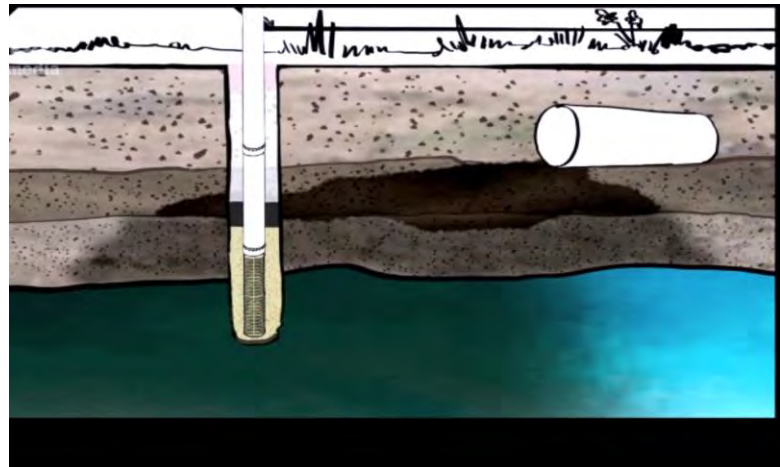
Oil in Soil Cores



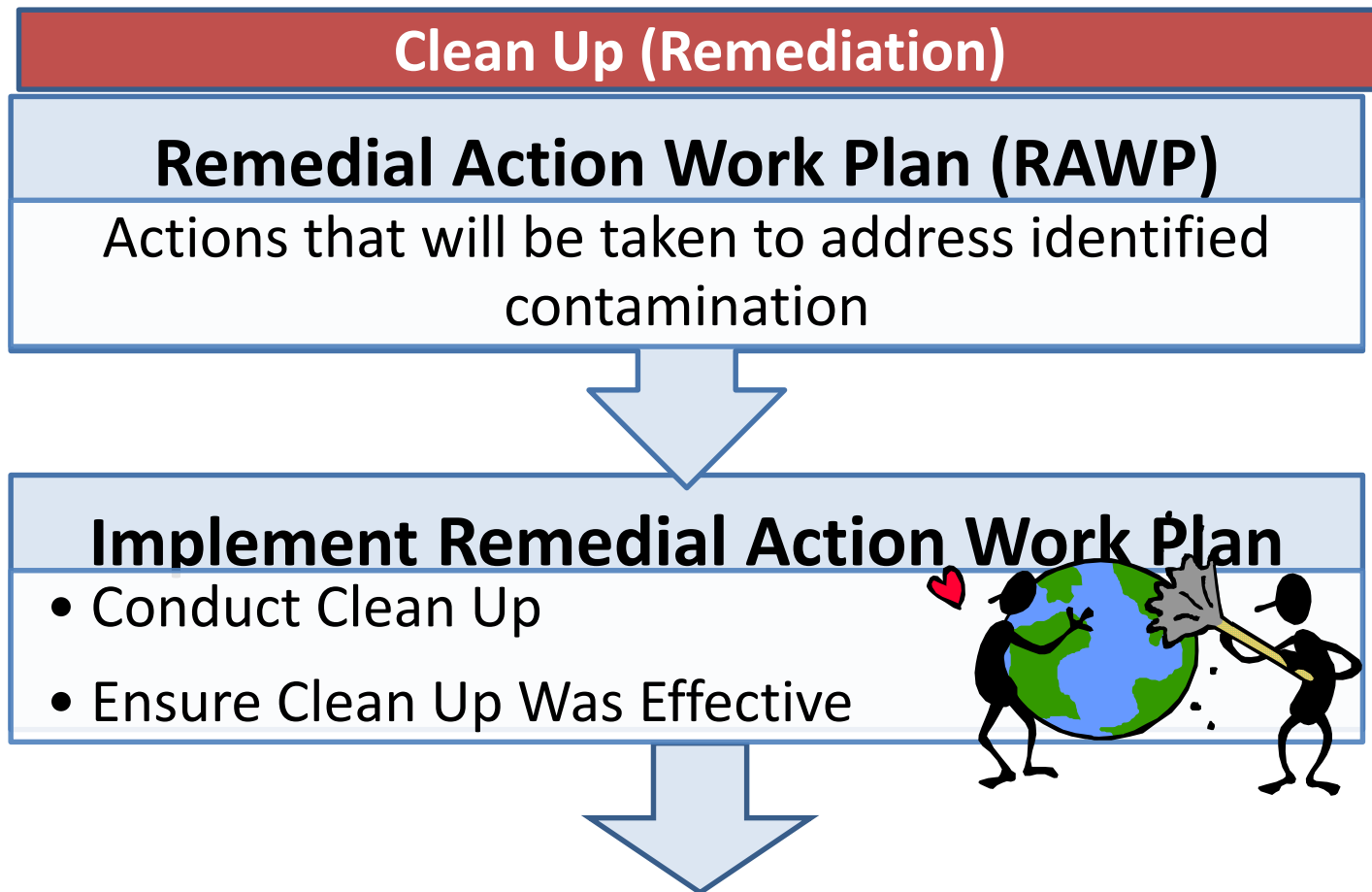
Video – Environmental Investigation

For reference on environmental investigations – see this 8 minute video.

<http://www.nyc.gov/html/oer/html/Videos/investigations.shtml>



What is Typically Involved with Redeveloping a Brownfield?



Remediation

- Tank Removal
- Contaminated Soil Excavation
- Groundwater Treatment
- Barrier & Cap Technologies
- In-Situ Stabilization

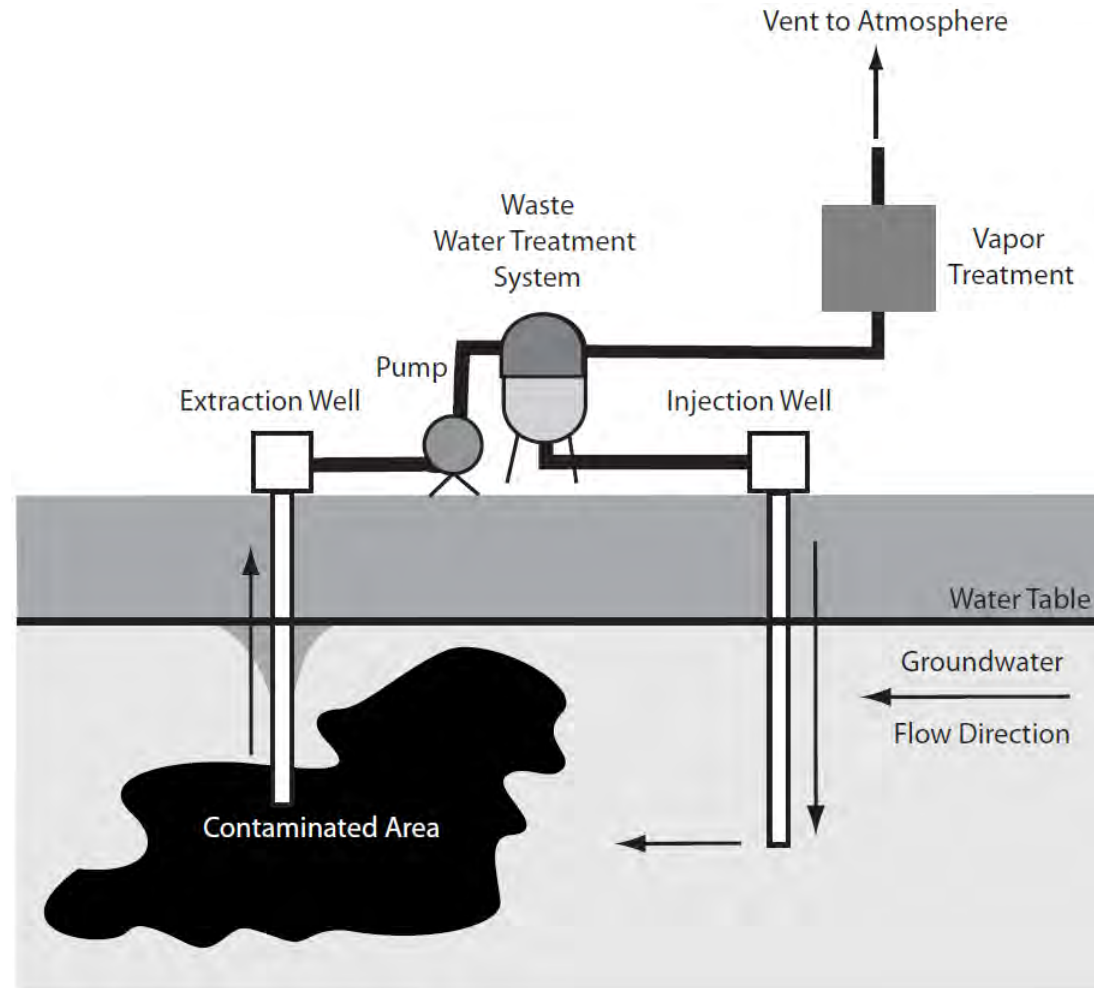
Tank Removal



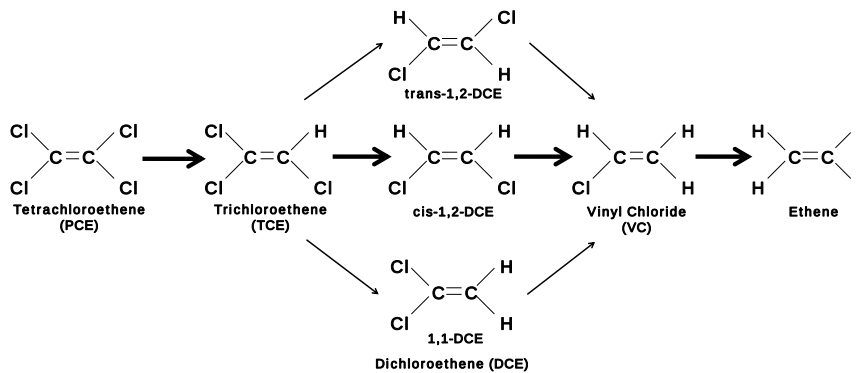
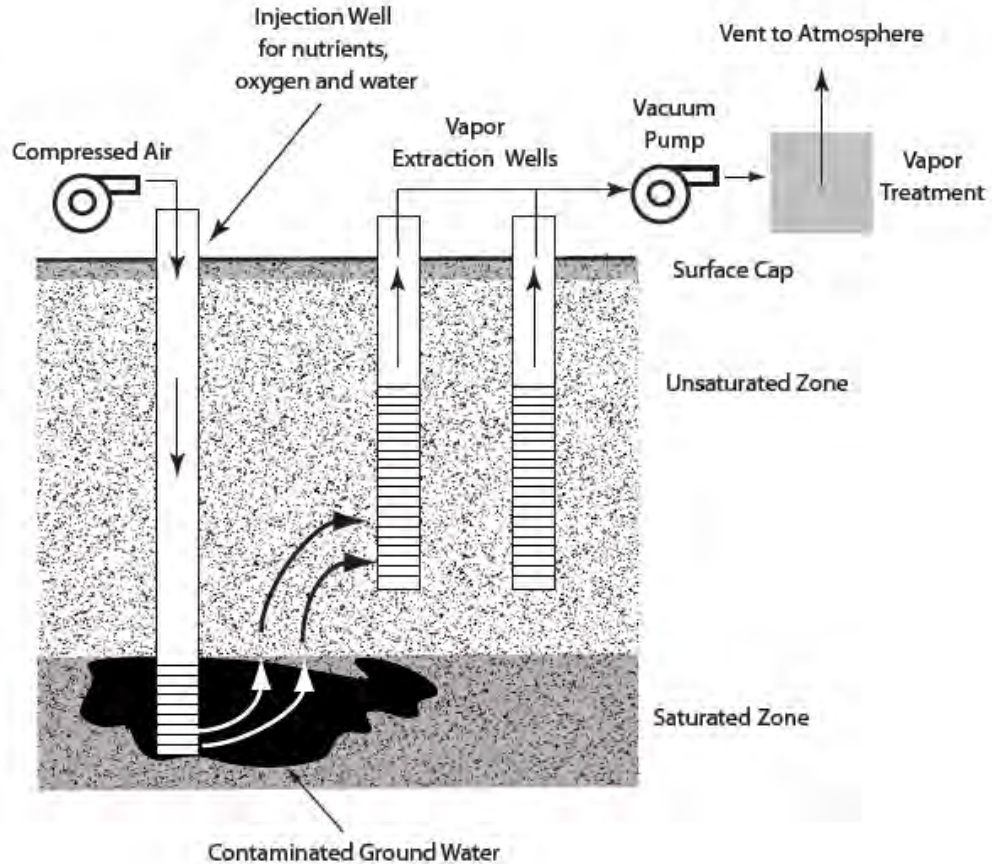
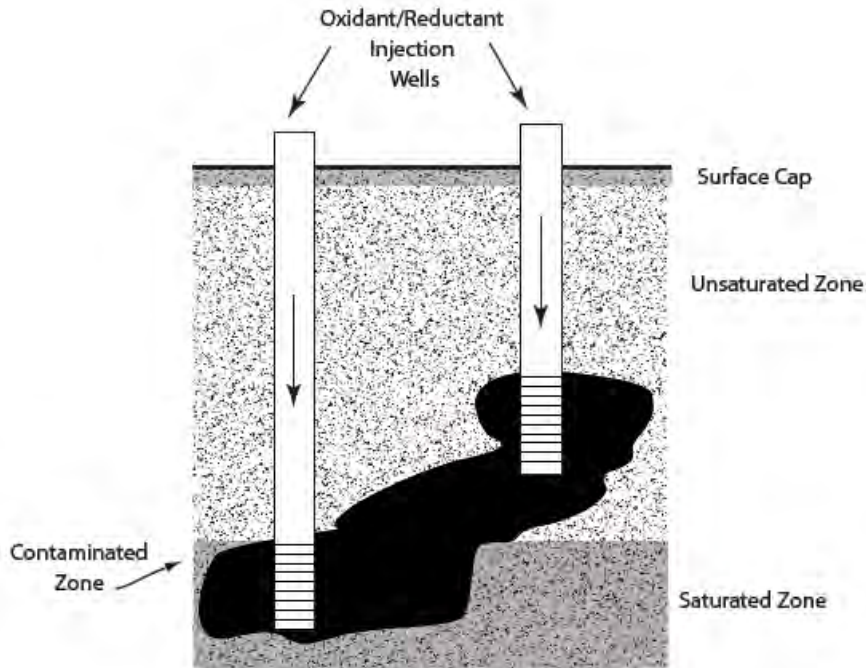
Holes in Leaking UST



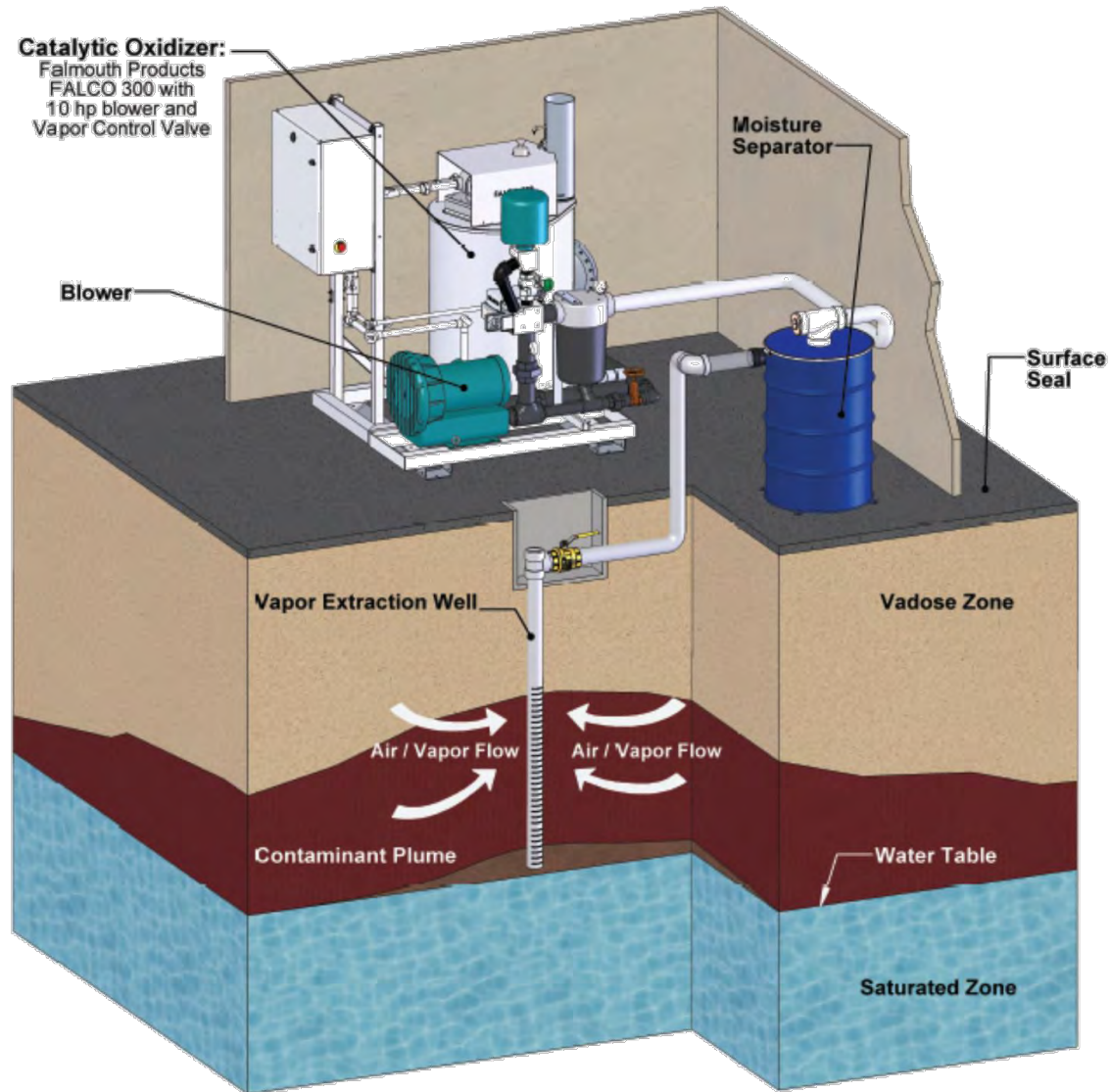
Remediation By Source Removal



“In Situ” Remediation



Groundwater Treatment



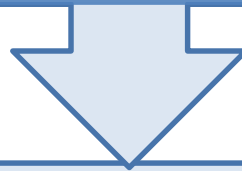
SOIL VAPOR EXTRACTION (SVE)

What is Typically Involved with Redeveloping a Brownfield?

Clean up (Remediation)

Remedial Action Report

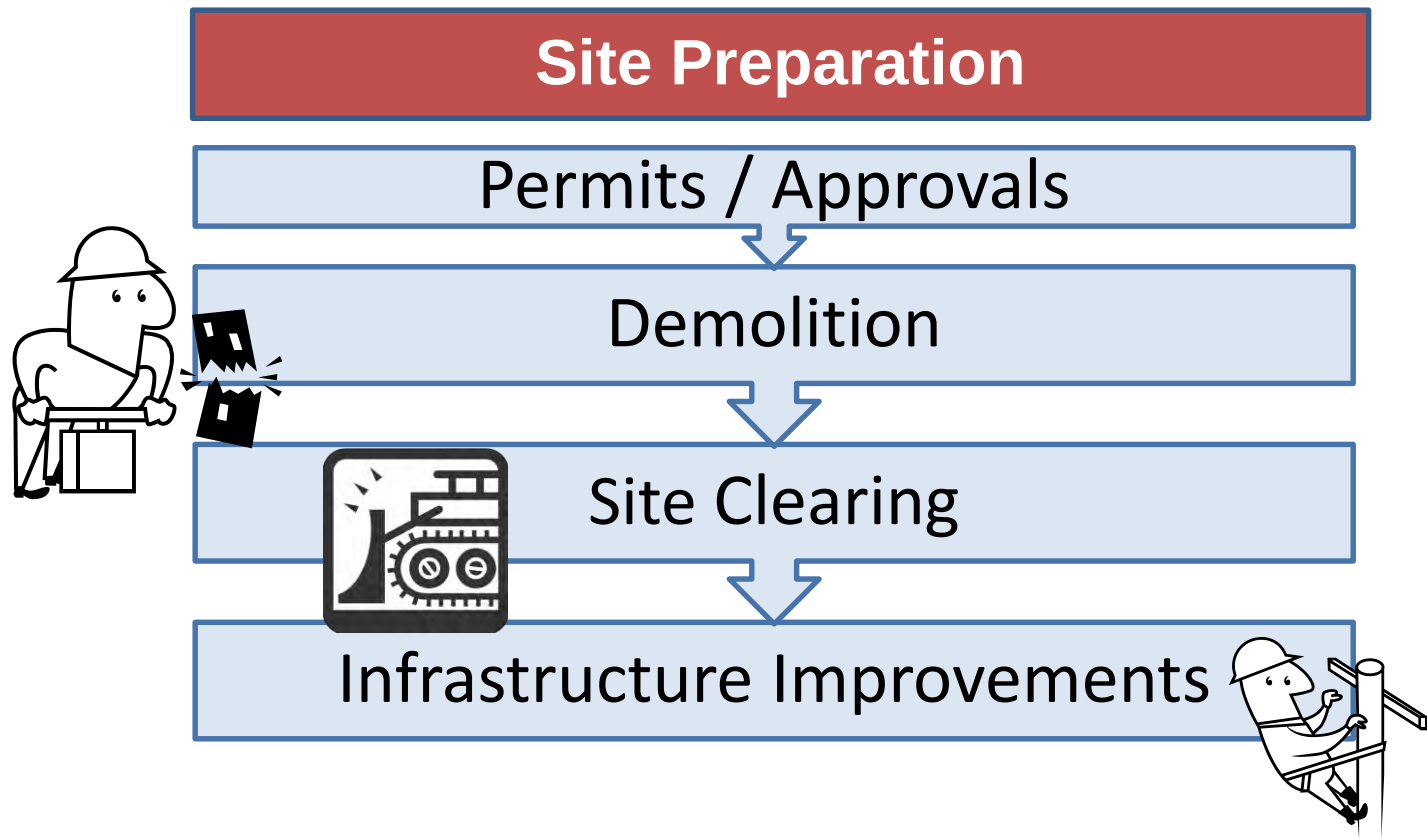
Documents implementation and effectiveness of Remedial Actions



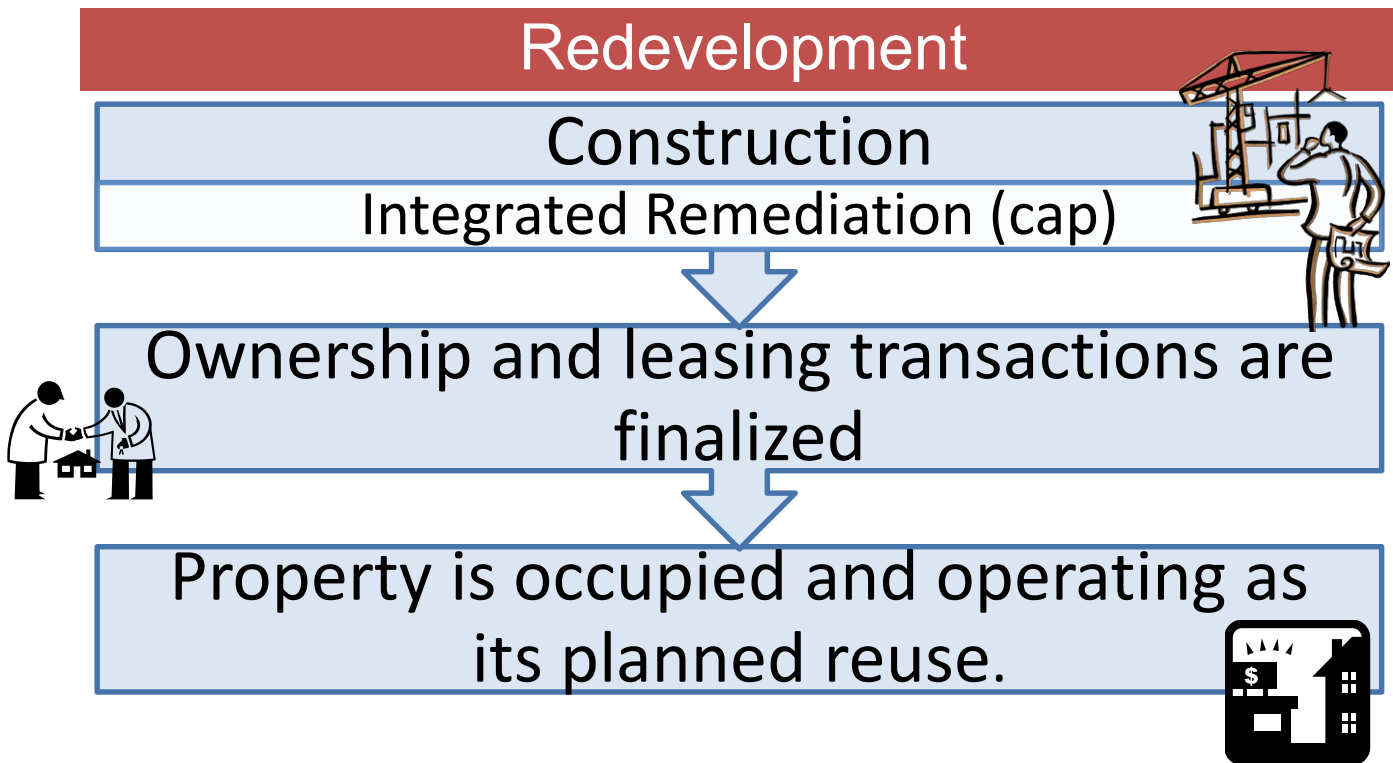
Measure of Finality



What is Typically Involved with Redeveloping a Brownfield?



What is Typically Involved with Redeveloping a Brownfield?



Steps in the Brownfield Redevelopment Process

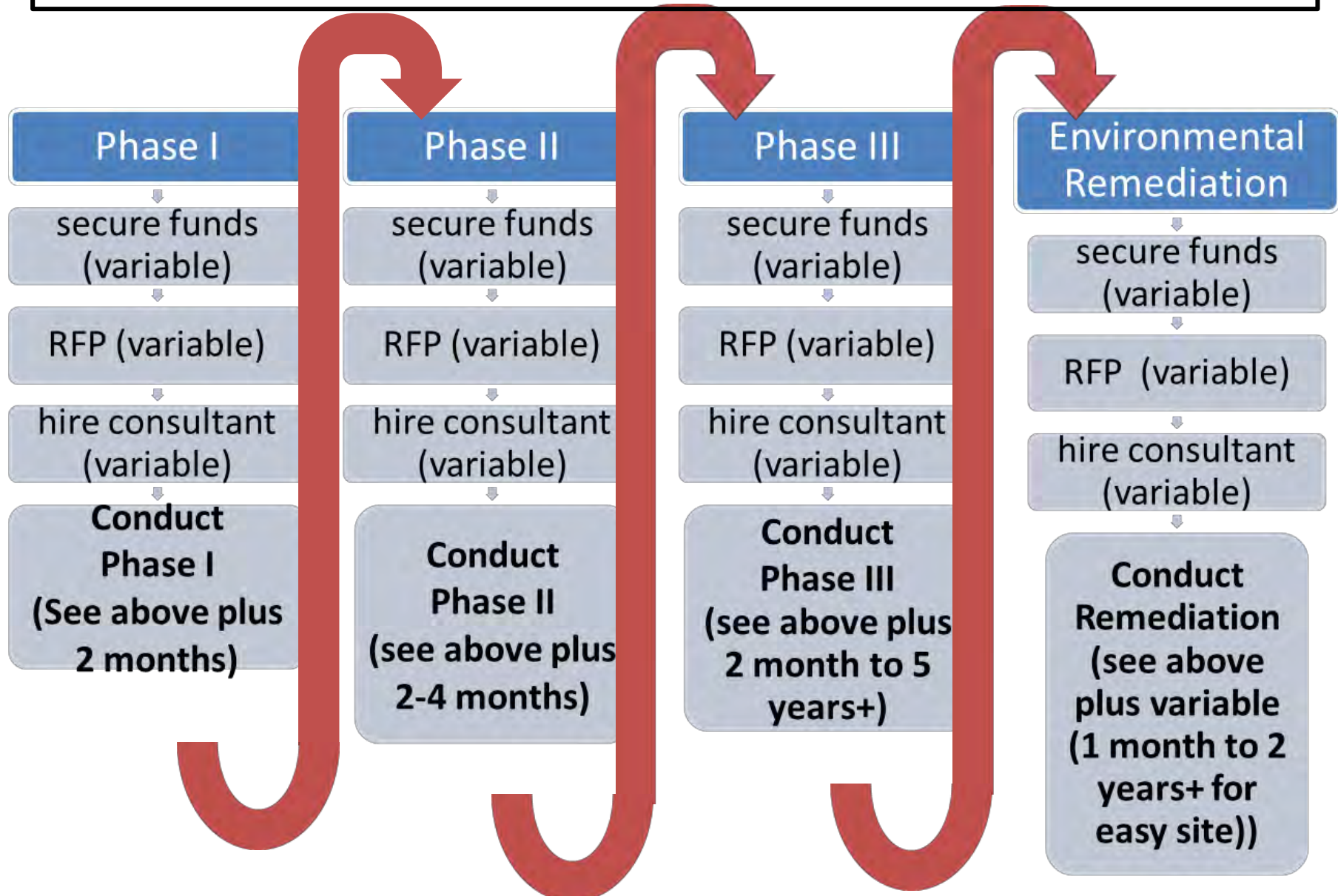
How long will the cleanup take?

It depends:

- level, type, amount, and extent of contamination
- cleanup standards
- availability of funding



Steps in the Brownfield Redevelopment Process



Steps in the Brownfield Redevelopment Process

How much will it cost to investigate and remediate the site?

It depends:

- level, type, amount, and extent of contamination
- cleanup standards
 - Phase I \$5,000
 - Phase II \$5,000 to well over \$100,000
 - Phase III??? \$5,000 - \$300,000+
 - Remediation \$20,000 - \$1Million+



Financing Brownfield Redevelopment

- Technical Assistance
- Tax Incentives
- Local Financing Tools
- Low Interest Loans
- Loan Guarantees
- Federal Grants



Types of EPA Brownfield Funding

- Assessment Grant
- Cleanup Grant
- Revolving Loan Fund (RLF)
- Environmental Workforce Development and Job Training Grants
- Targeted Brownfield Assessments (TBA's)

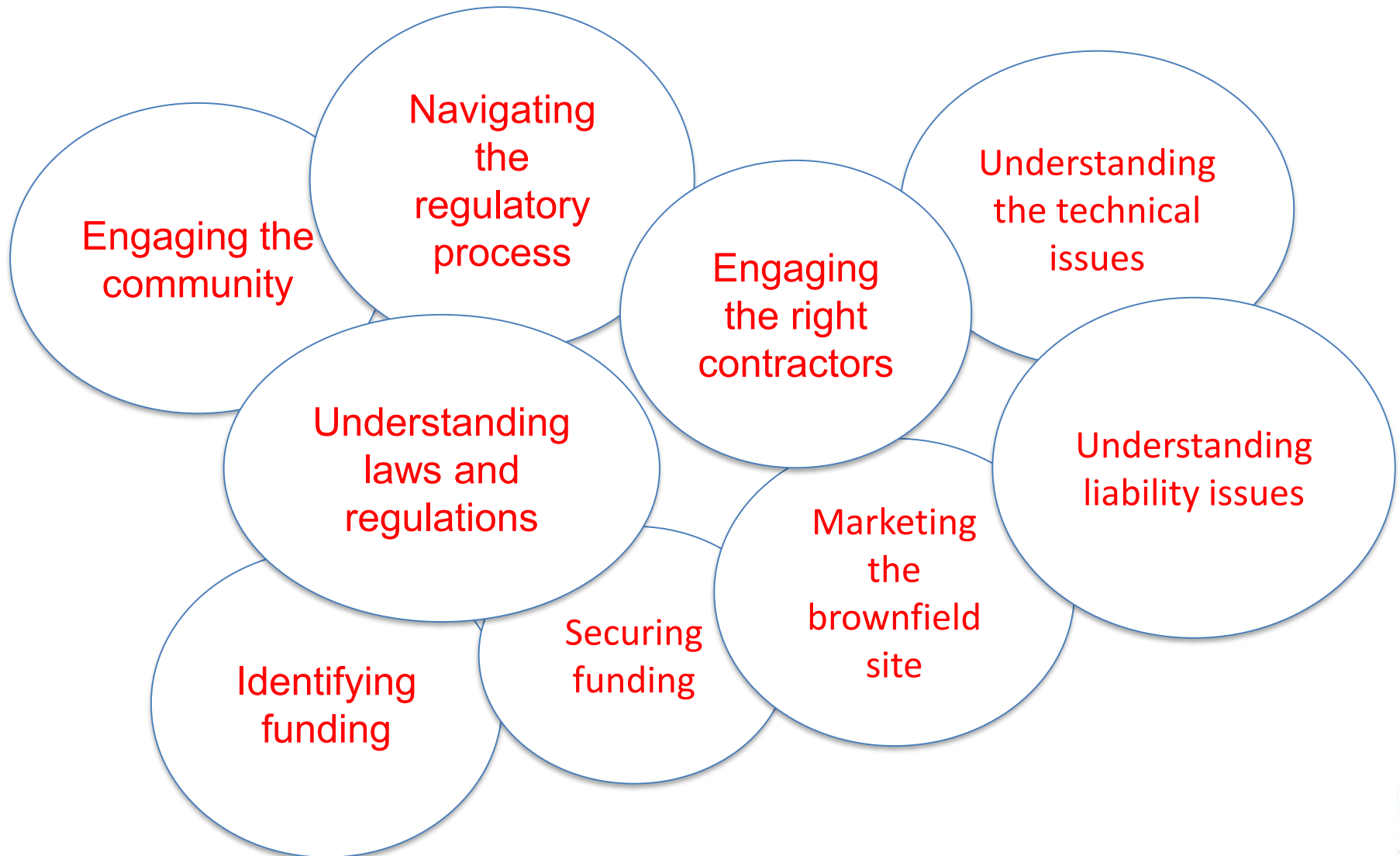


Brownfields – Economic Development Tool

- Brownfields are **opportunities**
- Tap into funding not available to other sites
- Brownfield redevelopment can be the catalyst that will stimulate other redevelopment efforts
 - Reducing Blight / Stigma can attract developers
 - Surrounding property owners tend to reinvest
- Increase in tax rates
- Employment opportunities



HELP!!!



Technical Assistance to Brownfield Communities (TAB)

TAB is a technical assistance program created by EPA and funded through cooperative agreements with three TAB providers that each cover some of the EPA regions.

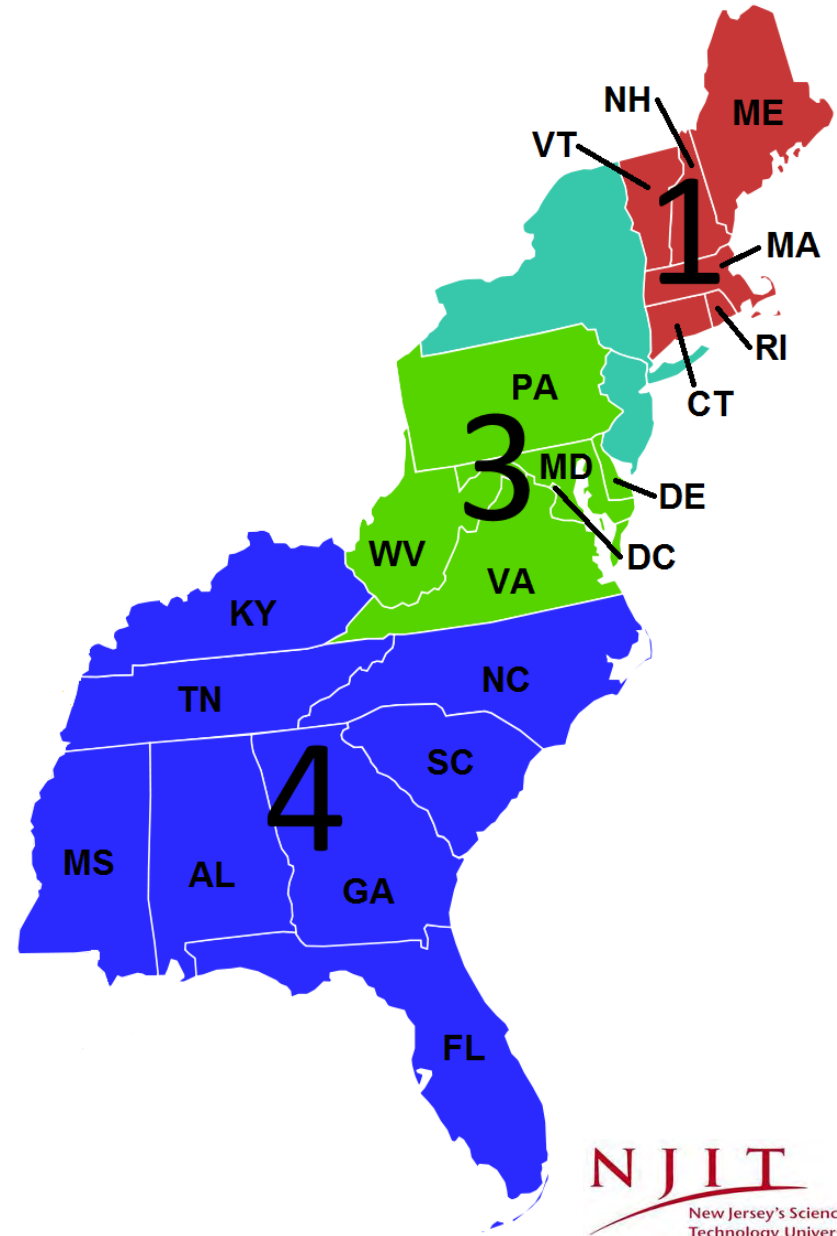
TAB providers serve as independent resources to: state, regional, county, tribal, and local government entities, and nonprofits attempting to cleanup and reclaim brownfields.



➤ **Assistance is *free* of charge!**

NJIT TAB Service Area

New Jersey Institute of Technology (NJIT) is the TAB service provider for EPA Regions 1, 3, 4



➤ **Assistance is *free* of charge!**

NJIT TAB Team



Colette Santasieri, PhD
Executive Director

santasieri@njit.edu

973-642-4165



Sean Vroom
Project Manager

svroom@njit.edu

973-596-6415



Elizabeth Limbrick
Project Manager

limbrick@njit.edu

973-596-5519



Gary White
Project Manager

gwhite@njit.edu

973-596-5506

Plus specialized subcontractors

TAB provides assistance* throughout the *entire* brownfields redevelopment process.

Assistance is provided through...

- ❖ Resource Center
- ❖ Educational Forums
- ❖ One-on-one Technical Assistance



NJIT Technical Assistance to Brownfield Communities (TAB)

NJIT TAB Resource Center

www.njit.edu/tab

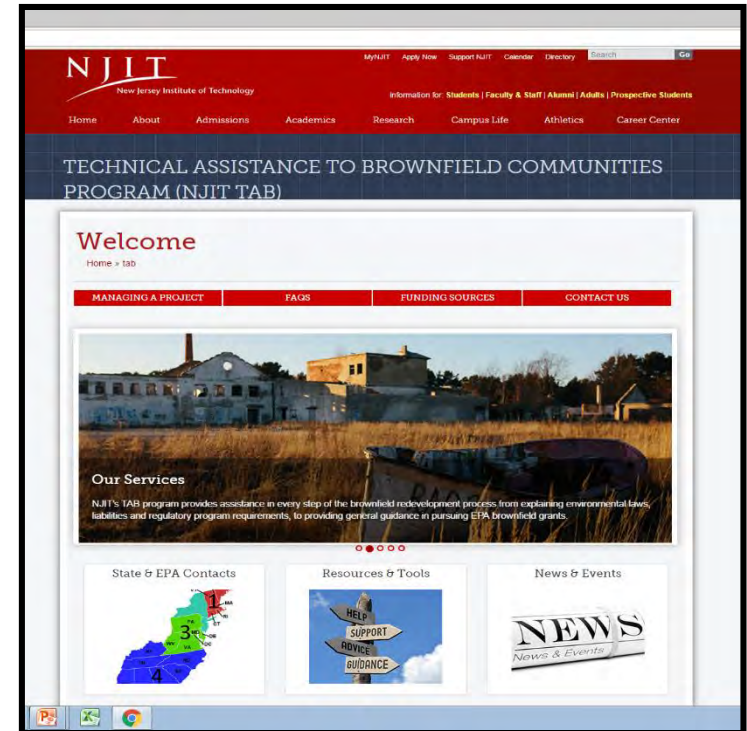
- ❖ info on all aspects of assessing and cleaning up a brownfield site
- ❖ news and upcoming events

Resources and Tools

- ❖ Federal and state funding sources
- ❖ state brownfield programs
- ❖ state and EPA contacts
- ❖ previously recorded webinars
- ❖ downloads of workshop and seminar presentations
- ❖ PCB brochures; GI decision tree
- ❖ how-to videos (*coming soon*)

NJIT TAB Hotline

973-642-4165 tab@njit.edu



NJIT TAB Educational Forums

Conferences: pre-conference workshops, learning labs, panel sessions, office hours

Workshops: 2 to 4 hour interactive sessions on brownfield related topics

Seminars: deeper dive into specific brownfield related topics

Brownfield Boot Camps: 4 to 7 hour more intensive, deep dive into specific brownfield related topics

Webinars: range from introducing the TAB program to specific brownfield topics

All-Grantee Meetings: work with state agencies and EPA

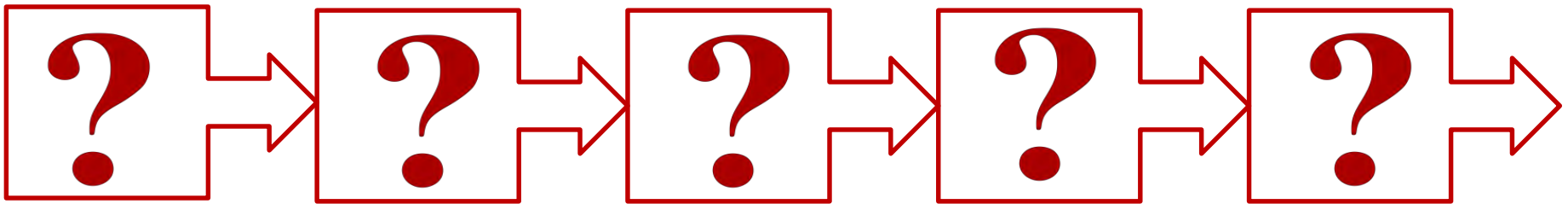


One-on-One Technical Assistance

Every community is different and every community's needs are different.

NJIT TAB addresses the commonly faced challenges, as well as the unique challenges - one community at a time.

Brownfields Redevelopment Spectrum



The type and depth of assistance NJIT TAB provides is tailored to the needs of the community.

Thank You

Elizabeth Limbrick, PG, LSRP - NJIT TAB

limbrick@njit.edu

www.njit.edu/tab



The Brownfields Program

U.S. Environmental Protection Agency

Barbara Alfano.
Region 4 Brownfields Coordinator
U.S. EPA
Atlanta, GA

June 2018



Superfund and Brownfields

Two paths that can lead in the same direction



Superfund vs. Brownfields Program



Superfund -Enforcement Driven

- Polluter Pays
- Site Discovery at any time
- Citizens can request EPA conduct a Site Assessment on any site
- Sites Discovered by Citizens and environmental authorities
- EPA contractors or the State conducts the work
- EPA makes the cleanup decision with State and Public input

Brownfields - Local Government Driven

- EPA Grant Pays
- Annual competition for EPA funding
- Sites Identified and Selected by local government
- Grant recipient contractors conduct the work
 - Unless it is a Targeted Brownfields Assessment
- Grant recipient makes the cleanup decision with State oversight and Public input

Superfund vs. Brownfields Program

Superfund Deliverables

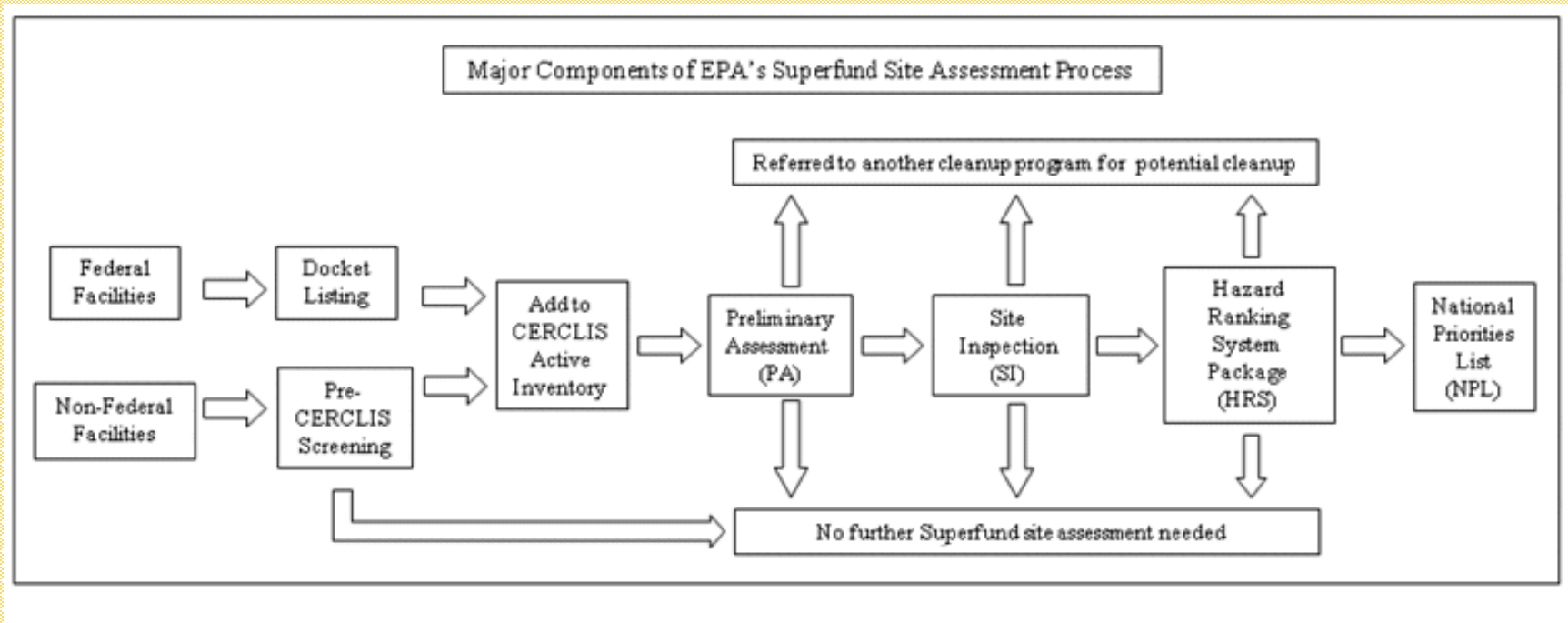
- Preliminary Assessment
- Site Inspection
- Expanded Site Inspection
- Remedial Investigation
- Feasibility Study

Brownfields Reports

- Phase I Environmental Site Assessment
- Phase II ESA
- Supplemental Site Assessment
- Analysis of Brownfields Cleanup Alternatives

One thing in common is the Quality Assurance Project Plan –
Required for all EPA projects that involve sampling

Superfund Site Assessment Process



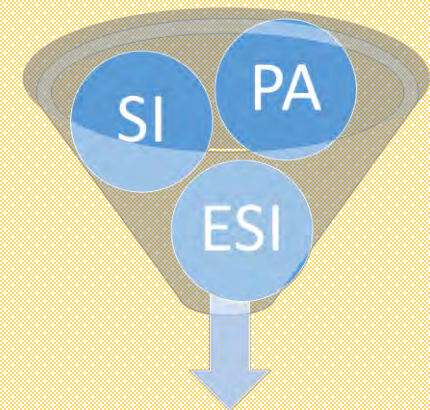
Only a very small percentage of sites assessed go in to the National Priorities List

Sites can go from Superfund Site Assessment to Brownfields

- Superfund Sites in the Site Evaluation stage
 - Preliminary Assessment (PA)
 - Site Inspection (SI)
 - Expanded Site Inspection (ESI)
 - Sometimes even if an Hazardous Ranking System package has been completed!

Unless

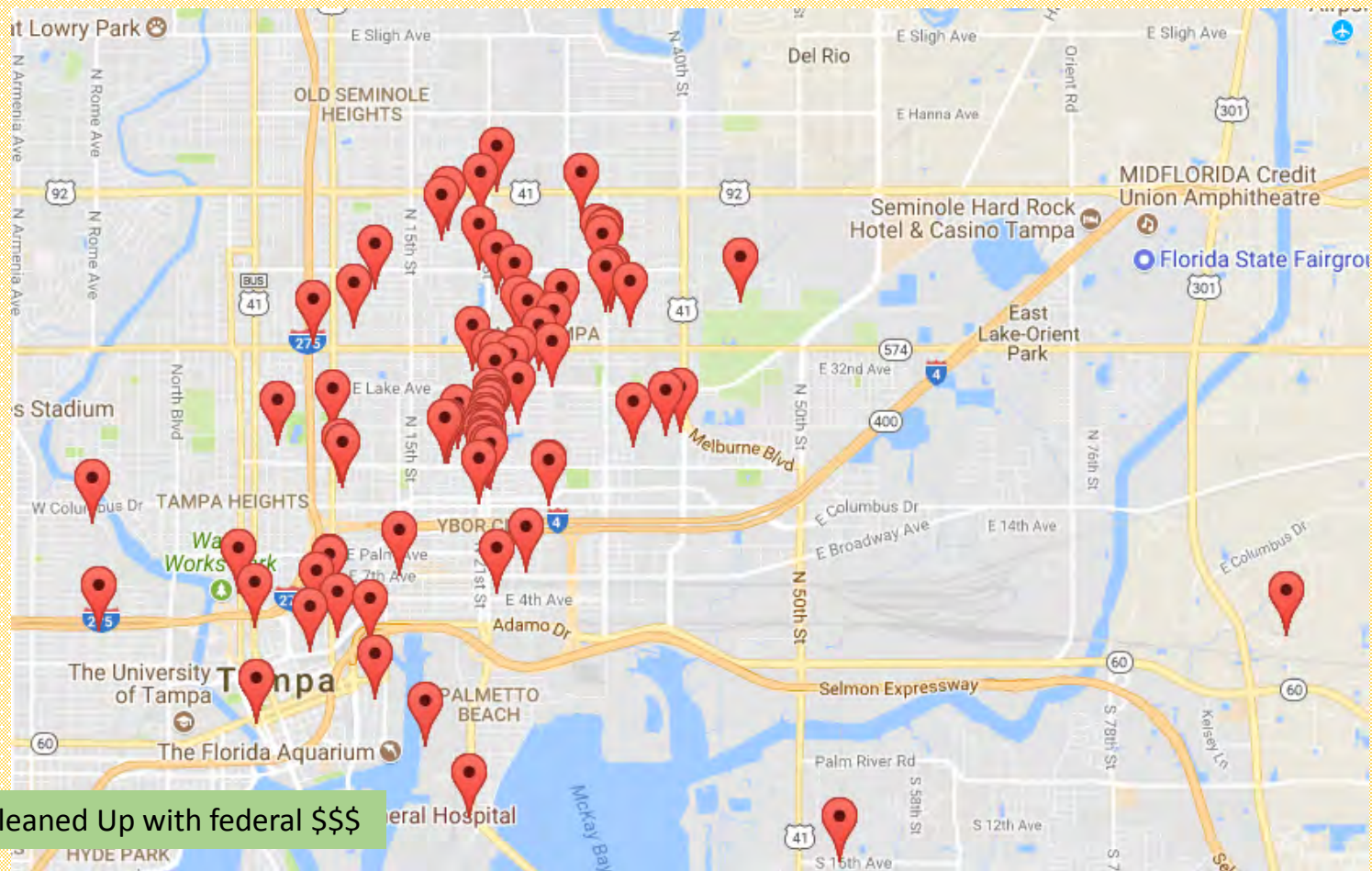
- They have a CERCLA order associated with them
(uncommon at the site evaluation stage of Superfund)
- They are a federal facility
(Federally Used Defense Sites (FUDS) are okay since they are no longer owned by Federal government)



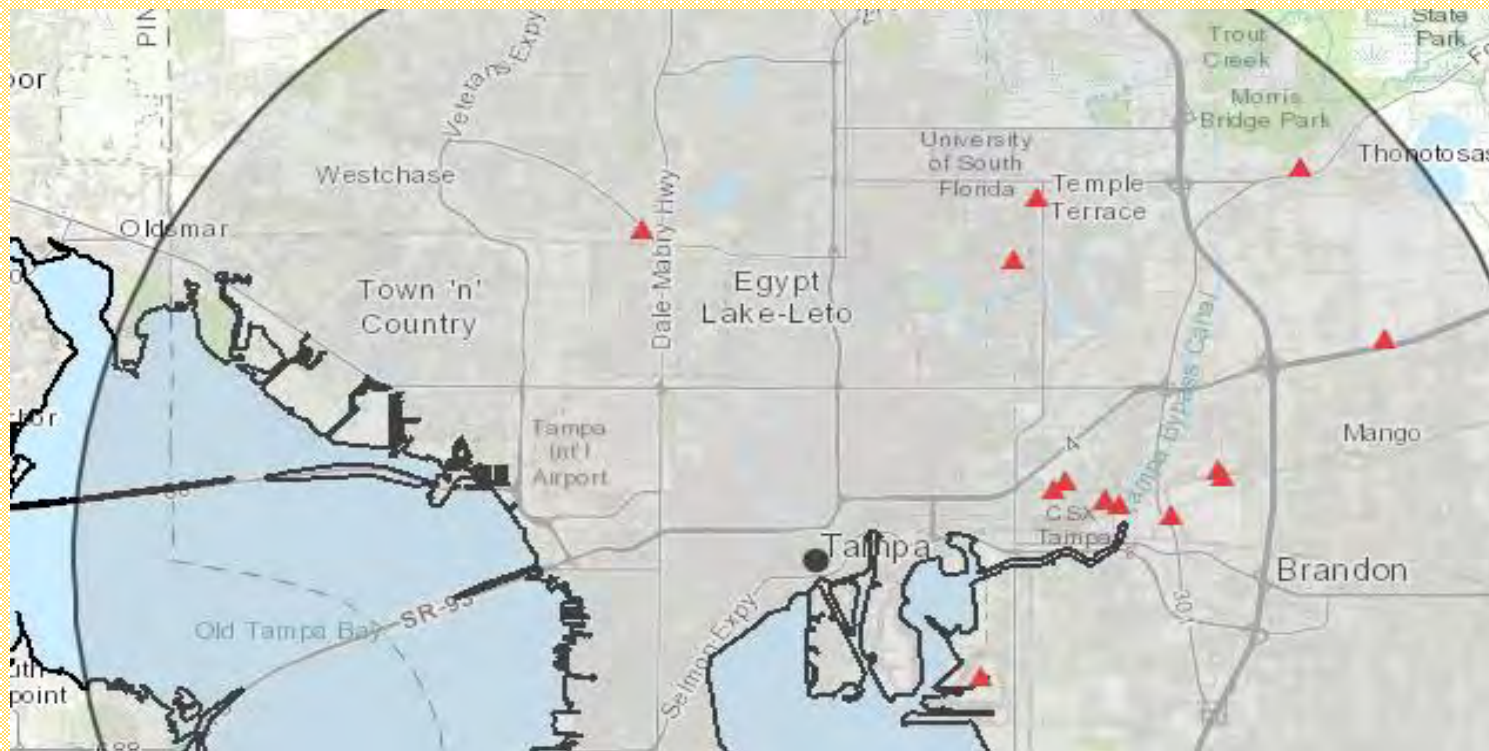
What cannot be a Brownfields

- Sites listed or proposed for listing on the NPL
- Facilities subject to unilateral administrative orders, court orders, administrative orders on consent, or judicial consent decrees under CERCLA or Superfund
- Facilities that are subject to the jurisdiction, custody, or control of the U.S. government, including facilities owned by, or under the custody or control of, the federal government.

BROWNFIELDS IN TAMPA



SUPERFUND SITES IN TAMPA



Early and Continued Community Engagement

- Meetings
- Social Media
- Volunteer events
- Markets or festivals



Public Participation

❖ “Public participation” are activities that:

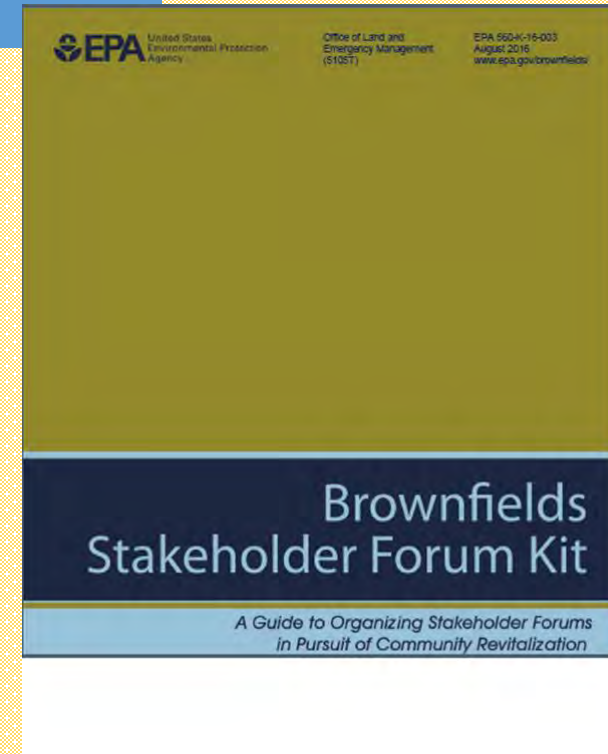
- Encourage public input and feedback;
- Encourage a dialogue with the public;
- Provide access to decision makers;
- Incorporate public viewpoints and preferences; and
- Demonstrate that those viewpoints and preferences have been considered by the decision makers.



Working with a variety of community members, local planners, elected officials, and other stakeholders is an effective way to identify and integrate long-term community needs into reuse plans for the site

Helpful Guide: How to Plan Effective Stakeholder Forums

- ❖ Preparing Stakeholder Workshops using EPA's Brownfields Stakeholder Forum Kit
 - A guide to assist communities in planning effective brownfields stakeholder forums.
 - Provides example agendas, invitations, logistics, and more, as well as other guidance to assist communities in engaging stakeholders and establishing partnerships to address brownfields revitalization challenges.



<https://www.epa.gov/brownfields/brownfields-stakeholder-forum-kit>

What does Brownfields Revitalization look like?



Brownfields Grants and State Programs

- EPA provides funding to all States thru annual cooperative agreement
- EPA encourages use of State programs
 - Our grants are seed money – need to leverage bigger \$\$
- States have Brownfields programs and/or Voluntary Cleanup Program (VCP) which can offer:
 - Oversight for voluntary assessment and cleanup of contaminated brownfields,
 - Significant liability protections,
 - Executed agreements,
 - Designated brownfields sites or areas,
 - Eligibility for economic incentives,

Brownfields: State/EPA Roles

- EPA Brownfields Project Officers manage the grant, review/approve workplans and QAPPs, and provide technical and revitalization assistance
- Florida DEP Brownfield project managers review cleanup plans, approve cleanups, and provide Site Rehabilitation Completion Orders
- Sites being cleaned up in the EPA Brownfields program follow Florida's cleanup authorities/requirements
- More sites get addressed under State programs rather than through EPA Brownfields grant program alone

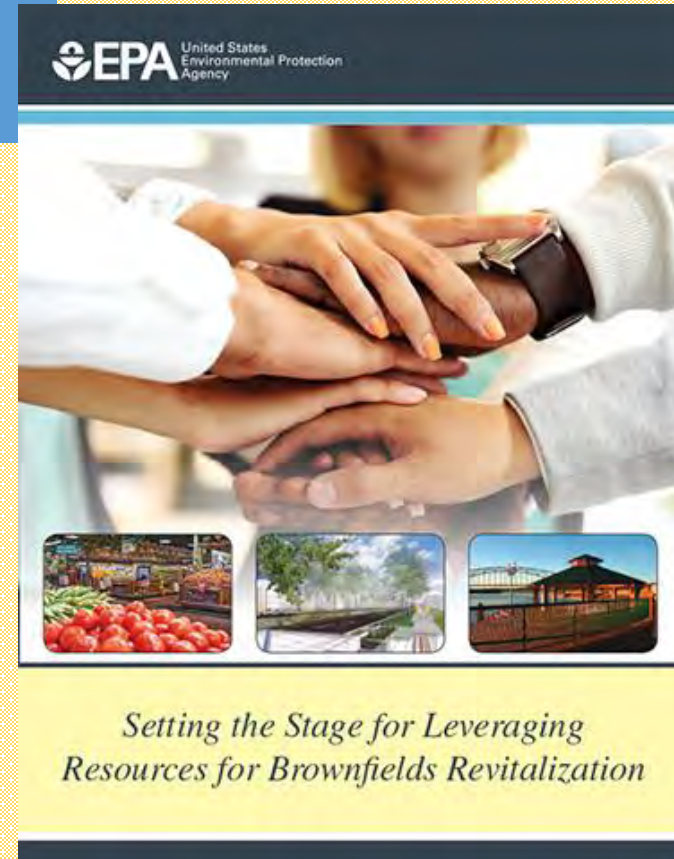


Helpful Guide: Leveraging

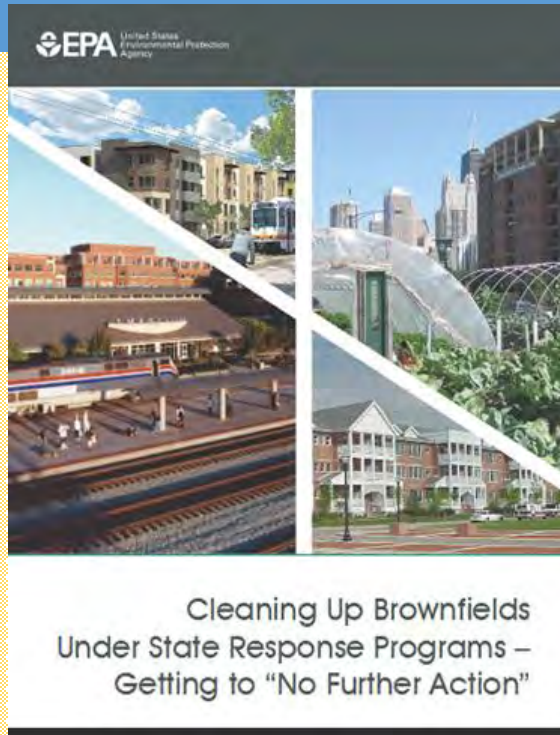
Successful grantees are assembling a package of funding from a variety of sources.

EPA Brownfields grants provide only a fraction of the funding necessary to clean up, prepare sites for development, and revitalize brownfields.

This guide, available online provides best practices for leveraging resources for brownfields and community revitalization.



Helpful Guide: State Response Programs



ALABAMA



Program Overview

The Alabama Department of Environmental Management's (ADEM) Brownfields Redevelopment and Voluntary Cleanup Program (VCP) provides oversight for the voluntary assessment and cleanup of contaminated brownfield sites. The greatest benefits of this fee-driven program are the significant liability protections afforded during and after assessment and cleanup activities.

The Alabama Land Recycling and Economic Redevelopment Act, signed on May 21, 2001, created the VCP. The ADEM Industrial Hazardous Waste Branch (IHWB) Redevelopment Section manages the VCP. The VCP allows innocent landowners to receive a limitation of liability for environmental contamination that occurred in the past. The liability protections are fully transferable to any non-responsible party who purchases the site, provided the party adequately maintains all land use controls.

All applicants—private industry, land developers, cities, counties, and the federal government—pay fees to enter the program. Submittal of the appropriate application fee is required prior to the review of any plans, reports, and/or certifications.

Certification of Compliance—Letter of Concurrence

To qualify for a limitation of liability, an applicant must not be a responsible person, i.e., “any person who has contributed or is contributing to a release of any hazardous waste, hazardous constituent, or hazardous substance at a property,” at the qualifying property. When the applicant is an individual, the individual must not have a familial or business connection to the property, and if a corporation or other legal entity, the corporation must not be a current or former subsidiary, division, parent, company, or partner of a current owner, the employer or former employer of the current owner, or any responsible person on the subject property.

Certain types of sites are not eligible:

- Sites subject to ADEM permitting requirements as hazardous waste treatment and storage facilities.
- Superfund sites on the National Priorities List.
- Sites currently under an administrative order for cleanup by either ADEM or EPA.

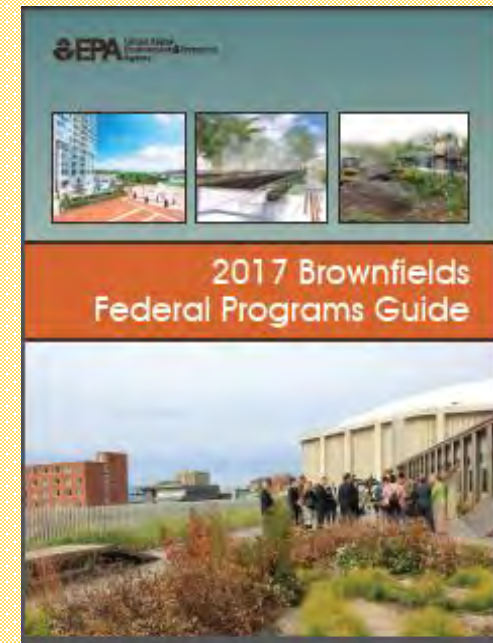
VCP Process Summary

- The applicant requests a pre-application meeting with ADEM (optional).
- The applicant obtains a Letter of Eligibility for the property from IHWB.
- The applicant submits an application, supporting documents, and an application fee.
- The applicant submits for approval a site voluntary property assessment plan, with fee.
- The applicant submits a report of the assessment process and its findings.
- The applicant considers impacts to human health and the environment and determines cleanup levels, with IHWB concurrence.
- The applicant submits a voluntary cleanup plan for the site, with fee.
- The applicant conducts site activities as specified in the approved cleanup plan.
- The applicant submits a Certification of Compliance (with fee) when all requirements of an approved cleanup plan are complete, or upon completion of an assessment based on an approved voluntary property assessment plan with no contamination discovered.
- IHWB approves the applicant's Certification of Compliance and issues a Letter of Concurrence or a Conditional Letter of Concurrence.

42 | Cleaning Up Brownfields Under State Response Programs – Getting to “No Further Action”

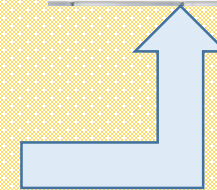
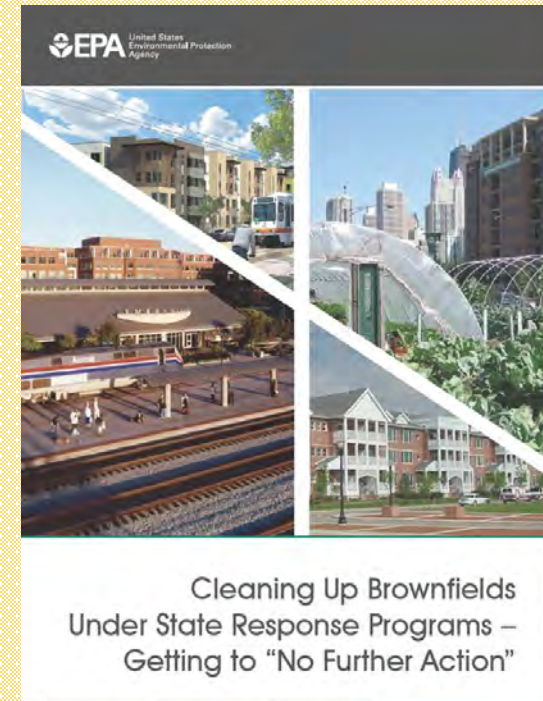

Helpful Guide: The Brownfields Federal Programs

- This guide is intended to help local governments, nonprofit organizations, and other entities involved in brownfields redevelopment navigate the web of financial and technical assistance available from the federal government.
- It is a compendium of the technical assistance and financial resources available from federal agencies for brownfields and land revitalization projects.



Resources

- Find Brownfields in your community (received federal \$\$)
<https://www.epa.gov/cleanups/cleanups-my-community>
- EPA Region 4 Brownfields program
<https://www.epa.gov/brownfields/brownfields-and-land-revitalization-alabama-florida-georgia-kentucky-mississippi-north-0>
- Interactive Brownfields Road Map:
<https://brownfieldstsc.org/roadmap/roadmapclick.cfm>
- State Programs
<https://www.epa.gov/brownfields/cleaning-brownfields-under-state-response-programs-getting-no-further-action>



EPA REGION 4 BROWNFIELDS SUCCESS STORIES



- **Brownfields Success Stories** (*blue pushpin*) and **FY08-FY17 Completed Cleanups** (*green dot*) highlight the accomplishments of EPA Brownfields grantees in EPA Region 4.
- Transforming brownfields into thriving new centers of commerce and industry
- Creating jobs through cleanup and reuse
- Formatting innovative partnerships among federal, state, and local governments and private-sector stakeholders such as developers and lenders



Brownfields Assessment Grant: Louisville, KY - *Central Rail Corridor, Historic Incinerator Building Assessment*

- Existing conditions assessment
- Architectural & engineering review
- Historic resource evaluation
- Reuse alternatives



OFFICE OF BROWNFIELDS AND LAND REVITALIZATION

AYCOCK CORNER

- Former gasoline station and repair shop in Downtown Millen, GA.
 - Potential redevelopment hampered due to the small size of the property and presence of known fuel USTs.
 - 2006 Brownfield Assessment Grant
 - 2010 Brownfield Cleanup Grant
 - GDOT National Scenic Byways Grant
-
- Leveraged \$667,000 for construction of Scenic Byways Visitor Center from DOT, in addition to the City's \$166,000 cost share commitment.

