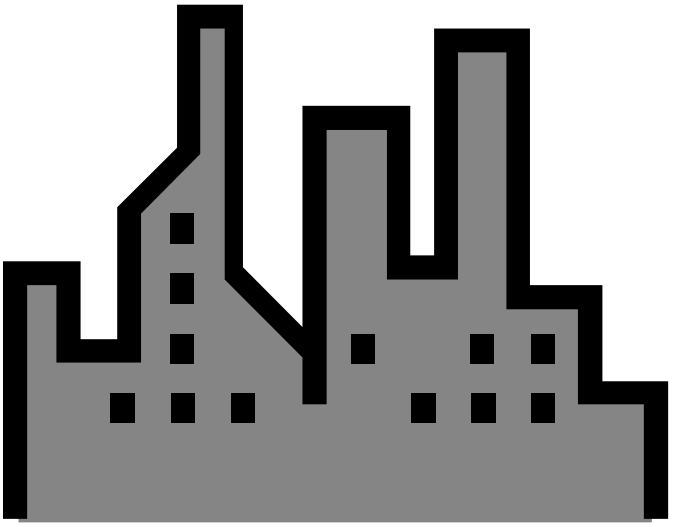
BROWNFIELD REDEVELOPMENT:

A Resource Guide for Toledo and Other Ohio Governments, Developers, and Communities



A report for the

URBAN AFFAIRS CENTER
The University of Toledo

By

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August 2001

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Acknowledgements

I gratefully acknowledge the financial support of The University of Toledo's Urban Affairs Center for this project. I very much appreciate that the Chair of the Department of Geography and Planning, Dr. Sam Attoh, agreed to release me from teaching a course so that I could complete this research during spring 2001. I would also like to thank Dr. Patrick McGuire, Director, Urban Affairs Center, for his constructive feedback on the first draft of this report.

BROWNFIELD REDEVELOPMENT IN THE TOLEDO METROPOLITAN REGION: CHALLENGES AND OPPORTUNITIES

1. Introduction

This report is a comprehensive review of the most important issues involved in brownfield redevelopment in the Toledo metropolitan region of Ohio. It is intended primarily to be a practical source of current information rather than a policy document. The report is designed as a single accessible source of information for public, private, and community groups and individuals who are attempting to overcome the obstacles, and take advantage of the opportunities, created by brownfields.

Brownfields are "abandoned, idled, or underutilized industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived contamination." Using this U.S. Environmental Protection Agency (USEPA) and Department of Housing and Urban Development (HUD) definition, a tremendous number of sites can be characterized as brownfields. This is because the actual severity of contamination is not specified and the environmental problems can be merely suspected as well as actually documented.

Most brownfields are in cities, like Toledo, that have a history of traditional industry. These sites can be abandoned manufacturing or warehousing facilities or currently operating plants and railroad yards that show signs of pollution. Certainly, many communities have contaminated landfills, but brownfields can also be commercial properties like old dry cleaners or gas stations with leaking underground storage tanks. Brownfields can even be residential lots with only suspected contamination from a former use.

While the City of Toledo contains the majority of brownfields in this region, some contaminated sites are also found in adjacent municipalities within Lucas County, such as Oregon and Swanton. The municipalities that form this contiguous built-up urban region together comprise the Toledo metropolitan region of Ohio. That part of the metropolitan region that extends into Monroe County is excluded from the discussion in this report because the legislative and regulatory situation in Michigan is quite different to that in Ohio.

600 Bassett Street, Toledo — Maumee Refining Inc., a.k.a. Schachner Site
The owner of the Bassett Street Warehouse was convicted of operating a hazardous waste treatment, storage, and disposal facility without a permit, falsifying manifest information, lack of waste analysis, and inadequate record-keeping. The Ohio Environmental Protection Agency (OEPA) found 338 (18,590 gallon) drums of waste—with urethane, plasticizer, organosol, plastisol, paint, oil-based paints, tri-chrome blue, and acid cleaner—stored in a potentially hazardous manner in deteriorating containers. Some hazardous material was removed in 1992 but the site remains an OEPA hazardous waste site. After trying to sell the site in 1999, the owner let it revert to the City as part of a settlement over unpaid taxes.
Source: City of Toledo (1996) *Lucas County Contaminated Sites Directory*.

While most brownfields are not as badly contaminated as the Bassett Street Warehouse, they nevertheless present challenges and opportunities for city and county governments, local businesses and investors, and neighboring and regional communities. Redevelopment of these sites creates multiple challenges associated with legal liability for cleanup and damage, complicated regulatory requirements by environmental and land use regulators, environmental contamination and cleanup, and the availability of financing for redevelopment.

Brownfield reuse, however, also offers considerable opportunities that can produce positive environmental, economic, public safety, and neighborhood revitalization benefits. Brownfield redevelopment can help improve the environmental and economic health of area residents, especially those people living near brownfields. For the private sector, brownfield redevelopment creates the potential for profit from a large under-exploited source of land in established communities (Black, 1994; Gibbons *et al*., 1998; Simons, 1998). The public benefits of brownfield reuse, estimated in the US Conference of Mayors (2000) survey of 231 cities, include more than 550,000 new jobs and up to $2.4 billion annually in additional tax revenues.

The opportunity to achieve these kinds of benefits has drawn the public's attention to brownfield redevelopment in the last few years in Ohio. Most recently, in November 2000, Ohio voters approved Issue 1, a constitutional amendment that empowers the state to borrow and spend $200 million to cleanup up brownfields. Clearly, much more than $200 million is needed to address the problem of brownfields in Ohio. Nevertheless, voter and state legislature approval of Issue 1 reflects the increasing importance assigned to brownfield redevelopment on the part of the state government and the public in Ohio.

The next section of this report identifies the number of brownfields that have been estimated or inventoried at a number of spatial scales—United States, state of Ohio, Lucas County, and City of Toledo. Section 3 outlines the benefits to be gained from brownfield reuse. Section 4 describes the seven-stage process for brownfield redevelopment. Section 5 discusses the redevelopment prospects of these sites. Section 6 addresses legal liability at federal and state levels for environmental contamination and damage. Section 7 covers regulatory and institutional issues that can impede brownfield reuse. Section 8 focuses on environmental contamination and remediation. Section 9 addresses the issue of financing cleanup and redevelopment. The report concludes by drawing attention to the need for connecting brownfield redevelopment to broader community goals. At the end of the report is a list of key information sources on brownfield remediation and redevelopment.

2. How Many Brownfields Are There?

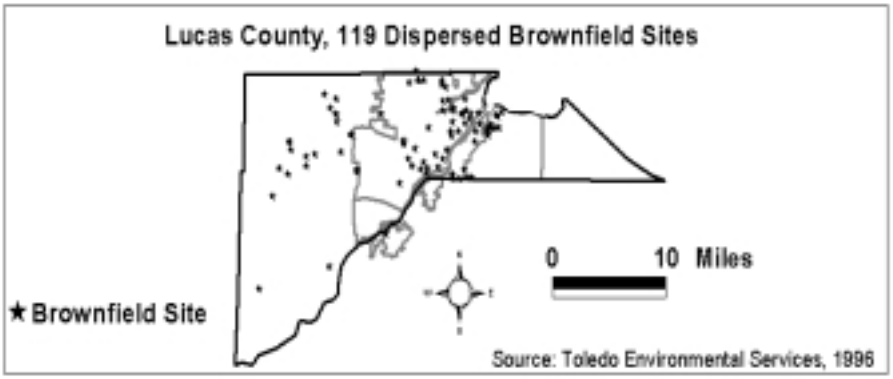
No one knows exactly how many brownfields there are. A variety of sometimes conflicting estimates and inventories exist at the national, state, county, and local government levels. At the federal level, HUD estimates that there are 425,000 brownfields, representing about 5 million acres—equivalent to the combined land area of 60 of the country's largest cities! The USEPA estimates that more than 500,000 sites have a strong potential for contamination. Of these, about 1,300 are the worst hazardous waste sites—on the USEPA's Superfund National Priorities List of properties that warrant federal action. Thirty-one of these toxic sites are found in Ohio, although none are located in the Toledo metropolitan region. Most brownfields have only low to medium levels of known or suspected contamination, however, with much of it from ordinary (non-hazardous) waste. These brownfields are the responsibility of the state level of government because they are not contaminated enough to warrant federal action.

At the state level, the USEPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) inventory contains the worst hazardous waste sites in Ohio. These brownfields are under consideration for inclusion in the USEPA's Superfund National Priority List. Of these 1,391 CERCLIS brownfields in Ohio, 257 properties are a priority for investigation and cleanup—14 of these sites are located in the Toledo metropolitan region, with the vast majority, 12, found in the central city of Toledo (see *http://www.epa.gov/superfund/sites/cursites/ohccnty.htm#lucas*).

USEPA CERCLIS Inventory of the Worst Hazardous Waste Sites in the Toledo Metropolitan Region of Ohio (June 2001)

Bassett Street Warehouse	600 Bassett St.	Toledo
Detroit Lead Battery Recyclers	5715 Angola Rd.	Toledo
Dura Ave. Landfill	Dura Ave.	Toledo
Impact Stamping	5511 Telegraph Rd.	Toledo
Manhattan Dump	2020 Manhattan Blvd.	Toledo
Owens-Illinois Libbey Plt 27	940 Ash St.	Toledo
Stickney Ave. Landfill	3900 Stickney Ave.	Toledo
Toledo Plate & Window Glass	1042 Utica St.	Toledo
Toledo Tie Treatment Plant	Arco Ind. Park S., Frenchmen's Rd.	Toledo
Treasure Island/Manhattan Dump	2020 Manhattan Blvd.	Toledo
Tyler Street Dump	Tyler St.	Toledo
XXKEM Co. Inc./Oberly Robert Waste	3903 Stickney Ave.	Toledo
Commercial Oil Service Inc.	3600 Cedar Point Rd.	Oregon
Griswold Site	10745 Old Stateline Rd.	Swanton

At the level of the Toledo metropolitan region, the City of Toledo Environmental Services Division compiled the *Lucas County Contaminated Sites Directory* in 1996. It identified 119 brownfields dispersed throughout the county, with the majority located in the central city of Toledo. This inventory, however, has lost much of its usefulness because it has not been updated since 1996.



Drawn by Jim Coss, Department of Geography, The University of Toledo

At the level of the City of Toledo, the City of Toledo's Brownfields Group has almost completed its inventory. The compilation of this list of brownfields was funded by a pilot grant from the USEPA. It contains 54 sites (when completed, this inventory will be available at *http://www.ci.toledo.oh.us/index.cfm?Dept=Dept13Nav&Page=Page272*).

Nine of the sites included in the City of Toledo's Brownfields Group inventory are on the USEPA's list of the 12 most hazardous waste sites in Toledo. Seventeen of the properties on the City of Toledo's Brownfields Group inventory, however, are on the USEPA's No Further Remedial Action Planned (NFRAP) list of 41 Toledo sites. The USEPA has already delisted these sites because, after investigation, no contamination was found, contamination was removed quickly without the need to place these sites on the National Priorities List, or the contamination was not serious enough to warrant federal action.

City of Toledo's Brownfields Group Brownfield Site Inventory (June 2001)			
Name	Address	CERCLIS	NFRAP
Arlington Ave. Landfill	SW Detroit & South		
Autolite	1205 Champlain		
Bartley Place	826 Bartley		
Bassett St. Warehouse	600 Bassett St.	X	
Champion Spark Plug	1110 Hastings		
City of Toledo tax forfeited warehouse	3053 Monroe St.		
Clark Station #1783	750 E. Central Ave.		
Cleveland Metals	2351 Hill Ave.		
Columbus Street Dump	Columbus St.		
Consaul Street Landfill	2510 Consaul St.		X
Consolidated Rail	Emerald Ave.		
Cooks Building	3111 Buckeye St.		
Detroit Lead Battery Recyclers	5715 Angola Rd.	X	
Dial Corp.	6120 N. Detroit Ave.		X
Doehler Jarvis (old)	1825 Smead		
Dunright Mobile	1805 E. Manhattan		
Dura Ave. Landfill	Dura Ave.	X	
Erie Coatings & Chemical Inc.	602 S. Hawley St.		
Essex Group Inc.	5101 Telegraph Rd.		X

Name	Address	CERCLIS	NFRAP
Garrison	1515 W. Bancroft		
Gulf Oil Refinery (Chevron)	2935 Front		X
Bobby Howard	37-39 Blucher		
Impact Stamping	5511 Telegraph Rd.	X	
Jennison-Wright Corp	2332 Broadway Ave.		
Koppers Co. a.k.a. Beazer East	2563 Front		X
Libbey-Owens-Ford Plts 4 & 8	1701 Broadway		
Manhattan Dump	2020 Manhattan Blvd.	X	
Matlack Trucking Co.	1728 Drouillard Rd.		X
Middlegrounds [Owens Corning HQ]	Washington & Ottawa		
Mulberry Street Landfill	1100 Elm St.		
NL Ind./Doehler-Jarvis a.k.a. Farley Metals	5400 N. Detroit Ave.		X
NL Ind. Inc. Bearings Div.	715 Spencer		X
North American Car Corp	4545 Hoffman		X
North Cove Landfill	Drexel Dr./I-75 & Cove		X
Oberly Ray Disposal	3812 Twining St.		X
Old Chevrolet Transmission Plant	900 W. Central		
Penn Central Transport a.k.a.	435 Emerald Ave.		
Phillips Petroleum Property	275 Millard Ave.		X
Plaskon	2829 Glendale Ave.		
Royster Co. a.k.a. Stickney West Ind. Park	4401 Creekside Ave.		X
Sheller-Globe	Dorr E. of Westwood		
Sheller-Globe Corp. Armored Plastics	Lint & Dura Ave.		
Stickney Ave. Landfill	3900 Stickney Ave.	X	
Texileather Corp.	3729 Twining		X
Toledo Coal Gas Plant Columbia Gas	S. Erie St.		
Toledo Edison Co. Acme Gen. Station	1401 Front St.		X
Toledo Edison Fly Ash Ponds	Longdale & Seaman		
Toledo Powdered Metal	Cross St.		X
Treasure Island/Manhattan Dump	2020 Manhattan Blvd.	X	
Tyler Street Dump	Tyler St.	X	
Unitcast	E. Broadway		
West South Ave. Dump	South & Kuhlman		
Westbrand Corp	526 Hamilton St.		X
XXKEM Co. Inc.	3903 Stickney Ave.	X	

The lack of complete correspondence between the inventories of brownfields that have been compiled by the USEPA and the City of Toledo's Brownfields Group reinforces the fact that no list of sites can be exhaustive or even completely up-to-date. Discrepancies will occur because of incomplete knowledge about contamination at some properties. More sites will be delisted after investigation and cleanup. Additional ones will be added as further old industrial properties fall out of use and information comes to light about other sites.

Certainly, it is important for governments at all levels to maintain inventories of sites and to achieve database integration between different sources. This kind of accurate and up-to-date information can help the public sector to promote the redevelopment of these sites by allowing developers to find suitable sites for remediation and reuse. The next section of this report examines the public and private benefits of brownfield redevelopment.

3. The Benefits of Remediation and Redevelopment

Brownfields represent a large untapped resource for land development in already established communities (Bartsch & Collaton 1997; Black 1994; Gibbons *et al*. 1998; Lerner 1996; Meyer & van Landringham 2000; Simons 1998). The redevelopment of these sites creates opportunities for both the public and the private sectors.

Brownfield remediation and reuse can provide numerous benefits for the public sector and community by promoting:

- increased private-sector investment at the site itself and in the immediate area of the site;
- higher tax revenues from the increased economic activity at the site and its immediate area;
- job creation in the firms that remediate the site, in the new businesses that are then established at the site, and in those organizations providing goods and services to the new companies;
- better environmental quality—of the land, water, and air—after the site has been remediated;
- better public health when contaminated sites are remediated;
- improved public safety when vacant and derelict sites are redeveloped;
- neighborhood revitalization from the activities of people and businesses at or near the site;
- renewal and reuse of existing, often underutilized, municipal infrastructure and services; and
- reduced urban sprawl at the edge of the built-up area because of more central city redevelopment—reducing automobile use and traffic congestion with benefits for environmental quality and economic development in the region, while helping to preserve "greenfields" of farmland, woodland, and wetlands at the urban periphery that would otherwise be developed.

For the private sector, brownfields offer redevelopment opportunities due to the:

- new business activity for the real estate community associated with redeveloping sites that are strategically located within central parts of the urban area;
- new business potential for lending institutions;
- financial returns on properties that have been dormant;
- proximity to the downtown business district and its service, supply, and distribution firms;
- access to untapped consumer markets—HUD (2001) estimates conservatively that the annual retail purchasing power of central city residents is $665 billion, with as much as $85 billion annually being accounted for by the households in the most economically distressed neighborhoods;
- convenience to a large, moderately priced labor force in the immediate area and to a regional labor pool that depends on a well-developed public transportation system; and
- availability of public incentives for site assessment, remediation, and redevelopment.

Owens Corning World Headquarters — former Middlegrounds site
This old railroad yard was the City of Toledo's first major brownfield project—it contained a roundhouse for the engines, abandoned buildings, and underground storage tanks. An oily sheen was discovered during excavations for a condominium development in 1988. Remediation and redevelopment in 1994 involved demolishing the roundhouse and abandoned buildings, relocating the condominiums, and removing two diesel tanks and a heating oil tank. Now, as the Owens Corning world headquarters, this site provides economic benefits for the City, its workers, and residents.
Source: City of Toledo (1996) *Lucas County Contaminated Sites Directory*.

Success stories like the Owens Corning world headquarters site drive home the message that brownfields that remain idle represent a loss of economic activity, jobs, and tax revenues for the local and regional community. The next section of this report describes the seven-stage process for returning brownfields to productive uses.

4. Seven-Stage Process for Brownfield Redevelopment

Achieving the redevelopment of brownfields involves a seven-stage process (USEPA 2001).

1) Site Identification: Develop and maintain a registry of sites, advertise and market abandoned properties, and help developers to find suitable sites.
2) Initial Site Assessment (Phase 1 Investigation): Review public records, physical surroundings, and other readily available data for the site.
3) Economic Assessment: Evaluate site characteristics and compare to Phase 1 Assessment to see if the site is currently viable (the private market is already working towards redevelopment without public assistance), potentially viable (redevelopment requires some public assistance), or non-viable (redevelopment requires substantial public assistance).
4) Detailed Site Assessment (Phase 2 Investigation) (if needed): Environmental engineering investigation, sampling, and chemical analysis of the site.
5) Project Development and Finance: Perform financial feasibility studies, develop financing plan for cleanup and redevelopment, and arrange financing—involves meetings with lenders, insurers, realtors, project partners, and nearby communities.
6) Cleanup Planning and Execution: Select and implement a cleanup approach—can involve high capital costs of remediation, public notices, and reports for regulators.
7) Site Redevelopment: Clearance/demolition, new construction, alteration/reuse to suit the new use for which the property is being redeveloped.

This seven-stage process requires the active involvement of a range of participants from public, private, and nonprofit bodies, as well as from the community. Successfully negotiating this seven-stage redevelopment process, however, involves very profound challenges presented by the poor redevelopment prospects of some sites. This issue is outlined in the next section of this report.

5. Redevelopment Prospects

Aside from whether a brownfield is badly contaminated or not, some of these properties have weak redevelopment prospects because of their site characteristics (Bartsch & Collaton 1997; Gibbons *et* al. 1998; Hanley 1995).

- Brownfields are often small. Many are less than the average of three to five acres needed for modern industrial sites (Simons 1998). Assembly of adjacent parcels can be expensive and time-consuming for a private company.
- The relative utility of the existing buildings on a site can raise problems in terms of the cost and time of removing obsolete structures and completing site improvements.
- While brownfields offer a central location, access to some sites can be limited. Modern industrial facilities need to be on a truck route that connects to an interstate highway interchange that is less than half a mile or five minutes away. Commercial activities, like retail establishments, need to be near the intersection of two major streets (Simons 1998).
- A high tax burden on the property or site activities can impede redevelopment.
- Tax delinquent sites with little or no market value can be low on government lists of marketable sites, yet nearby communities would benefit greatly from cleanup and reuse.
- A negative image due to the actual and perceived quality of the immediate area—especially in terms of criminal activity—can be an obstacle to redevelopment.
- The availability and cost of insurance can be a problem. Crime, property, and liability insurance before, during, and after redevelopment can be costly and difficult to obtain.

In addition to having weak development prospects due to site characteristics like small size or poor location, many sites remain idle because of concerns about legal liability for environmental contamination and damage. Legal liability issues are addressed in the next section of this report.

6. Legal Liability

Concern about legal liability can be a major impediment to brownfield redevelopment (Bartsch & Collaton 1997; Black 1994; Greene 1996; Hanley 1995; Lerner 1996; Simons 1998). This relates to uncertainties about whether environmental contamination exists at a site, and if so, to what extent non-responsible parties, such as potential developers and lenders, may be liable for cleanup and environmental damage to the federal and state governments, or to a private third party involved in the cleanup and redevelopment activities at the site, or to someone that may be harmed by contamination from the site. Much of this section of the report addresses the issue of legal liability for cleanup and damage under federal and state laws. This section concludes by briefly addressing the general issues of liability for third-party claims, and the option of environmental risk insurance.

Legal liability under federal laws

Four federal laws, in particular, directly impact brownfields and their redevelopment. These are 1) the Comprehensive Environmental Response, Compensation, and Liability Act, 2) the Resource Conservation and Recovery Act, 3) the Toxic Substances Control Act, and 4) the Oil Pollution Act. Liability may be imposed under these laws even if a party, such as a person or firm who just bought the property, was not at fault for any of the environmental releases or spills at the site. Following a description of each these four federal laws, a fifth section outlines some recent changes in federal laws and policies in order to show how the national government is attempting to address liability concerns that represent a barrier to brownfield redevelopment.

1) The Superfund program: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

This 1980 federal law, popularly known as the Superfund program, governs liability for, and cleanup of, badly contaminated sites. The federal Superfund program was enacted to tackle the worst hazardous waste sites, where contamination poses serious environmental and health risks to the surrounding community (USEPA 2001).

Hazardous Waste	Ordinary Waste
Hazardous waste is ignitable, corrosive, or reactive (explosive). Waste that exceeds certain amounts of toxic chemicals is considered hazardous. The USEPA defined 500 specific wastes as hazardous. These include heavy metals like lead and mercury, radioactive substances including highly toxic radionuclides like plutonium-239, or organic chemicals with toxic properties, like the heavily chlorinated hydrocarbon DDT.	Ordinary waste is not specifically classified as hazardous. Ordinary waste is defined by the USEPA as any garbage, refuse, or sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material including solid, liquid, semi-solid, or contained gaseous material from industrial, commercial, mining, and agricultural operations, and from community activities.

The National Oil and Hazardous Substances Pollution Contingency Plan established the National Priorities List—currently about 1,300 of the most contaminated Superfund sites nationally, including 31 properties in Ohio, that have the highest priority for cleanup.

The identification of a site for the National Priorities List is intended primarily to guide the USEPA in:

- determining which sites warrant further investigation to assess the extent of the human health and environmental risks;
- identifying what Superfund-financed remedial actions may be appropriate;
- notifying the public about sites that warrant further investigation; and
- serving notice to potentially responsible parties that the USEPA may initiate Superfund-financed remedial action.

The USEPA's Superfund site tracking system is the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). In addition to the National Priorities List sites, CERCLIS includes an inventory of about 11,300 hazardous waste sites nationally that are possible candidates for the National Priorities List. These CERCLIS sites include the 258 worst hazardous waste sites in Ohio.

The Comprehensive Environmental Response, Compensation, and Liability Act enabled the 1982 revision of the National Oil and Hazardous Substances Pollution Contingency Plan. This Plan implements the federal Superfund program by providing the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. Two kinds of response actions are authorized:

1) short-term removals where actions to address releases or threatened releases require a prompt response; and
2) long-term remedial response actions at National Priorities List sites that permanently and significantly reduce the dangers associated with releases or threatened releases of hazardous substances that are serious, but not immediately life-threatening.

The Comprehensive Environmental Response, Compensation, and Liability Act established:

- prohibitions and requirements for closed and abandoned hazardous waste sites;
- a trust fund for cleanup, the Hazardous Substances Response Fund, when no potentially responsible party could be identified. $1.6 billion (raised from a tax on the chemical and petroleum industries) was authorized initially over five years to respond to releases or threatened releases of hazardous substances endangering public health or the environment; and
- liability for parties responsible for releases of hazardous waste.

The Comprehensive Environmental Response, Compensation, and Liability Act imposes liability when there is a release or threatened release of hazardous substances. Its "strict" liability provisions mean that wrong-doing does not have to be demonstrated. Even if the actual contamination was legal when it happened, a party may still be liable later for the

costs of cleanup and environmental damage. Liability is also "retroactive"—a party may be liable even if the pollution happened before the Comprehensive Environmental Response, Compensation, and Liability Act was enacted in 1980. This Act also assigns broad liability to ensure that all parties responsible for polluting are held accountable. "Joint and several" liability applies when there are a number of potentially responsible parties who may be responsible for all or part of the contamination (Bartsch & Collaton 1997; Page 1997; Page & Rabinowitz 1994). Potentially responsible parties include:

- present owners and operators of Superfund sites, even if they did not contaminate the property;
- past owners and operators of a facility where hazardous substances were disposed of improperly;
- parties who arranged for the treatment, disposal, or transportation for treatment or disposal of hazardous substances at a site; and
- parties who transported hazardous substances to disposal or treatment facilities that they selected.

The Comprehensive Environmental Response, Compensation, and Liability Act has been successful in addressing the worst environmental "hotspots" (USEPA 2001). It has:

- identified potentially responsible parties;
- facilitated more than 280 National Priority List cleanups; and
- coordinated about 2,000 emergency removals to address releases or threatened releases requiring a prompt response.

Yet the Comprehensive Environmental Response, Compensation, and Liability Act has discouraged environmental assessment and redevelopment at many sites, some of which have only low or even no contamination. This is because the federal law makes the current owners of sites potentially liable even if they were not responsible for the contamination. And while most brownfields will not be included in the National Priorities List and be subject to federal Superfund investigation and cleanup, the potential liability drives away developers, buyers, and lenders. Because there can never be absolute certainty about the amount of contamination at any site, every brownfield is a potential Superfund site with federal Superfund liability (Gibbons *et al*. 1998; Hanley 1995; Page 1997; USEPA 2001).

Historically, the USEPA maintained information about all sites reported as potential Superfund candidates. Sites were left on the CERCLIS inventory even when it was determined that no further federal Superfund interest was warranted. This added to the challenges of redeveloping these sites—they were "brownlined," automatically considered as risky propositions by lending institutions (Collaton & Bartsch 1996).

In the 1990s, in an effort to encourage brownfield redevelopment, the USEPA investigated and identified about 27,200 sites at the federal level as inappropriate for listing in CERCLIS. Designated as properties where there is No Further Remedial Action Planned, the information for these sites was archived. This archive contains those sites where no contamination was found, contamination was removed quickly without the need to place the

site on the National Priorities List, or the contamination was not serious enough to warrant federal action.

At the state level in Ohio, the USEPA archived 1,134 CERCLIS hazardous waste sites to its No Further Remedial Action Planned (NFRAP) list (*http://www.epa.gov/superfund/sites/arcsites/oharclst.htm*). The Toledo metropolitan region in Ohio contains 57 of these delisted sites, of which 41 are found in Toledo and 16 are located in adjacent parts of Lucas County (*http://www.epa.gov/superfund/sites/arcsites/ohacnty.htm#lucas*).

USEPA CERCLIS Archive of NFRAP Hazardous Waste Sites in Lucas County (June 2001)		
Acme/Borden	4243 South Ave.	Toledo
Allen Charles Waste Removal	Address unreported	Toledo
Ashland Oil Terminal (former)	3147 Jessie St.	Toledo
Bay View Water Reclamation Plant	Bay View Park	Toledo
Consaul Street Landfill	2510 Consaul St.	Toledo
Cousins Waste Management	2611 West Central	Toledo
Delaware Operations Center	1001 W Delaware Ave.	Toledo
Dial Corporation	6120 N Detroit Ave.	Toledo
Dupont E. I DeNemours a.k.a. Perstorp	Matzinger Rd. PO Box 6568	Toledo
Environmental Purification Industries	2111 Champlain St.	Toledo
Essex Group Incorporated	5101 Telegraph Rd.	Toledo
GMC Hydramatic Divivision	1455 W. Alexis Rd.	Toledo
Gulf Oil Co. Toledo Refinery (Chevron)	2935 Front St.	Toledo
Gulf Oil Toledo Terminal	2774 Front St.	Toledo
Herbert E. Orr Co.	3751 Lagrange St.	Toledo
Joe E. Brown Park Landfill	East side of Blanchard St.	Toledo
King Rd./Lucas Co. San. Landfill	3535 King Rd.	Toledo
Koppers Co. a.k.a. Beazer East	2563 Front St.	Toledo
Matlack Trucking Co.	1728 Drouillard Rd.	Toledo
Midland Ross Corporation	2375 Dorr St.	Toledo
NL Ind./Doehler-Jarvis a.k.a. Farley Metals	5400 N Detroit Ave.	Toledo
NL Ind. Inc. Bearings Division	715 Spencer St.	Toledo
North American Car Corporation	4545 Hoffman Rd.	Toledo
North Cove Landfill	Drexel Dr./I-75 and Cove	Toledo
Oberly Ray Disposal	3812 Twining St.	Toledo
Owens-Illinois Tech Center	1700 N Westwood Ave.	Toledo
Owens-Illinois Hilfinger	1800 N Westwood Ave.	Toledo
Phillips Petroleum Property	275 Millard Ave.	Toledo
Royster Co. Inc./Stickney West Ind. Park	4401 Creekside Ave.	Toledo
Sheller-Globe Corp. Auto Stamping	Lint and Dura Aves.	Toledo
South Cove Landfill	South Cove Blvd.	Toledo
Swan Creek Landfill	Glendale Ave.	Toledo
Tag Chemicals Inc.	100 Edwin St.	Toledo
Textileather Corpporation	3729 Twinning St.	Toledo
Toledo Blade Co.	541 N Superior St.	Toledo
Toledo Edison Co. Acme Generating Station	1401 Front St.	Toledo
Toledo Edison Co. Coke Oven Gas Line	Front and Cherry St.	Toledo
Toledo Powdered Metal	Cross St.	Toledo

Webstrand Corporation	525 Hamilton St.	Toledo
West South Ave. Dump	South and Kuhlman	Toledo
Willy's Park Landfill	North Cove Blvd.	Toledo
Andersons	439 Illinois Ave.	Maumee
Coulton Chem. Corporation	1400 Otter Creek Rd.	Oregon
Fondessy Enterprises	876 Otter Creek Rd.	Oregon
Gradel Landfill	Otter Creek Rd./Cedar Point Rd.	Oregon
Heist Cleaning Services	3804 Cedar Point Rd.	Oregon
M. Petty & Sons	Bayshore Rd.	Oregon
Safety-Kleen Corporation	161 Lallendorf St.	Oregon
Standard Oil Co. (Ohio)	Lallendorf and Cedar Point Rd.	Oregon
Sun oil Co. of Penn.	1819 Woodville Rd.	Oregon
Toledo Edison Co. Bay Shore Gen. Station	4701 Bay Shore Rd.	Oregon
Union Oil Co. Toledo Ref.	1840 Otter Creek Rd.	Oregon
Westover Corp. San Landfill	820-920 Otter Creek Rd.	Oregon
Schiller Mats & Reinforcements	6050 River Rd.	Waterville
Borden Chemical Print Ink Division	6725 Gilead St.	Whitehouse
Maston Septic Services	7202 Providence	Whitehouse
Sherman Drilling	Yale Rd.	Yale

2) Resource Conservation and Recovery Act (RCRA) (1970)

The Resource Conservation and Recovery Act may require a party who owns or operates a current or former hazardous waste treatment, storage, or disposal facility, or a facility containing underground storage tanks, to investigate and clean up contamination at that facility.

Congress amended Subtitle I of the Resource Conservation and Recovery Act in 1986—it wanted owners and operators of underground storage tanks to show that they have the financial resources to clean up a site if a release occurs, to correct environmental damage, and to compensate third parties for personal or property injury. The amount of coverage required for sites with underground storage tanks depends on the type and size of the business. Owners and operators have several options. They can:

- obtain commercial environmental impairment liability insurance;
- demonstrate self-insurance;
- obtain guarantees, surety bonds, or letters of credit;
- place the required amount into a trust fund that is administered by a third party; or
- rely on coverage provided by a state financial assurance fund—most states generate funds from tank registration and petroleum fees.

Subtitle I of the Resource Conservation and Recovery Act allows state underground storage tank programs that have been approved by the USEPA to operate in lieu of the federal program. Currently, 28 states have state program approval; none of the six states in USEPA Region 5 (which comprises Ohio, as well as Illinois, Indiana, Michigan, Minnesota, and Wisconsin) have such approval.

3) Toxic Substances Control Act (TSCA) (1976)

The Toxic Substances Control Act regulates toxic chemicals—including PCBs and asbestos—that are used in commerce but are not adequately covered by the Comprehensive Environmental Response, Compensation, and Liability Act or the Resource Conservation and Recovery Act.

PCBs (Polychlorinated Biphenyls)
PCBs are regulated chemical substances under the Toxic Substances Control Act that were used widely as heat-transfer agents in electrical equipment until the USEPA banned their manufacture in 1979. PCBs tend not to be very soluble and so they generally do not migrate or become dissolved, for example, in water. Because they are so persistent, many exposure routes must be considered: dermal exposure; ingesting contaminated soil; and inhaling contaminated air. Cleanup using excavation can create short-term exposure for workers and nearby communities from inhaling dust emissions. Chronic exposure of animals to PCBs can cause disrupted hormone balances, reproductive failures, teratomas, or carcinomas. The incomplete combustion of PCBs in thermal treatment processes can lead to polychlorinated dibenzofuran emissions—these have toxicological and lethal effects on laboratory animals.
Source: *http://copa.org/whoswho/pcbov.htm* (accurately catalogued June 2001)

4) Oil Pollution Act (OPA) (1990)

The owner or operator of a property from which there is an actual or threatened discharge of petroleum may be liable for cleanup under the Oil Pollution Act.

5) Recent changes in federal laws and policies

The U.S. Congress and the USEPA have made changes in federal laws and policies in an attempt to address liability concerns that deter private parties from becoming involved in brownfield reuse.

a) The U.S. Congress has enacted legislative changes to existing laws and enacted new laws.

i) The U.S. Congress enacted legislative changes to the Comprehensive Environmental Response, Compensation, and Liability Act and to the Resource Conservation and Recovery Act to clarify liability concerning a party's involvement with a brownfield.

ii) The U.S. Congress enacted the Asset Conservation, Lender Liability, and Deposit Insurance Protection Act in 1996. This Act established new federal statutory requirements that can insulate financial institutions and governmental entities from liability at contaminated properties. The Act defines the activities that lenders and governmental entities can undertake at contaminated properties without being liable under the Comprehensive Environmental Response, Compensation, and

Liability Act or the Resource Conservation and Recovery Act. Creditors who merely hold a security interest in a contaminated property, and governmental entities that foreclose on tax delinquent or demolition liens, are exempt from liability unless they become active managers of a property.

b) The USEPA has also acted under current laws to revise its policies in an effort to address the liability concerns of parties concerning previously-used sites. The USEPA has revised its policies in certain situations where federal and state standards do not correspond. The USEPA has worked with states and municipalities to revise its policies to provide, under specified circumstances, assurances that federal Superfund liability will not be a concern for prospective purchasers, lenders, and property owners involved in previously used properties. These revisions clarify liability concerning a party's association with and activities at a site, and declare the USEPA's decision not to use its enforcement discretion to pursue a non-responsible party for cleanup and damages at a site.

i) The USEPA revised its policies and outlined situations in which it may enter into an agreement not to file a lawsuit against a prospective purchaser of a property that was contaminated prior to purchase. A party who is interested in purchasing a contaminated property that is or may be subject to a cleanup action under the Comprehensive Environmental Response, Compensation, and Liability Act may be eligible to enter into a Prospective Purchaser Agreement with the USEPA. Under a Prospective Purchaser Agreement, the USEPA grants the prospective purchaser of a contaminated property a legally binding promise or Covenant Not To Sue (CNTS) for federal Superfund liability arising from contamination existing at the property prior to the date of purchase.

ii) The USEPA adopted a policy on the issuance of Comfort/Status (No Further Action) Letters. The USEPA wants to provide some level of "comfort" to parties that if they purchase, develop, or operate a contaminated property, the USEPA will take no further action—specifically, the USEPA will not pursue them for the costs of remediating contamination that resulted from a previous use. Most concerns can be addressed by providing information on the "status" of a particular property and an explanation of its relevance to the USEPA. This policy provides the USEPA's criteria for issuing No Further Action letters and contains four sample letter types:

- No Previous Federal Superfund Interest Letter—can be provided to parties when there is no historical evidence of federal Superfund involvement at a property;
- No Current Federal Superfund Interest Letter—can be provided when a property has been removed from the CERCLIS inventory of sites, deleted from the National Priorities List, or does not fall within the boundaries of a CERCLIS site;
- Federal Interest Letter—informs the recipient of the current status of federal involvement and highlights applicable federal Superfund policy or regulations;
- State Action Letter—can provide information about a site where the USEPA has deferred action to the state.

iii) The USEPA revised its policy towards owners of properties containing contaminated aquifers in 1995. The USEPA will agree not to sue property owners for groundwater contamination of an aquifer underlying their property if the owners did not cause or contribute to the contamination. In addition, the USEPA will consider providing protection to such property owners from third party lawsuits through a settlement that affords contribution protection.

iv) The USEPA's 1995 Underground Storage Tank Lender Liability Rule clarifies when a lender may be exempt from underground storage tank liability.

Legal liability under state laws

Federal laws and policies, and toxic Superfund sites like Love Canal in upstate New York, have garnered enormous national attention. Yet it is the states, rather than the federal government, that have responsibility for the vast majority of brownfields. This is because most sites are not contaminated enough to be listed on the National Priorities List or to warrant USEPA Superfund action.

Due to the fact that the Toledo metropolitan region of Ohio contains no National Priorities List sites, the investigation and cleanup of brownfields in this region is administered by the Ohio state office of the EPA (OEPA). Brownfields that are the responsibility of the OEPA in the Toledo metropolitan area include the 14 CERCLIS Worst Hazardous Waste Sites (listed on page 3 of this report). At the same time, however, state cleanups of contaminated sites (whether on the National Priorities List or not) are still governed by federal Superfund regulations (Bartsch & Collaton 1997; Hanley 1995; Ruben 1995).

The individual states vary in how they address the liability concerns of non-responsible parties (Gibbons *et al*. 1998; Greene 1996). The most common state responses, whether by recent legislative action or administrative interpretation of existing laws, are:

- Comfort Letters (No Further Action (NFA) letters);
- Certificates of Completion; or
- Administrative Orders or Agreements that include a Covenant Not To Sue.

The states traditionally focused their efforts on the most contaminated sites. Less contaminated sites that needed investigation and remediation had to wait. Without direct oversight from the state, no one could undertake a cleanup project at these less contaminated sites and be assured it would meet state environmental standards. State Voluntary Action (Cleanup) Programs (VAPs) were introduced so that private parties that wanted to redevelop a brownfield could voluntarily agree to investigate and clean up the contaminated site and receive some protection from future state enforcement action (Bartsch & Collaton 1997; USEPA 2001). More than 40 states, including Ohio, have a Voluntary Action Program.

But the Voluntary Action Programs only address potential liability for cleanup under state law—potential federal liability may remain at a site that has been investigated or cleaned up under a state Voluntary Action Program. The federal government, through the USEPA,

retains jurisdiction and authority to act and respond to actual or threatened releases of hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act or the Resource Conservation and Recovery Act. Thus, it is possible for a party to receive a Covenant Not To Sue from the state and be released from state civil liability, and still be subject to federal liability!

The USEPA does seek to allay fears that the government will bring a federal action against someone who appropriately investigates and remediates a property under a state Voluntary Action Program. To date, the USEPA has entered into Superfund Memoranda of Agreement (SMOAs) with individual states including Ohio, Illinois, Indiana, Michigan, Wisconsin, and Minnesota. At sites covered by state Voluntary Action Programs, the USEPA's Superfund Memorandum of Agreement signals that it does not anticipate a federal Superfund response action unless there is an imminent and substantial endangerment situation (Simons 1998; USEPA 2001).

The USEPA has also recently entered into a Resource Conservation and Recovery Act/ Toxic Substances Control Act Memorandum of Understanding (MOU) with Illinois that provides assurances similar to those in the Superfund Memoranda of Agreement but within the context of liability under the Resource Conservation and Recovery Act and the Toxic Substances Control Act. The USEPA is currently in discussions with other states to develop similar Resource Conservation and Recovery Act and Toxic Substances Control Act Memoranda of Understanding.

Ohio's Voluntary Action Program (VAP)

Ohio Senate Bill 221, 1994, created a program for voluntary cleanup and reuse—the Voluntary Action Program. The final rules allowing property owners, lenders, and developers to voluntarily investigate and remediate contaminated properties became effective in December 1996. Ineligible sites include those on the Superfund National Priorities List. Potentially responsible parties and non-potentially responsible parties, as well as prospective purchasers, are eligible.

Upon completion of the investigation and remediation according to the Voluntary Action Program rules, a private state certified site professional who worked on the site can submit a No Further Action letter on behalf of the owner to the OEPA. The No Further Action letter outlines the investigation and cleanup activities that were performed at the site. If the cleanup was done in accordance with the standards set out by the Voluntary Action Program rules, and following agency review and approval of the No Further Action letter, the OEPA will issue a Covenant Not To Sue, which releases current and future owners of the property from state civil liability.

The OEPA lists only four properties in Lucas County where a Voluntary Action Program No Further Action (NFA) letter has been issued and a Covenant Not To Sue (CNTS) is either pending or has been issued (see *http://www.epa.state.oh.us/derr/vap/nfa/nfa.html*).

OEPA Voluntary Action Program (VAP) Sites in Lucas County (June 2001)				
Property	Address	City	NFA issued	CNTS issued
City of Toledo-Goose Hill Site	I-280 & S Ketcham	Toledo	April 1997	Pending
Close Security Prison (Goose Hill)	2001 E Central Av	Toledo	April 1999	Pending
Lagrange Street/Herbert E. Orr	3751 Lagrange St.	Toledo	June 2000	Pending
Chevron	1200 York St.	Oregon	Dec. 1997	Dec. 1998

3751 Lagrange Street—a.k.a. Herbert E. Orr Company Site
Originally occupied by DeVilbiss Manufacturing, this site was purchased by Herbert E. Orr Co. in 1985 and operated as an electrophoretic paint deposition facility that processed metal stampings and forgings for the auto industry. The OEPA investigated in 1990 and found gross lead contamination of the soil in a relatively small area. Soil samples were collected in 1991 in preparation for a regulatory closure plan. Remediation included removal of a storage tank and surrounding contaminated soil. The OEPA site reinvestigation and soil samples in 1993 identified no immediately threatening environmental concerns. Occupied by Precision Cut-Off of Toledo, the site is on the USEPA's No Further Remedial Action Planned List and the City of Toledo Brownfields Group site inventory. A state Voluntary Action Program No Further Action letter was issued in June 2000, with a Covenant Not To Sue pending.
Source: City of Toledo (1996) *Lucas County Contaminated Sites Directory*.

The USEPA and the OEPA completed a Superfund Memorandum of Agreement (SMOA) in July 2001. Based on Ohio Revised Code (ORC) Chapter 3746 and Ohio Administrative Code (OAC) Chapter 3745-300, this agreement established a Superfund Memorandum of Agreement track in addition to the existing Ohio Voluntary Action Program track (described above).

The Superfund Memorandum of Agreement track is based on the existing Voluntary Action program track. It requires the property owner to following the existing procedures for Voluntary Action Program sites and to conduct several additional steps. A private state certified site professional is still used to follow the existing Voluntary Action Program procedures, including preparing the No Further Action letter. In the Superfund Memorandum of Agreement track, however, investigation and cleanup activities are overseen directly by OEPA personnel. It requires more OEPA involvement, such as notice of entry into the program and approval of certain documents and works plans. Sites taken through the Superfund Memorandum of Agreement track are, therefore, subject to more OEPA administrative review. There are also greater opportunities for public review of, and comment on, the documents pertaining to each site than in the existing Voluntary Action Program.

The Superfund Memorandum of Agreement track offers property owners the peace of mind of knowing that, once they are in receipt of a Covenant Not To Sue from the OEPA, the USEPA acknowledges that it will not bring a federal action against them if they have appropriately investigated and remediated a property under Ohio's Voluntary Action Program Superfund Memorandum of Agreement track. For the cleanup work on brownfields

that is conducted under this State Memorandum of Agreement track of Ohio's Voluntary Action Program, the USEPA acknowledges that it does not anticipate taking removal or remedial action under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 unless either the site poses an imminent and substantial endangerment to human health and the environment, or in cases where the OEPA finds it necessary to revoke the Covenant Not To Sue for a site.

Legal liability for third-party claims in the United States

One type of liability poses a particular concern for owners and prospective purchasers. At present, there is no legal mechanism at the federal or state level that completely insulates parties with an active participation in a brownfield redevelopment from potential liability for third parties who claim to have been injured by contaminants that originated at the site. Injured third parties can exercise legal rights under the federal Superfund or applicable state laws and seek damages or other remedies against the owner (Gibbons *et al*. 1998; Simons 1998).

Environmental risk insurance to address legal liability in the United States

There are three main kinds of environmental risk (Russ 2000):

- remediation-based risks associated with cleaning a site to meet federal and state laws and regulations;
- personal injury risks associated with contamination at the site; and
- property value impairment risks associated with contamination at the site that lowers the value of adjacent properties.

Environmental insurance can reduce the financial risk associated with brownfield properties (Bartsch & Collaton 1997; Gibbons *et al*. 1998; Meyer & van Landringham 2000; Russ 2000). Its utility, however, depends on the cost and scope of coverage. There are several kinds of environmental insurance that an owner, developer, or operator can purchase on the private insurance market:

- Environmental liability insurance:
  protects against third-party claims for off-site injuries, property value loss, property damage, and cleanup costs. This insurance covers, for example, the cost of cleaning up an adjacent aquifer that became polluted by contaminants that migrated off the site and into the water.

- Stop loss or cost cap insurance:
  protects against unexpected cleanup cost overruns by providing up to 200 percent of the initially estimated cleanup cost in insurance coverage. The insurance will cover the costs above some projected figure that has been established for each site. If the cleanup costs exceed this figure, the extra cost is paid for by the insurance company.

- Prospective liability and reopener insurance:
  protects against the cleanup cost of previously unknown contamination, for example, after receipt of a No Further Action letter. This insurance also protects owners or developers who have cleaned up a site to existing environmental regulation standards, but who find out later that they must remediate the site to even higher cleanup standards because of subsequent changes to federal or state environmental regulations.

- Owner-controlled insurance:
  protects against costs associated with the actions of others involved in a cleanup project. This insurance can protect an owner from liability for the medical and other costs for someone living nearby who suffers bodily harm and becomes sick as a result of being exposed to contaminants that migrated off the site and into the local drinking water as a result of the remediation activities of the environmental cleanup company.

The federal and state governments have made progress in addressing concerns about legal liability for cleanup and damage that can present barriers to brownfield reuse. In addition, environmental insurance is increasingly available on the private insurance market. In general, however, both legitimate and unfounded concerns about liability remain the greatest impediment to brownfield redevelopment in Toledo and other metropolitan regions in Ohio and the United States (Bartsch & Collaton 1997; Black 1994; Greene 1996; Hanley 1995; Lerner 1996; Simons 1998). This situation is not helped by the additional obstacles to brownfield redevelopment created by unnecessarily complicated and time-consuming public regulatory and institutional arrangements. This issue is addressed in the next section of this report.

7. Regulatory and Institutional Issues

Government regulatory and institutional arrangements can create obstacles for brownfield redevelopment. Complying with regulatory agency processes, at federal, state, and local levels, can involve substantial financial and time costs for developers and investors—for rezoning and other administrative reviews, approvals and entitlements, and other requirements by environmental and land use regulators.

Institutional issues that can make brownfield reuse difficult relate to the public provision of adequate information, such as on the extent of contamination or the availability of government funding for remediation and redevelopment. Public funding has been devoted to establishing local and state inventories of brownfields. Some of these databases, however, are not complete or accurate because ongoing financial resources are not available to keep them up-to-date. There can also be a lack of database integration between different sources.

Governments at all levels are attempting to coordinate their activities. The USEPA's Superfund Memoranda of Agreement are designed to harmonize federal and state cleanup and liability regulations. In 1996, the Federal Interagency Working Group on Brownfields was established as a forum for federal agencies to exchange information on brownfield activities and to develop a coordinated national approach to brownfield redevelopment. In addition, individual federal agencies, such as HUD's Office of Community Planning and Development and the U.S. Army Corps of Engineers, have entered into a memorandum of understanding (MOU) to coordinate their activities in support of brownfield redevelopment. The U.S. Conference Mayors (2000) survey of 231 cities indicated that 57 percent had city-state partnerships to address brownfield redevelopment, up from 51 percent in 1999.

An integrated and collaborative approach is seen increasingly as necessary for successful brownfield redevelopment. This involves local and regional public, private, and nonprofit/community organizations and individuals acting together, and working with state and federal governments. Because of the significant financial investment needed for assessment, cleanup, and redevelopment, many businesses have developed strategic alliances and partnerships—in addition to working with local, state, and federal governments, companies join forces with financial institutions and insurance firms.

Public participation in the agency review process is guaranteed in many states. Ohio Senate Bill 221, 1994, that established the state's Voluntary Action Program, requires public notice and hearings for proposed regulatory waivers so that community positions and concerns can be expressed. A public notice is published in the local newspaper to alert residents that a Covenant Not To Sue has been issued for a property. The public has the right to request any cleanup documentation from the OEPA. The private state certified site professionals who worked on a brownfield are required to retain documents pertaining to the cleanup for at least ten years (OEPA 2001).

Increasingly, active community involvement is seen as an asset in local and state efforts to redevelop brownfields. The residents in the immediate vicinity of these sites may be inherently qualified to make a valuable contribution to the redevelopment process. Adjacent

residents can contribute site-specific knowledge in the site assessment, workers trained for cleanup through government-sponsored programs, ideas for reuse, employees for the new businesses, and, depending on the reuse activity, a market for products and services (Bartsch & Collaton 1997; Greene 1996).

Moreover, nearby residents should be directly involved in decisions about the cleanup and reuse of a site because they have been most directly affected by its environmental and economic problems and will be impacted during and after site cleanup. The next section of this report addresses environmental contamination and the remediation of brownfields.

8. Environmental Contamination and Remediation

Many members of the private-sector commercial real estate industry do not view the redevelopment of contaminated sites as likely to return a satisfactory profit on their capital investment. Assessing the type and extent of environmental contamination, determining cleanup standards, and undertaking remediation are time-consuming—and time is money for developers. The process involves uncertainty—it can be difficult to gauge accurately in advance if remediation is necessary or the final cost of cleanup. There can be fears about escalating costs due to unforeseen cleanup expenses or changing environmental regulations (Bartsch & Collaton 1997; Black 1994; Gibbons *et al*. 1998; Greene 1996; Hanley 1995; Lerner 1996; Simons 1998).

For each site, the extent of contamination has to be assessed, cleanup standards need to be identified, and the remediation must be carried out.

Assessment of contamination

Environmental Remedial Investigation/Feasibility Study (RI/FS)
There are two phases in the Remedial Investigation/Feasibility Study for a potentially contaminated site. The Initial Site Assessment to identify suspected contamination can often be performed at relatively low cost using existing records, historical data, interviews with knowledgeable people, a site reconnaissance, and other readily available sources (Gibbons *et al*. 1998; Greene 1996; Page & Rabinowitz 1994; Russ 2000).

Initial Site Assessment (Phase 1 Investigation)
The Initial Site Assessment involves: • examining historical data to review old uses and applicable federal and state reports about hazardous substances on the property; • researching the chain of title and zoning history (to ascertain information about past owners, licensed activities, etc.); • inspecting similar information for neighboring sites; • looking for prior environmental audits and assessments, such as Occupational Safety and Health Administration (OSHA) safety reports, etc; • reviewing insurance policies for coverage of potentially-hazardous chemicals on site; and • checking with local revenue departments to ascertain whether hazardous substances fees or taxes were paid (indicating the potential use of hazardous chemicals on the site).

The Initial Site Assessment may indicate potential contamination. At this stage, some developers decide not to go ahead with a Detailed Site Assessment (Phase 2 Investigation) to determine the extent of contamination. This is because, depending on the severity of contamination and state regulations, a Detailed Site Assessment can be a more expensive investigation than the Initial Site Assessment. The public sector may need to become involved at this stage and provide financial incentives or actual assistance so that a Detailed Site Assessment is carried out (Greene 1996; Page & Rabinowitz 1994; Russ 2000).

Detailed Site Assessment (Phase 2 Investigation)

The Detailed Site Assessment involves two steps:

a) On-site assessment of the potential contamination of soil and structures using:
- environmental engineering (e.g. geophysical methods to find buried features like underground storage tanks);
- sampling; and
- chemical analysis.

b) Depending on the intended land use, a number of environmental and other conditions may need to be evaluated, such as:
- air quality and transportation congestion;
- likelihood of obtaining required permits;
- surface water quality;
- likelihood of obtaining direct discharge permits, and the pretreatment cost, if discharge into a public sewerage system is planned;
- drinking water quality;
- availability and cost of land filling demolition debris;
- availability, quality, and cost of water needed for industrial purposes;
- availability and cost of solid waste and hazardous waste disposal; and
- ambient noise and noise standards.

Cleanup standards

Determining the cleanup standards for a site is not straightforward. State standards may not correspond with federal Superfund standards, and standards differ from state to state. The broad discretion of state regulators under the Comprehensive Environmental Response, Compensation, and Liability Act means that the cleanup standards required for any site may not be immediately clear. The extent and cost of cleanup can be uncertain because state regulators have the power to require a cleanup to pre-contamination levels, or in some cases, to permit deviations from state-determined minimum levels. There is also the issue that, because of the overlap of federal and state laws, the USEPA can second-guess a cleanup conducted and approved by a state without a Superfund Memorandum of Agreement (Gibbons *et al*. 1998; Hanley 1995; Page 1997).

Federal cleanup standards

Contaminated sites that are remediated under the federal Superfund program must meet pre-established uniform generic concentrations known as “applicable or relevant and appropriate requirements” (ARARs) for the most common chemicals at contaminated sites. The Comprehensive Environmental Response, Compensation, and Liability Act includes a strong preference that the remediation actively eliminates or reduces the contaminants to the fixed corrective action level specified in the applicable or relevant and appropriate requirements (USEPA 2001).

These stringent federal Superfund standards may be appropriate for remediating heavily contaminated sites on the National Priorities List that are near residential areas where

uncontrolled human exposure is likely. But these standards may be unnecessary for the many brownfields that are not, or may not be, severely contaminated, or where human and environmental exposure can be limited by various means. But the Comprehensive Environmental Response, Compensation, and Liability Act provides little flexibility in these kinds of cases, and so a moderately contaminated site must be remediated to the same standard for a future intended use as a chemical factory as for a residential neighborhood (Hanley 1995; USEPA 2001).

State cleanup standards

In an effort to facilitate the remediation of contaminated sites—to help make cleanup more cost-effective for brownfields that are not on the National Priorities List—the USEPA published guidance documents covering risk-based corrective action (RBCA, pronounced "Rebecca") standards. The USEPA recognizes that, as long as human health and the environment are protected, there are advantages to allowing regulatory flexibility so that a developer can choose between proceeding immediately to meet *generic* risk-based concentrations (RBCs) or to undertake the more lengthy process of determining *site-specific* protective risk-based standards (Bartsch & Collaton 1997; Russ 2000).

1) Pre-established, generic, state-wide risk-based concentrations are deemed to be universally protective for industrial or residential conditions. These are based on conservative assumptions about those factors that may influence human and environmental exposure. Use of these cleanup standards can expedite cleanup because they minimize the necessity for site-specific data collection and analysis. The generic risk-based concentrations for some well-known chemicals are provided in the table below.

Generic Risk-Based Concentrations (RBCs) for Selected Chemicals

Chemical	Soil—Industrial mg/kg (milligrams per kilogram)	Tap Water µg/L (micrograms per liter)	Soil—Residential mg/kg (milligrams per kilogram)
DDT	0.200	1.90	17.0
Benzene	0.360	22.00	200.0
Beryllium	73.000	160.00	4,100.0
Chlorine	610.000	7,800.00	200,000.0

Source: Russ 2000; USEPA 2001.

1) Site-specific cleanup standards may be preferable for some sites where it may be more cost-effective to collect and analyze site-specific data and establish site-specific cleanup levels based on the particular exposure and risk at that site.

The USEPA uses the American Society for Testing and Materials (ASTM) risk-based corrective action process as a model framework for states that are establishing site-specific risk-based cleanup programs. The American Society for Testing and Materials risk-based

corrective action framework provides an assessment approach in which the necessary protective cleanup standards for each site are determined by the level of risk of developing cancer or other health problems. Human exposure is assessed based on the quantity of contaminants likely to reach the population at or near the contaminated site, and on toxicity based on the contaminant intake level that could impair health (Bartsch & Collaton 1997; Greene 1996; Page 1997; Russ 2000).

Where appropriate, the risk-based corrective action assessment approach can:

- substitute, for prior, conservative default, assumptions based on data that characterize the specific soil, geologic, and hydrologic conditions of a site;
- consider the probable fate and transport of the contaminants at the site relative to the probable pathways by which the public would be exposed to these contaminants; and
- take account of the probable future use of the site.

Use of the risk-based corrective action approach allows the Remedial Investigation/ Feasibility Study to be focused on developing practicable and cost-effective remediation activities that are consistent with the level of risk and the reasonably anticipated future land use on a site-specific basis—for example, less stringent for industrial reuse versus residential reuse.

OHIO Voluntary Action Program (VAP):
The Ohio Voluntary Action Program establishes that cleanup must protect public health and the environment. Generic numerical cleanup standards apply based on whether the future use of the site will be industrial, commercial, or residential. There are numerical standards for soil and unrestricted potable (drinkable) groundwater.

Some sites have contamination for which no standards have been established or where a private state certified site professional determines that the cleanup can be better carried out using site-specific cleanup standards. In these cases, risk-based corrective action can be used based on reasonable distinctions among the levels of risk at each site depending on the severity of contamination and the likelihood of human or environmental exposure to contamination.

The OEPA developed corrective rules that include a Site Feature Scoring System (SFSS) and risk-based action levels. The risk-based approach uses four tiers of risk assessment. The complexity of risk assessment increases from Tier I through Tier IV. The process initially uses conservative scenarios and assumptions. Less conservative assumptions are introduced later as additional site-specific data are provided to justify their use.

Tier I is the Site Feature Scoring System action level. Based on data collected during an initial site assessment, the responsible party completes a Site Feature Scoring System form, which determines whether additional corrective actions are necessary. If contamination is at or below the action level, further remediation is not required. If the action levels are exceeded, additional corrective actions are necessary (OEPA 2001).

As an alternative to Tier I (the Site Feature Scoring System action level), the OEPA allows owners and operators to conduct risk assessments to determine whether cleanup is necessary and to develop site-specific cleanup levels. Tier II, a baseline risk assessment, uses conservative assumptions about contamination pathways and chemicals.

Tier III is a more detailed risk assessment and, if sufficient data exist, specific contamination pathways (such as groundwater ingestion) may be eliminated in this tier.

Tier IV consists of a risk assessment with Monte Carlo sensitivity analysis. In contrast to risk assessment methods that express health risks as single numerical values with little information about uncertainty and variability surrounding the risk estimate, Monte Carlo simulation produces multiple risk descriptors that provide more complete information about the likelihood of various risk levels as well as multiple risk-based cleanup goals. Tier IV requires additional site-specific information to justify less conservative assumptions about contamination pathways and chemicals (USEPA 2001).

Of course, the OEPA will also accept cleanup to background levels.

Ohio's Voluntary Action Program Urban Setting Designation (USD):
Under Ohio's Voluntary Action Program, groundwater cleanup is required where contaminated groundwater poses a risk to the community or the environment. An Urban Setting Designation may be requested for a property participating in the Voluntary Action Program when there is no current or anticipated future use of the groundwater by local residents for drinking, showering, bathing, or cooking. An Urban Setting Designation can lower the cost of cleanup while still protecting public health and safety. A private state certified site professional must prepare and submit the request. The OEPA makes a decision on an Urban Setting Designation based on a demonstration by the applicant that a thorough evaluation of existing and future uses of groundwater in the area has been conducted. The OEPA also holds public meetings to obtain community input on requests for Urban Setting Designations for properties with groundwater contamination.

The OEPA issued an Urban Setting Designation to the Toledo-Lucas County Port Authority for areas located in the cities of Toledo and Oregon in 1998—comprising 5,014 acres in Toledo and 1,343 acres in Oregon. Once the cleanup requirements for the individual brownfields within the Urban Setting Designation area are determined, and these properties are remediated, the Port Authority can request a Covenant Not To Sue from the OEPA.

Cleanup process

Depending on the type and extent of contamination, the risk-based corrective action standards can allow a number of active technical cleanup procedures or environmental controls to protect human health, safety, and the environment, that have different cost and time requirements (Page 1997; Russ 2000). The various methods of remediation include:

- off-site remediation—extraction techniques that physically remove contaminated soil, groundwater, or surface water, and treats or confines it at another location;

- on-site remediation—avoids handling and transportation—for contaminated soil, volatile organic compounds (VOCs) can be: absorbed or fixed by phytoremediation (bioremediation) using genetically altered plant species; removed by thermal desorption treatment; or destroyed by incineration;
- avoidance—of expensive remediation—such as by locating impermeable surfaces like parking lots over areas of marginal contamination;
- institutional controls—documented limitations, such as deed restrictions on land or water use, that restrict access and eliminate or decrease exposure to hazardous substances; and
- engineering controls—design features, such as cap systems, that prevent or reduce human or environmental exposure to hazardous substances emanating from a site.

Stickney West Site

This 68 acre site runs along Tyler Street and Creekside Avenue. Hemisphere Corp. responded to a City of Toledo Request for Proposals, purchased the site, and signed a development agreement for a 100-150 acre industrial park to support the new Daimler-Chrysler Jeep Assembly Plant, less than a mile to the east. The site—containing the former Royster fertilizer manufacturing facility, a.k.a. Gorney Site, 2 acre wastewater retention impoundment, and unlicensed salvage yard operated by Toledo Recycling—had 200,000 tires, 50,000 railroad ties, asbestos-containing materials, 212 abandoned drums with unspecified materials, automobile engines and fuel tanks, wooden pallets, partially degraded wetlands, contaminated soil and groundwater, and fertilizer waste piles. The City secured grants for cleanup—asbestos removal, decommissioning tanks, site earthwork, tire management, and disposal of materials that the City purchased from Hemisphere for capping the adjacent Dura Avenue landfill. An unnamed tributary of the Ottawa River, with some of highest PCB-contaminated sediments on the Great Lakes, was remediated as a wetland area. As part of the area-wide Urban Setting Designation, cleanup requirements were lowered because the future use of the groundwater by residents does not include drinking, showering, bathing, or cooking. The site is a USEPA No Further Remedial Action Planned site. It is bordered by three closed landfills: 1) 41 acre Tyler landfill whose modified cap allows redevelopment after monitoring—Hemisphere Corp. has development rights; 2) 50 acre Stickney landfill; and 3) 55 acre Dura Avenue landfill.

Source: City of Toledo (1996) *Lucas County Contaminated Sites Directory*.

The cleanup costs for a site like Stickney West can be expensive. There can also be significant transaction costs, such as legal and regulatory fees. Even after remediation, there are substantial costs involved in redeveloping the site for its new use. The next section of this report addresses financing remediation and redevelopment.

9. Financing Remediation and Redevelopment

Traditionally, uncertainty about the costs of environmental assessment and remediation delayed brownfield redevelopment. Private lender concerns about credit and investment risks resulted in a lack of capital to fund redevelopment before and after remediation. Private lending institutions were unwilling to provide loans for sites that might be contaminated. Aside from the lender's liability, there were concerns about the impaired collateral value of a site if was contaminated, and the owner's ability to repay the loan if major cleanup costs arose (Bartsch & Collaton 1997; Page 1997). Owners of brownfields have also been leery of using public financial incentives because of concerns about the process and timing of obtaining government assistance.

During the last decade, however, there has been a steady increase in the availability and use of public (federal, state, and local) incentives and private finance for assessment, remediation, and redevelopment. The following is a list of important potential funding sources for brownfield redevelopment with web site addresses for further information.

Federal incentives

Brownfields Assessment Demonstration Pilots (USEPA)
http://www.epa.gov/swerosps/bf/pilot.htm#pilot (accurately catalogued June 2001)
Since 1995, the USEPA has awarded Brownfields Assessment Demonstration Pilot Grants—of $200,000 over two years—to states, cities, towns, counties, and tribes—to test redevelopment models, direct efforts towards removing regulatory barriers without sacrificing protection, and facilitate coordinated redevelopment among all government levels and the private sector.

The City of Toledo's Brownfields Assessment Demonstration Pilot:
The Toledo Brownfields Group was set up in the early 1990s as the Mayor's Environmental Advisory Board. It comprises individuals from government, community development corporations (CDCs), environmental consulting firms, financial institutions, developers, property owners, and universities. It promotes brownfield redevelopment by exploring creative mechanisms to encourage reuse and eliminate obstacles to redevelopment.
The Toledo Brownfields Group assumed an active role in the 1998 Pilot Grant, to:

- collect and disseminate information on brownfields via an inventory of sites;
- identify and promote the redevelopment of the most marketable sites;
- investigate available local, state, and federal tools that promote redevelopment (including technical assistance, guidance for cleanup; and available funding);
- seek funding for brownfield cleanup and redevelopment; and
- solicit input and support from targeted communities.

The two-year period of the Pilot Grant has expired, but the Toledo Brownfields Group has received a six month extension to finish the site inventory. It continues to be active in promoting brownfield remediation and redevelopment.

Supplemental Assistance for Brownfields Assessment Demonstration Pilots (USEPA)
http://www.epa.gov/brownfields/html-doc/supfinal.htm (accurately catalogued June 2001)
Brownfields Assessment Demonstration Pilot communities can apply for supplemental funding of up to $150,000 to continue and expand their brownfield assessment efforts. An additional $50,000 may be awarded to carry out assessments at brownfields that will be used for greenspace purposes like parks.

The City of Toledo has a pending application.

Brownfields Showcase Communities (USEPA)
http://www.epa.gov/swerosps/bf/showcase.htm (accurately catalogued June 2001)
The Brownfields National Partnership brings together more than 15 federal agencies to demonstrate the benefits of coordinated and collaborative approaches to brownfield remediation and redevelopment at over two dozen Brownfields Showcase Communities. A wide range of support is leveraged depending on the particular needs of each of these communities.

Ohio does not have a designated Brownfields Showcase Community. The Brownfields Showcase Communities that are located nearest to the Toledo metropolitan region are Chicago, IL, Milwaukee, WI, and the Niagara Region, NY.

Brownfield Job Development and Training Pilots (USEPA)
http://www.epa.gov/swerosps/bf/pilot.htm#job (accurately catalogued June 2001)
Beginning in 1998, the USEPA provided $200,000 over two years to states, political subdivisions, tribes, and nonprofit educational or training centers at or near Brownfields Assessment Demonstration Pilot communities. The goal is to facilitate cleanup of hazardous waste sites and training for residents in communities impacted by brownfields in order to prepare them for future employment in the environmental field.

City of Toledo Brownfield Job Development and Training Pilot:
$200,000 was awarded in 2000 to train about 100 residents who are minorities or single mothers for careers in testing and cleaning hazardous waste sites. Students receive six to eight weeks of training through Owens Community College and then seek jobs averaging $18,000 to $20,000 annual salaries at Toledo engineering and environmental cleanup firms.

Targeted Brownfields Assessments (TBA) Program (USEPA)
http://www.epa.gov/swerosps/bf/html-doc/tba.htm (accurately catalogued June 2001)
The Targeted Brownfields Assessment program, targeted at public entities—especially those without USEPA Brownfields Assessment Demonstration Pilots— provides funding and technical assistance for Phase 1 and 2 environmental assessments at hazardous waste sites, and for establishing cleanup options and cost estimates based on future uses and redevelopment plans.

Resource Conservation and Recovery Act/Brownfields Prevention Pilots (USEPA)
http://www.epa.gov/swerosps/bf/html-doc/bfrcra4p.htm (accurately catalogued June 2001)
Resource Conservation and Recovery Act/Brownfields Prevention Pilot projects have been awarded to a small number of communities (not including Toledo) where cleanup approaches are tested that better integrate reuse considerations into the corrective action cleanup process, and that address concerns that the application of Resource Conservation and Recovery Act to cleanup is slowing down the process. The USEPA wants to test a variety of innovative approaches that expedite cleanups, and use the information gathered to improve the administration of the Resource Conservation and Recovery Act program.

Clean Water State Revolving Loan Fund (USEPA)
http://www.epa.gov/brownfields/html-doc/cwsrf.htm (accurately catalogued June 2001)
The Clean Water Act authorizes the USEPA to provide grants to states in order to capitalize revolving loan funds for low-interest loan programs. The water quality improvement funds can be used by public entities to address all forms of water contamination from brownfields, including the excavation and disposal of underground storage tanks, excavation, removal, and disposal of contaminated soil, and Phase 1 and 2 assessments.

Superfund Technical Assistance Grants (TAGs) (USEPA)
http://www.epa.gov/seahome/resources/funding-details.htm#TAGs (accurately catalogued June 2001)
Superfund Technical Assistance Grants of up to $50,000 are available to communities affected by a National Priorities List site for use in obtaining technical assistance in interpreting information regarding the site.

Leaking Underground Storage Tank Trust Fund (USEPA)

http://www.epa.gov/swerust1/ltffacts.htm (accurately catalogued June 2001)

Created by Congress in 1986 by amending Subtitle I of the Resource Conservation and Recovery Act, the Leaking Underground Tank Trust Fund is financed by a 0.1 cent tax on each gallon of motor fuel sold in the country. Over $2.4 billion has been collected to provide funds for USEPA and state EPA programs for:

1) overseeing corrective action taken by a responsible party who is the owner or operator of a leaking underground storage tank; and
2) cleanups at underground storage tank sites where the owner or operator is unknown, unwilling, or unable to respond, or which require emergency action.

Brownfield Tax Incentive (U.S. Department of Treasury)

http://www.epa.gov/swerosps/bf/html-doc/taxfs_2.htm (accurately catalogued June 2001)

The 1997 Taxpayer Relief Act included a $1.5 billion tax incentive that allows businesses in economically distressed urban and rural areas to "expense" brownfield cleanup costs. This is intended to leverage billions of dollars in private investment at thousands of contaminated, abandoned sites by reducing the private cost of remediation. It permits cleanup costs to be immediately deducted for tax purposes during the year the costs are incurred, rather than requiring the expense to be capitalized and deducted over some period of years on an amortized basis.

Eligible properties, which exclude National Priorities List sites, must have a release, threat of a release, or disposal of a hazardous substance.

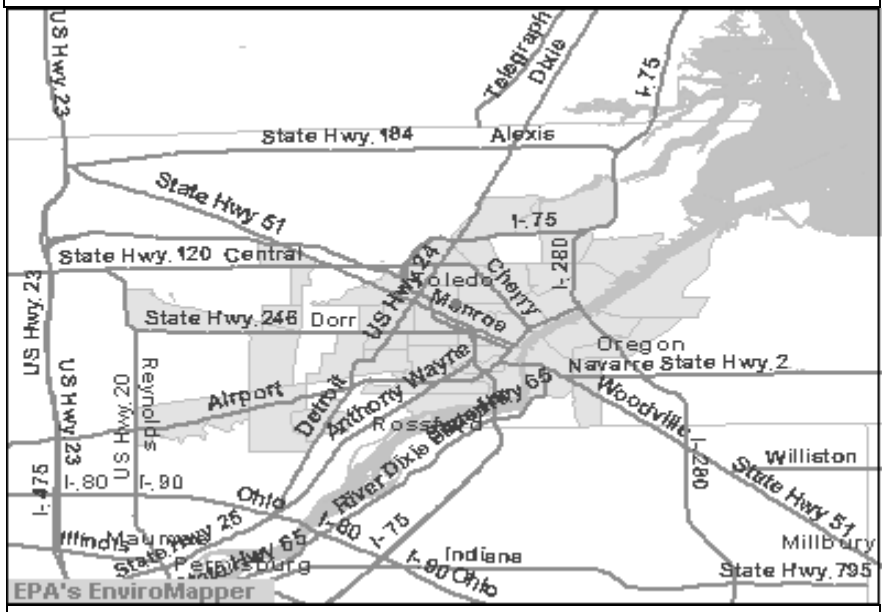
Originally scheduled to expire after three years, it covered eligible costs from the date of enactment until January 1, 2001, and now has been extended to December 31, 2002, with its provisions expanded by the 2000 Community Tax Relief Act.

Eligibility has now been widened to include all properties where the owner can obtain certification from the appropriate state agency that the site has had a release, the threat of a release, or disposal of any hazardous substance.

Previously, the deduction was available for abatement or control of hazardous substances only at sites within targeted/qualified areas:

- the 76 USEPA Brownfields Pilots underway by early 1997 (Toledo's Pilot began 1998);
- Census tracts where 20 percent or more of the population was below the poverty level;
- Census tracts with a population under 2,000, 75 percent or more of the land zoned for industrial or commercial use, and adjacent to one or more census tracts with a poverty rate of 20 percent or more; and
- HUD Empowerment Zones (EZs) or Enterprise Communities (ECs) (Toledo does not have an Empowerment Zone or an Enterprise Community).

Toledo's 1997-2000 Brownfields Tax Incentive Zone



Source: *http://maps.epa.gov/* (accurately catalogued June 2001)

Community Development Block Grant (CDBG) program (HUD)

http://www.hud.gov:80/progdesc/cdbgent.cfm (accurately catalogued June 2001)

The Community Development Block Grant program provides annual formula grant funds to metropolitan cities and urban counties (either directly or through the states) to carry out community and economic development activities that:

- benefit low and moderate income persons;
- prevent or eliminate slums or blight; or
- address conditions that present serious and immediate threats to the health and safety of a community.

Brownfield redevelopment activities are eligible uses for Community Development Block Grant funds. These funds can be used for:

- economic development—loans to developers for buildings;
- acquisition—of real property; and
- site improvement/public facilities—roads/water/sewers; demolition, clearance, and cleanup.

Section 108 Loan Guarantee Program (HUD)

http://www.hud.gov:80/progdesc/cdbg-108.cfm (accurately catalogued June 2001)

Section 108, the loan guarantee provision of the Community Development Block Grant program, provides low interest loan guarantee authority. It allows local governments to transform a portion of their Community Development Block Grant funds into federally-guaranteed Section 108 loans large enough to pursue projects to renew entire neighborhoods—for economic development, housing rehabilitation, public facilities, and other eligible large scale physical redevelopment projects including brownfield redevelopment activities. The guaranteed amount must not exceed five times the amount of the most recent Community Development Block Grant allocation. The maximum loan term is 20 years. Local governments (and states, if applicable) must pledge their future years'

Community Development Block Grant allocations (up to the loan amount) as security for the Section 108 loans guaranteed by HUD. The Section 108 program, however, does not require Community Development Block Grant funds to be escrowed for loan repayment. This means that a local government can continue to spend its existing allocation for other Community Development Block Grant purposes, unless it is needed for loan repayments.

Brownfields Economic Development Initiative (BEDI) (HUD)
http://www.hud.gov/bedifact.cfm (accurately catalogued June 2001)
Enacted in 1998, the Brownfields Economic Development Initiative has an annual budget of $25 million for competitive awards for economic development grant assistance to public entities for use in redeveloping brownfields. These funds are often paired with a Section 108 guaranteed loan. The Brownfields Economic Development Initiative grants can be used to pay the predevelopment costs of a Section 108-funded project, as a loan loss reserve (in lieu of Community Development Block Grant funds), to write-down interest rates, or to establish a debt service reserve. Eligible applicants are units of general local government. Non-entitlement communities are eligible to apply for a Brownfields Economic Development Initiative award but need their state to pledge some HUD Community Development Block Grant funds as collateral for the Section 108 loan guarantee.
A public entity:

- may borrow up to five times its most recent annual HUD Community Development Block Grant allocation;
- pledges Community Development Block Grant funds as partial security for the loan guarantee for debt service if needed; and
- obtains the rest of the collateral usually out of security from the project that is assisted with the Section 108 funds (e.g. real property; liens on machinery and equipment; accounts receivable inventory; pledges of tax revenues from local governments; full faith and credit pledges from local governments; loan portfolios and continuing cash flow from portfolios (of local governments)).

The minimum leveraging ratio is one private dollar for each public dollar spent. Usually, however, each public dollar is expected to leverage more than one private dollar. The Brownfields Economic Development Initiative funds are used to motivate local governments and private-sector parties to begin or continue redevelopment efforts on brownfields where contamination is known or suspected and redevelopment plans exist. HUD does not encourage applications when the scope is limited only to land banking. HUD wants the Brownfields Economic Development Initiative and Section 108 funds to finance projects that provide short-term results and demonstrable economic benefits—such as job creation and increased local tax base. Finance is available for projects that include:

- Land Write-downs—Local governments may use Section 108 and Brownfields Economic Development Initiative funds to acquire a brownfield and re-convey it to a private developer at a discount to create an asset of enhanced value that can be used as collateral for other sources of funding to finance environmental remediation or other development costs. The idea is that the level of the Brownfields Economic Development Initiative assistance approximates the difference between the original cost of the site plus remediation, compared to the market value of the remediated property.
- Site Remediation Costs—Local governments may use the Brownfields Economic Development Initiative funds for site remediation costs. If the local government used

Section 108 funds to acquire real property, the Brownfields Economic Development Initiative funds could be used to address assessment and site remediation costs as part of demolition, clearance, or site preparation activities. If the local government used Section 108 funds to make a loan to a developer, the Brownfields Economic Development Initiative funds could be granted to the developer for remediation costs as part of an economic development activity.

Lead-Based Paint Hazard Control program (HUD)
http://www.hud.gov:80/offices/lead/index.cfm (accurately catalogued June 2001)
This program provides competitive grants to state and local governments to evaluate and reduce lead-based paint hazards in private housing that is rented or owned by low-income families.

Economic Development Initiative (EDI) Grant Program (HUD)
http://www.hud.gov/progdesc/edi.cfm (accurately catalogued June 2001)
Enacted in 1994, with an annual budget of $25 million, the Economic Development Initiative is intended to complement and enhance the Section 108 loan guarantee program to fund economic development projects, which can include brownfield redevelopment. Like the Brownfields Economic Development Initiative, the purpose of an Economic Development Initiative grant is to further minimize the potential loss of future Community Development Block Grant allocations by:

- strengthening the economic feasibility of projects financed with Section 108 funds;
- directly enhancing the security of the guaranteed loan; or
- by using a combination of these or other risk mitigation techniques.

Empowerment Zone (EZ)/Enterprise Community (EC) Social Service Block Grant (SSBG) Initiative (HUD)
http://www5.hud.gov/urban/welcome/welcome.asp (accurately catalogued June 2001)
Adopted in 1994, targeted communities apply to and are designated as an Empowerment Zone or Enterprise Community by HUD. Many Empowerment Zones and Enterprise Communities identified brownfield redevelopment as a critical element in their local economic revitalization strategy. Empowerment Zones and Enterprise Communities offer significant economic incentives to private companies and individuals for use in brownfield cleanup and redevelopment. These incentives include:

- HUD Economic Development Initiative funds;
- HUD Section 108 loan guarantees;
- Health and Human Services Social Service Block Grants;
- the Brownfields Tax Incentive;
- Tax-exempt bond financing;
- Section 179 Expensing;
- the Work Opportunity Tax Credit; and
- the Welfare-to-Work Tax Credit.

Toledo does not have an Empowerment Zone or Enterprise Community.

Public Works and Development Facilities Grant Program (Economic Development Administration (EDA), U.S. Department of Commerce)
http://www.doc.gov/eda/html/pwprog.htm (accurately catalogued June 2001)
These Economic Development Administration grants range from $500,000 to $1 million. The funds are available to public and private organizations in economically distressed counties. The project must help specific businesses and relate to economic development—job growth or retention—for water, wastewater, road, and port projects, and can include brownfield cleanup projects.

Planning Program Grants (EDA)
http://www.doc.gov/eda/html/2c2_econdevplng.htm (accurately catalogued June 2001)
The Economic Development Administration has two planning programs, with grants ranging from $10,000 to $200,000, for:
1) Economic Development Districts, Indian Tribes, and Redevelopment Areas; and
2) States and Urban Areas.
The goal is to create new jobs, retain existing jobs, and stimulate industrial and commercial growth in economically distressed areas. The funds can be used towards the planning costs of brownfield projects.

Local Technical Assistance Program (EDA)
http://www.doc.gov/eda/html/locltech.htm (accurately catalogued June 2001)
The Economic Development Administration provides grants averaging $30,000 to distressed areas to assist in addressing special development issues. Grants can support feasibility studies of potential economic development projects that communities are considering, such as industrial parks or business incubators on brownfields.

Economic Adjustment Program (EDA)
http://www.doc.gov/eda/html/econadj.htm (accurately catalogued June 2001)
This Economic Development Administration program provides grants averaging $175,000 to states and local governments in areas experiencing serious economic dislocation or decline. The funds are used to plan or implement redevelopment programs to attract private-sector investment and participation in projects that strengthen the area's economic base. These projects can include brownfield redevelopment.

Technical Assistance (Army Corps of Engineers, U.S. Department of Defense)
http://hq.environmental.usace.army.mil/programs/brownfields/brownfields.html (accurately catalogued June 2001)
The Corps provides expertise and engineering services to communities for evaluating brownfield problems and helping with cleanups, especially along waterways.

<u>Public Health Department Grants</u> (U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR))
http://www.ATSDR.cdc.gov/COM/commhome.htm (accurately catalogued June 2001)
These grants range from $50,000 to $70,000 for local public health departments with jurisdiction within the USEPA Brownfields Showcase Communities for cleanup and to help revitalize brownfields.

Superfund Worker Training Grants Program (Department of Health and Human Services, National Institute of Environmental Health Services (NIEHS))
http://www.NIEHS.nih.gov/ (accurately catalogued June 2001)
Originally authorized as part of the federal Superfund program, these training grants provide model occupational safety and health training for workers performing dangerous jobs in hazardous waste management and cleanup programs.

Livable Communities Initiative (Department of Transportation Federal Transit Administration (DOT FTA))
http://www.bts.gov/ntl/DOCS/livbro.html (accurately catalogued June 2001)
As part of the Livable Communities Initiative, the Federal Transit Administration provides planning and technical assistance for local site reclamation, transit planning, and smart growth efforts that support brownfield redevelopment.

Transportation and Community and System Preservation Pilot Program (TCSP) (DOT Federal Highway Administration (FHWA))
http://www.fhwa.dot.gov/environment/bnfldmem.htm (accurately catalogued June 2001)
The Transportation and Community and System Preservation Pilot Program provides funding for improving road access to redeveloped brownfields. The Federal Highway Administration provides technical assistance, training, and guidance to states, local governments, and metropolitan planning organizations (MPOs) to help access funding and ensure that brownfields are included in transportation planning.

Community Affairs Program (Federal Deposit Insurance Corporation (FDIC))
http://www.fdic.gov/consumers/community/ (accurately catalogued June 2001)
In 1990, the Federal Deposit Insurance Corporation established a Community Affairs Program to promote compliance with the Community Reinvestment Act (CRA) and fair lending laws by institutions supervised by the Federal Deposit Insurance Corporation. Enacted by Congress in 1977 in an effort to augment federal efforts to stabilize declining urban areas, the Community Reinvestment Act requires banks, thrifts, and other lenders to make loans available in low- and moderate-income urban neighborhoods. The Federal Deposit Insurance Corporation tries to ensure equal access to credit, works with lenders and the public to revitalize communities, and serves as an intermediary to advance fair lending objectives.

State of Ohio incentives

Issue 1
http://www.state.oh.us/ohio/legislat.htm (accurately catalogued June 2001)
The state's constitutional amendment— Issue 1 approved by Ohio voters in 2000—allows the state to borrow $400 million, with $200 million targeted to cleanup brownfields and $200 million to preserve greenfields (including farmland and woodlands). The Ohio legislature voted in favor of the bill in early 2001, and it now awaits the Governor's signature.

State pass-through funding

Voluntary Action Program Grant

http://www.epa.state.oh.us/derr/volunt.html (accurately catalogued June 2001)

The Voluntary Action Program received an October 1, 1998 to June 30, 2000 grant from the USEPA that provided $250,000 for programmatic activities and $150,000 for site-specific efforts for Voluntary Action Program activities each year. The programmatic activities were primarily guidance development, marketing, outreach, and training. The site-specific activities were Voluntary Action Program auditing activities and free or subsidized technical assistance to volunteers who would otherwise be unable to afford the cost of the Voluntary Action Program technical review of their investigation and cleanup activities.

Brownfields Site Assessment Grants (OEPA, Division of Emergency and Remedial Response (DERR))

http://www.epa.state.oh.us/derr/derrsmp.html (accurately catalogued June 2001)

The Division of Emergency and Remedial Response has received grant money since 1997 from the combined USEPA Core Funding Cooperative Agreement and the Superfund Cooperative Agreement for site assessments at qualified brownfields. This grant, of approximately $400,000 each year, is administered through the Division of Emergency and Remedial Response's Preremedial Program, which targets approximately ten brownfields every year. The sites are publicly owned and/or operated—usually tax delinquent properties where ownership has been conveyed to a local government—and are selected based on factors such as financial need and redevelopment potential. The grant money is not conveyed to the selected property owners/operators but is spent by the Division of Emergency and Remedial Response for Phase 1 and 2 site assessment work for the Voluntary Action Program.

Grants

Economic Development Program (Office of Housing and Community Partnerships (OHCP) and Ohio Department of Development (ODOD))

http://www.resourceohio.com/fr_tax.html (accurately catalogued June 2001)

This program receives funds from the HUD Community Development Block Grant to offer as grants to non-entitlement counties and cities to assist in the expansion and retention of business and industry that creates and retains permanent private-sector jobs, especially for low and moderate income persons. Brownfield projects are eligible. Grants of up to $400,000 are available to small cities or non-urban counties for off-site infrastructure activities.

Brownfield Urban and Rural Initiative Grant Program (House Bill 442) (ODOD, Office of Business Development)

http://www.odod.state.oh.us/ (accurately catalogued June 2001)

This was a reimbursement grant program of up to $500,000 to assist nonprofit economic development organizations in state-specified "distressed communities" containing brownfields that already had a Covenant Not To Sue. The funds could be used for land acquisition, infrastructure improvements, and renovating existing buildings. The $20 million for this program were depleted by April 1998. Additional funding may be available in the near future.

Loans

Brownfields Site Clean-Up Loans (Senate Bill 221 (Voluntary Action Program (VAP)))
(OEPA, Division of Environmental Financial Assistance (OEFA))
http://www.resourceohio.com/fr_tax.html (accurately catalogued June 2001)
These loans provide financial assistance to private and public entities for brownfield cleanup. The OEPA has dedicated funds to create two loan programs that have an initial capitalization of $30 million.

Water Pollution Control Loan Fund (WPCLF) (OEFA))
http://www.epa.state.oh.us/defa/ (accurately catalogued June 2001)
This fund provides low-interest long term loans to individuals, businesses, and political subdivisions to be repaid over a period of up to 20 years for any Voluntary Action Program activity that results in water quality benefits to surface and/or groundwater, including Phase 1 and 2 assessments and actual cleanup. The Water Pollution Control Loan Fund provides up to $3 million to a project.

Pollution Prevention Loan Program (OEPA, Office of Pollution Prevention (OPP))
http://www.resourceohio.com/fr_tax.html (accurately catalogued June 2001)
This program offers low-interest capital improvement loans to businesses and facilities with less than 500 on-site employees to incorporate pollution prevention techniques into standard commercial and manufacturing operations while retaining jobs. Loans range from $25,000 to $350,000 per facility and up to 75 percent of the project costs for the purchase of equipment and/or construction to complete pollution prevention activities.

Loan Program (Ohio Water Development Authority (OWDA))
http://www.epa.state.oh.us/derr/vap/financial/finance.html (accurately catalogued June 2001)
These loans are available to local governments or private businesses to cleanup publicly or privately owned properties. Direct lending at favored rates means that the Ohio Water Development Authority can enhance a private borrower's ability to obtain conventional financing by lending a portion of the project's cost directly to the borrower. By charging a market interest rate, based on a standard financial parameter, the Ohio Water Development Authority can help the borrower to present a pro forma more likely to show financial feasibility. Planning loans of up to $500,000 are also available to private entities for Phase 1 and Phase 2 assessment planning.

Economic Development Program (OHCP and ODOD)
http://www.resourceohio.com/fr_tax.html (accurately catalogued June 2001)
This program receives funds from the HUD Community Development Block Grant to offer loans to businesses for projects where full-time permanent jobs for low- and moderate-income workers will be created and/or retained. Brownfield remediation and redevelopment projects are eligible. Up to $500,000 is available in direct loans to businesses.

Revolving Loan Fund (OHCP and ODOD)
http://www.resourceohio.com/fr_tax.html (accurately catalogued June 2001)
This fund uses HUD Community Development Block Grant funds to provide financing to property users or developers for fixed assets in projects that create or retain jobs for low- and

moderate-income workers, and to help in the development, rehabilitation, or revitalization of participating "small city" communities. Brownfield projects are eligible.

Urban Redevelopment Loan Program (ODOD)
http://www.epa.state.oh.us/derr/vap/financial/urdlp.html (accurately catalogued June 2001)
This program provides direct loans to municipalities or designated nonprofit economic development organizations to acquire real estate for assembly into developable parcels and to cleanup site contamination in state-designated distressed urban communities. The loan fund allocation is $30 million and the maximum loan is $5 million.

Direct Loan (166 Loan) (ODOD, Office of Financial Incentives)
http://www.resourceohio.com/tax3.1.html (accurately catalogued June 2001)
These low-interest loans of up to 30 percent of total eligible fixed costs (of $350,000 to $1 million) are available to companies for land and building acquisition, expansion, or renovation, and equipment purchase, for projects in which jobs are created or retained. With industrial projects preferred, brownfields are eligible.

Loan guarantees (credit enhancement) (OWDA)
http://www.epa.state.oh.us/derr/vap/financial/finance.html (accurately catalogued June 2001)
These loan guarantees are available to assist public or private parties to obtain project financing for Voluntary Action Program assessment and cleanup. These guarantees reassure capital providers about the safety of lending for brownfield redevelopment by providing an additional source of repayment in the event of project bankruptcy.

Tax credits
Brownfield Site Cleanup Tax Credit Program (House Bill 441 (Voluntary Action Program (VAP))) (ODOD)
http://www.odod.state.oh.us/factbook/edd_factsheet_4.htm (accurately catalogued June 2001)
This program gives individual and corporate taxpayers, who have been issued a Covenant Not To Sue as part of the Voluntary Action Program, a state franchise or income tax credit for remediating a contaminated site. It is based on a percentage of the eligible costs of cleanup including the cost of Phase 1 and 2 assessments. The credit is generally 10 percent of the eligible remediation costs up to $500,000 between July 1, 1996 and June 30, 1999 taken over a five-year period (20 percent per year).

Tax abatements
Tax Abatements (Ohio Department of Taxation)
http://www.epa.state.oh.us/derr/vap/financial/finance.html (accurately catalogued June 2001)
This state program grants property owners, who have been issued a Covenant Not To Sue as part of the Voluntary Action Program, a 10-year (a) exemption from any increase in property taxes because of an increase in the assessed valuation of the land that was remediated (ORC 5709.87) and (b) exemption from property taxes on improvements, buildings, and fixtures (ORC 5709.88). If a redevelopment involves new investment in real and personal tangible projects, the state authorizes local governments to allow a similar abatement of real and personal property taxes.

City of Toledo, Lucas County, and Toledo-Lucas County Port Authority Incentives

The City, County, and Port Authority take advantage of funding for brownfield redevelopment from the state and federal governments, and also provide their own incentives (for more information, consult the web sites listed in the Key References on page 48).

Tax abatements
A local government can enter into an agreement to grant a tax abatement for properties that have been issued a Covenant Not To Sue as part of the Voluntary Action Program. The developer must (a) provide the legislative authority of the city with information, such as the number of employees retained and newly hired, and an estimate of the amount of money to be invested for additions or improvements, and (b) agree to spend at least 250 percent of the tax value of the real property both on the project and on hiring new employees or retaining existing jobs. The local government can provide one or more of the following incentives:

- an exemption for up to 10 years of a portion of the assessed value of tangible personal property first used at the property as a result of the incentive agreement;
- an exemption for up to 10 years of a portion of the increase in the assessed valuation of buildings, improvements, structures, and fixtures at the site; and
- provision of up to 10 years for any optimal services or assistance that the local government is authorized to provide.

Non-Conduit Debt Financing
Certain "non-conduit" components of a brownfield project—such as permanent public improvements like infrastructure—can be paid for by issuing bonds backed by public moneys—General Obligation Bonds (subject to debt limits and other legal requirements) or Special Revenue Bonds (payable from revenues derived from governmental operations (e.g. water or wastewater systems)).

Conduit Debt Financing
The components of a brownfield project that are not eligible to be financed with public debt obligations payable from or secured by taxes or other public revenues may qualify for "conduit" financing—where the local government issues debt obligations payable from and secured by loan or lease payments from the private business owners or developers of the project. Though not backed by public moneys, these bonds can provide federal or state tax advantages to the bondholders or the developer.

Tax Increment Financing (TIF)
A local government can establish a tax increment district for specified periods such as 10 or 20 years, sell Tax Increment Finance bonds, and use the funds to finance the improvements needed to redevelop a brownfield. These improvements generate revenue, from the positive incremental change in property value, which is used to pay off the bonds. In the tax increment district, certain property taxes are abated, but the owner is obliged to make payments in lieu of the abated taxes that instead are dedicated to paying the principal and interest for the Tax Increment Finance bonds.

Land subsidies
Under certain circumstances, local governments can acquire and provide land to a developer of a project on advantageous terms and with favorable financing.

Loan guarantees (credit enhancement)
Like the states, local governments can help a developer to obtain conventional financing by enhancing the security for the developer's funding by pledging certain publicly funded reserves for loan repayments in the event of a brownfield project bankruptcy.

Private Lending Institutions

Private lenders typically include commercial banks and institutional investors accessed through investment bankers. Most private sources have limits on the amount advanced against the completed value of a project inclusive of cleanup costs—usually 50 to 80 percent of the market value. Private lending institutions can exceed these limits when governments provide guarantees for larger percentage advances (Bartsch & Collaton 1997; Page 1997).

Real Estate Investment Trusts (REITs)
http://www.nareit.com/ (accurately catalogued June 2001)
REITs (pronounced "reets") are funds comprising the revenues from private investors. The Real Estate Investment Trust acts as the primary investor and owner when purchasing a brownfield property, thereby shielding the investors from liability in excess of the investor's initial monetary input.

Federal Housing Finance Board (FHFB) and Federal Home Loan Bank (FHLBank) System
http://www.fhfb.gov (accurately catalogued June 2001)
The Federal Housing Finance Board, through the Federal Home Loan Bank system that it regulates, provides financing for community and economic development projects. The 12 regional Federal Home Loan Banks are privately capitalized, cooperative, government-sponsored enterprises created by Congress in 1932. The Federal Home Loan Banks provide their more than 6,500 members (such as commercial banks, savings institutions, credit unions, and insurance companies) with access to economical wholesale credit products. Federal Housing Finance Board Community Investment Program (CIP) funds are targeted to benefit low- and moderate-income families and can be used to finance home purchases and for commercial, infrastructure, or business projects. Community Investment Program funds have been used to finance brownfield redevelopment projects.

Since the mid-1990s, there has been a significant increase in the availability of public and private finance for brownfield redevelopment. The only potential drawback for private companies and individuals is that the sheer number of funding agencies and initiatives can increase the complexity and time involved in securing redevelopment funds. Moreover, in the allocation of public funds, care must be taken to connect brownfield redevelopment that is financed by government spending to broader community goals. These goals are outlined in the next and final section of this report.

10. Connecting Brownfield Redevelopment to Broader Community Goals

Governments at all levels now have policies that actively encourage the cleanup and reuse of brownfields. But further progress is necessary to address the remaining impediments to brownfield redevelopment involving legal liability, regulatory and institutional issues, cleanup standards, and financing remediation and redevelopment. The U.S. Conference of Mayors 2000 survey of 231 cities identified three major issues that continue to present obstacles to brownfield reuse: 1) lack of funding for environmental cleanup, 2) liability problems from federal Superfund legislation, and 3) requirements for expensive environmental assessments.

Overcoming these continued obstacles so that individual brownfields can be redeveloped is certainly the immediate objective of public, private, and neighborhood efforts. But the ultimate aim must be to connect brownfield reuse to broader community goals—job creation and worker training, of course, but also pollution prevention, environmental and public health improvement, central city revitalization, open-space preservation, housing and transportation provision, and upgrading public infrastructure and amenities (Bartsch & Collaton 1997; Greene 1996).

The need for collaborative efforts among governments at all levels working with private and nonprofit/community bodies and individuals to achieve successful brownfield reuse can be daunting. Yet increasing recognition of a common interest in brownfield redevelopment may stimulate the production of the kinds of efforts and resources needed to make the opportunities outweigh the challenges at numerous properties. Many of these brownfields offer opportunities for urban revitalization that can help achieve important social and environmental goals, at the same time as producing potentially significant returns on private investments. And the stakes are high—in the long run, brownfield redevelopment can contribute to creating environmentally, socially, and economically sustainable communities and urban areas for current and future generations.

11. Key Information Sources on Brownfield Redevelopment

Selected Books, Reports, Articles

Bartsch, Charles and Elizabeth Collaton. 1997. *Brownfields Redevelopment: A Guidebook for Local Governments and Communities*. Washington, DC: Northeast-Midwest Institute for International City/County Management Association.

Black, J. Thomas. 1994. Recycling Inactive Urban Industrial Sites, in *Urban Growth: Development, Prospects, and Issues*. Washington, DC: Urban Land Institute, 36-48.

Borak, David and Charles Meek. 1999. *Putting the Pieces Together: Local Government Coordination of Brownfield Redevelopment*. Washington, DC: International City/County Management (ICCM) Association for the Superfund/Brownfield Research Institute.

City of Toledo. 1996. *Lucas County Contaminated Sites Directory*. Toledo: City of Toledo, Division of Environmental Services.

Collaton, Elizabeth and Charles Bartsch. 1996. Industrial Site Reuse and Urban Redevelopment—An Overview, *Cityscape*, 2:3, 17-61.

Gibbons, Juel S., Nii O. Attoh-Okine, and Shonali Laha. 1998. Brownfields Redevelopment Issues Revisited, *International Journal of Environment & Pollution*, 10:1, 151-162.

Greenberg, Michael and Dona Schneider. 1995. Hazardous waste site cleanup and neighborhood redevelopment: An opportunity to address multiple socially desirable goals, *Policy Studies Journal*, 23:1, 105-112.

Greene, Kevin. 1996. *Recycling Contaminated Land: A Community Resource Guide*. Chicago, IL: Center for Neighborhood Technology.

Hanley, Cassandra M. 1995. Developing Brownfields: An Overview, *The Journal of Urban Technology*, 2:2, 1-8.

Lerner, Steve. 1996. Brownfields of Dreams, *Amicus Journal*, Winter, 17, 15-21.

Meyer, Peter B. and H. Wade van Landringham. 2000. *Reclamation and Economic Regeneration of Brownfields*. Washington, DC: Economic Development Administration, U.S. Department of Commerce (available at *http://www.doc.gov/eda/pdf/meyer.pdf*).

Page, William G. 1997. *Contaminated Sites and Environmental Cleanup: International Approaches to Prevention, Remediation, and Reuse*. San Diego: Academic Press.

Page, William G. and Harvey Z. Rabinowitz. 1994. Potential for Redevelopment of Contaminated Brownfield Sites, *Economic Development Quarterly*, 8:4, 353-363.

Pepper, Edith M. 1997. *Lessons from the Field: Unlocking Economic Potential with an Environmental Key*. Washington, DC: Northeast-Midwest Institute.

Ruben, Barbara. 1995. Fields of Dreams? *Environmental Action*, 26:4, 13-17.

Russ, Thomas H. 2000. *Planning and Redeveloping Brownfields*. New York: McGraw-Hill.

Simons, Robert A. 1998. *Turning Brownfields Into Greenbacks: Developing and Financing Environmentally Contaminated Urban Real Estate*. Washington, DC: Urban Land Institute.

Selected Information Sources on the Internet (accurately catalogued on June 10, 2001)

National

Association of State and Territorial Solid Waste Management Officials (ASTSWMO) seeks to enhance and promote effective state and territorial waste management programs, and affect national waste management policies. This focus includes Superfund and state cleanup programs, waste management and cleanup activities at federal facilities, and underground storage tank and leaking underground storage tank programs.
http://www.astswmo.org/

Brownfields Center run from the Carnegie Mellon University and The University of Pittsburgh tries to improve the brownfield redevelopment process by promoting interdisciplinary scholars to develop and disseminate information.
http://tbc.ce.cmu.edu/

Brownfield News.com provides information on brownfields in an effort to promote reuse.
http://www.brownfieldnews.com/

Brownfields.com, operated by American Restoration Resources, Inc., a nonprofit corporation, maintains an on-line searchable database where brownfields can be registered and marketed to potential buyers and developers.
http://www.brownfields.com

Brownfields Non-Profits Network is a network of nonprofit organizations helping to promote the redevelopment of brownfields throughout the U.S.
http://www.brownfieldsnet.org/

Center for Public Environmental Oversight (CPEO) promotes public participation in the oversight of environmental activities at federal facilities, private Superfund sites, and other brownfields.
http://www.cpeo.org/

ECS, Inc. provides risk management information for brownfield redevelopment projects.
http://www.ecsuw.com/default.htm; http://204.178.120.25/landreuse/index.htm

Environmental News Network (ENN) contains articles on brownfield redevelopment.
http://www.enn.com/

General Services Administration (GSA) 2001 homepage for its Brownfield Redevelopment Initiative to identify and redevelop underutilized federal brownfields.
http://bri.gsa.gov/brownfields/home/

Great Lakes Regional Online Brownfields Information Network (ROBIN) is an Internet clearinghouse for information about brownfield cleanup and redevelopment across the Great Lakes region of the U.S. and Canada. A product of the Council of Great Lakes Governors Brownfields Project, ROBIN was developed by the Great Lakes Commission to highlight the role of these states and provinces in the regional brownfields arena.
http://www.glc.org/robin/

Greenlining Institute promotes brownfield redevelopment in disadvantaged communities.
http://www.greenlining.org/pages/brownfields.html

HUD 2001 brownfields home page
http://www.hud.gov/bfields.cfm

International City/County Management Association (ICMA) seeks to strengthen the quality of local government through professional management. The ICMA promotes brownfield redevelopment through networking and information dissemination.
http://www.icma.org/go.cfm

Institute for Responsible Management is a nonprofit 501(c)(3) organization that charts and facilitates brownfield redevelopment. Its central focus is to support, work with, and help track the significance of the USEPA's Brownfields pilot projects.
http://instrm.org/whatsirm.htm

National Brownfields Association provides information on brownfields, runs annual National Deal Flow conferences, and facilitates the working of the national marketplace for brownfield redevelopment.
http://www.bfdealflow.com/bfdealflow/about.htm

National Center for Neighborhood and Brownfields Redevelopment, run from the E. J. Bloustein School of Planning and Public Policy at Rutgers University, offers research, education, and help for neighborhood brownfield redevelopment efforts.
http://www.policy.rutgers.edu/brownfields/

Northeast-Midwest Institute home page contains information on brownfield redevelopment including research papers by Institute staff.
http://www.nemw.org/brownfields.htm

$mart Growth Network works with the Sustainable Communities Network's (SCN) to provide information on brownfield redevelopment.
http://www.smartgrowth.org/

Roy F. Weston, Inc. brownfields page provides information on brownfield redevelopment.
http://www.rfweston.com/

U.S. Conference of Mayors 2001 home page which contains *Recycling America's Land: A National Report on Brownfields Redevelopment, Volume 3,* 2000.
http://www.usmayors.org/uscm/news/press_releases/documents/brownfields022400_final.asp

USEPA 2001 brownfields home page
http://www.epa.gov/ebtpages/cbrownfields.html

U.S. Office of Technology Assessment (OTA) 2001 home page which contains *The State of the States on Brownfields: Programs for Cleanup and Reuse of Contaminated Sites* (1995, Washington, DC: Congress of the United States).
http://www.wws.princeton.edu/~ota/ns20/year_f.html

Regional/state/local

USEPA Region 5 brownfields home page.
http://www.epa.gov/region5/

OEPA brownfields homepage.
http://www.epa.state.oh.us/oepa.html

Lucas County home page.
http://www.co.lucas.oh.us

Toledo-Lucas County Port Authority home page.
http://www.toledoportauthority.org/

City of Toledo home page.
http://www.ci.toledo.oh.us